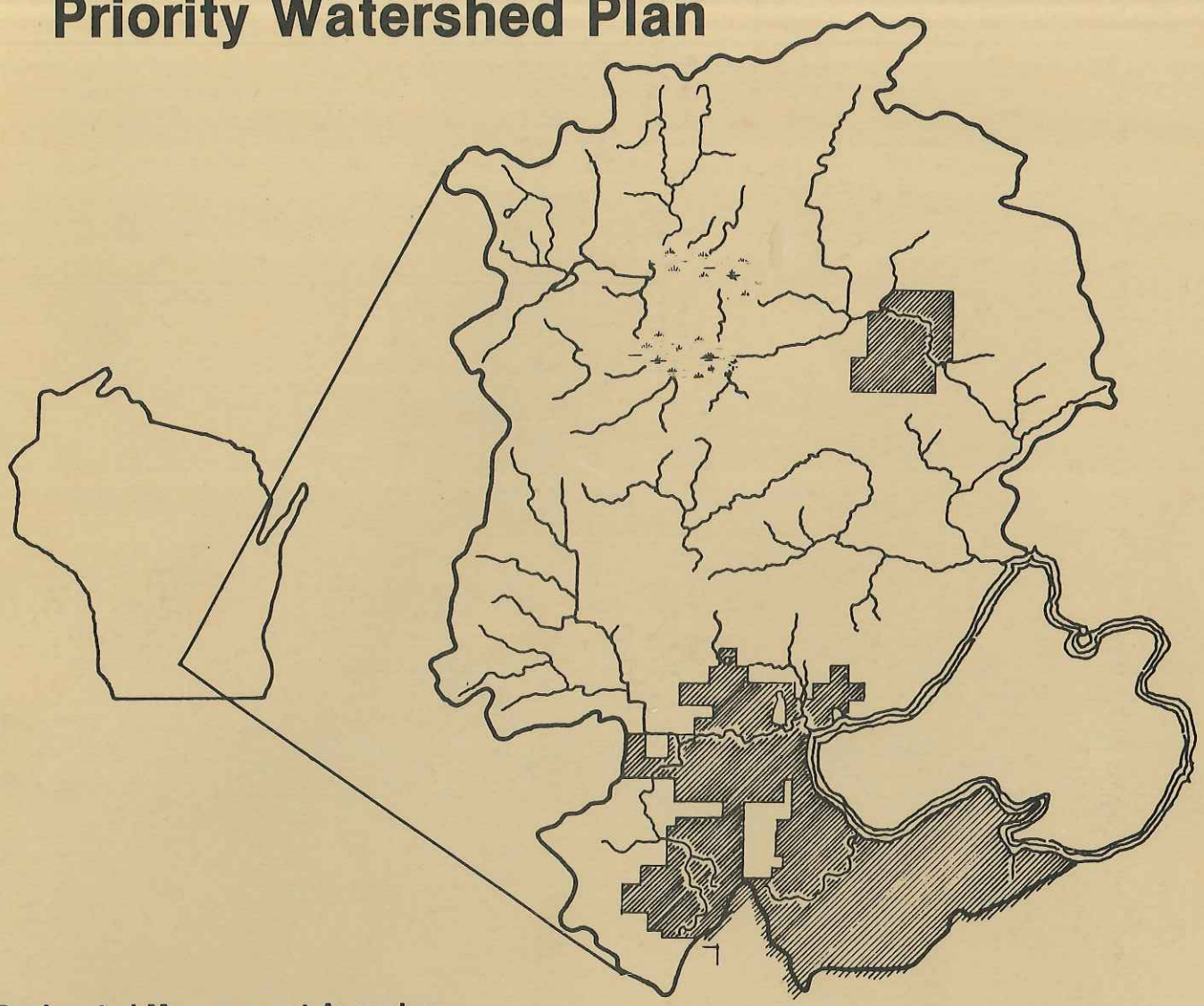
NPS LIBRARY COPY

Sixmile — Pheasant Branch Priority Watershed Plan



Designated Management Agencies

Dane County Soil and Water Conservation District
Dane County Board
City of Madison
City of Middleton
Village of Shorewood Hills
Village of Waunakee

Cooperating Agencies

Wisconsin Department of Natural Resources
Dane County Regional Planning Commission
U.S.D.A. Soil Conservation Service
U.S.D.A. Agricultural Stabilization and Conservation Service
University of Wisconsin-Extension
Wisconsin Board of Soil and Water Conservation Districts

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

- Stabilizing streambanks along Spring Harbor Creek and Pheasant Branch Creek in Madison and Middleton.

- Installing detention basins along Spring Harbor Creek in Madison to collect pollutants from urban areas and decrease downstream streambank erosion.

- Assessing the potential to increase infiltration of stormwater in existing urban areas by using downspout redirection, infiltration trenches, and porous pavement.

For developing lands -

- Developing and enacting adequate erosion and runoff controls programs for developing lands in Madison and Waunakee.

- Evaluating the need for improved erosion and runoff control in unincorporated areas.

- Constructing detention basins and grade stabilization structures in Madison along the South Fork of Pheasant Branch Creek and in Waunakee near Sixmile Creek to collect pollutants of the upstream urbanizing areas and protecting the downstream stream channels and banks.

- Protecting environmental corridors throughout the watershed.

The overall cost of the project is about $3,500,000. Based on cost-sharing rates of 50-70% and a 75% participation rate, about $1,600,000 will be granted from the Wisconsin Nonpoint Source Water Pollution Abatement Program. Participation is on a voluntary basis and land owner municipalities have three years to enter into cost-sharing agreements.

The project should achieve a 40 percent reduction in sediment to Lake Mendota if a high level of participation occurs in both urban and rural areas.

The Dane County Soil and Water Conservation District is the lead designated management agency or project coordination for the project. Each city also has project responsibilities. The Soil Conservation Service will assist the Soil and Water Conservation District in providing technical assistance to farmers. The University of Wisconsin-Extension will assist in educational activities in both urban and rural areas. The cities will be assisted by the Dane County Regional Planning Commission. Financial aid will be made from the Wisconsin Nonpoint Source Water Pollution Program to offset costs associated with technical assistance, educational activities, and fiscal management.

Project progress will be reviewed annually.

Table of Contents

Preface

Priority Watershed Plan: Technical Assessment and Actions Needed

Watershed Description 1

Water Quality Conditions 1

Water Quality Objectives 3

Sources of Sediment and Phosphorus 6

Recommended Watershed Actions 11

Summary of Costs 29

Expected Results 29

Program for Implementation

Introduction 30

Potential Funding 30

Designated Management Agencies 30

Implementation Schedule 32

Project Manager 33

Technical Assistance 35

Fiscal Management 37

Information and Education 39

Cost-sharing Agreements 41

Assessment Review 45

Annual Review and Audit 45

Appendices 46

Preface

In 1980, the Sixmile - Pheasant Branch Watershed was selected as a priority watershed under the Wisconsin (Fund) Nonpoint Source Water Pollution Abatement Program. Three other watersheds were selected in 1980 and five in 1979. The purpose of the program is to meet the national water quality goals set in 1972 by Public Law 92-500, Federal Water Pollution Control Act and detailed in the areawide water quality management (208) plans, by focusing financial and technical resources into watersheds where the water quality conditions are critical and pollution abatement is practicable. Nonpoint sources of pollutants include eroding streambanks, eroding croplands, eroding construction sites, runoff from city streets, and runoff from barnyards.

The Sixmile - Pheasant Branch Watershed was selected through a four step process. First, it was identified as having significant water quality problems and placed on a statewide list of about 80 watersheds. Secondly, the list was reviewed by nine regional committees and was the first of three watersheds recommended by the Dane County regional committee. Thirdly, the State Nonpoint Source Coordinating Committee, reviewed the regional recommendations and recommended four watersheds to the Department of Natural Resources (DNR). Finally, DNR selected Sixmile - Pheasant Branch Watershed.

The criteria used throughout the selection process include: the severity and the practicability of control of the water quality problems; the significance and impacts of the nonpoint sources contributing to the problems; practicability of controlling the nonpoint sources; demonstrated landowner and land user willingness to participate in the program; the capability and willingness of local agencies and units of government to participate; and the public use of the lakes and streams.

Upon selection of a priority watershed, funds are available to local agencies for preparation of a priority watershed plan in addition to assistance from DNR staff. Since the Wisconsin Legislature has directed DNR to use the priority watershed plans as applications for funding from appropriate federal programs, monies to implement the priority watershed plan may come from federal, state, or a combination of federal and state programs.

This priority watershed plan was prepared jointly by the Dane County Soil and Water Conservation District, the Dane County Regional Planning Commission, and DNR. The Dane County Soil and Water Conservation District performed the lead role in rural areas and the Dane County Regional Planning Commission took the lead within the urban service areas. Assistance was provided by the City of Madison, City of Middleton, Village of Shorewood Hills, Village of Waunakee, Soil Conservation Service, University of Wisconsin Extension, and a number of other federal agencies and county departments.

The priority watershed plan that follows has two parts. The first part is a technical assessment of water quality problems, the nonpoint sources contributing to the problems, and an identification of actions needed to minimize the water quality problem. This first part meets the watershed plan requirements of NR 120, Wisconsin Administrative Code. The second part is called the Program for Implementation in NR 120, Wisconsin Administrative Code. It identifies tasks necessary to carry out the necessary actions identified in the first part, agencies responsible for carrying out the tasks, a schedule for carrying out the tasks, and the kind and amount of staff resources needed to carry out the tasks.

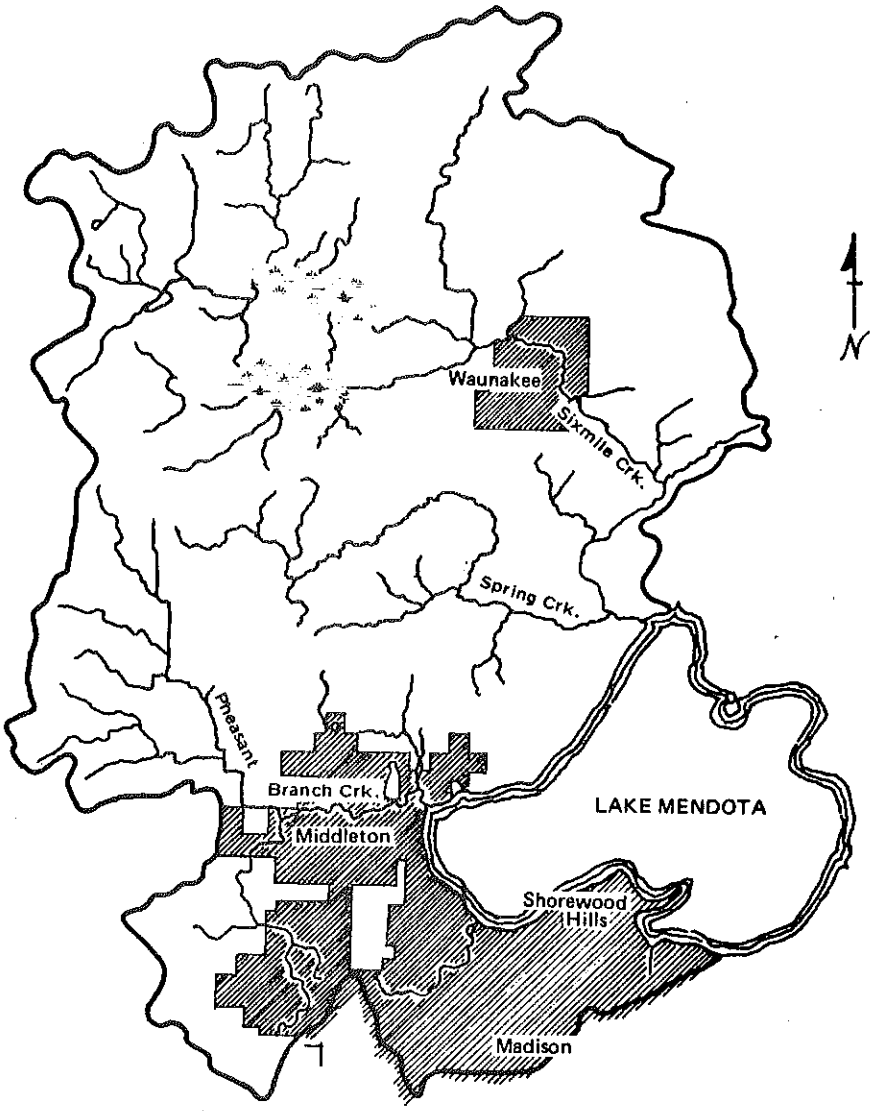


Figure 1. Sixmile-Pheasant Branch Watershed.

PRIORITY WATERSHED PLAN: TECHNICAL ASSESSMENT AND ACTIONS NEEDED

Watershed Description

The Sixmile - Pheasant Branch Watershed is located in the north central portion of Dane County and is part of the Yahara River system and Rock River Basin. It is approximately 92 square miles (59,000 acres) and constitutes about 45% of the drainage area to Lake Mendota. About 20 square miles are in urban land use with the remainder primarily in agricultural use. The 1980 population in the urban areas was approximately 57,000. The watershed is actually four major and adjacent drainage areas all draining to the lake: Sixmile Creek, Pheasant Branch Creek, Spring Harbor Creek and Willow Creek drainage areas (See Figure 1).

Sixmile Creek drainage area is the largest of the four and is located to the northwest of Lake Mendota. Its main water resources are Sixmile Creek, Waunakee Marsh and Spring Creek. For purposes of this assessment, it has been divided into three sub-watersheds: Above Waunakee Marsh; Below Waunakee Marsh; and Spring Creek.

The subwatershed Above Waunakee Marsh has moderate to very steep slopes bordering on series of wetlands. Some of the lands along the perimeter of the watershed drain to depressions (internally drained) and do not contribute runoff to Sixmile Creek. The primary land use is dairy farming and much of the land is in crop rotation, pasture, or woodlot. A number of large livestock operations are located immediately adjacent to Sixmile Creek.

The slopes of the subwatershed below Waunakee Marsh vary from shallow to steep. Some of the area is internally drained. It has a mixture of land uses: dairy farming, cash grain farming, existing urban and developing urban. The Village of Waunakee (1980 population 3,866) is located adjacent to Sixmile Creek a short distance downstream from the outlet of Waunakee Marsh. It has experienced significant growth (77% increased between 1970 and 1980) during the last decade. The village owns a substantial amount of parkland along Sixmile Creek and intends to extend the parkland in the future.

The slopes of lands draining to Spring Creek range from moderate to very steep in the stream's headwaters and decrease as the stream flows east towards Sixmile Creek. There are extensive wetlands along the stream near its mouth. The land use is a mixture of dairy farming and cash grain farming. A number of large livestock operations are located immediately adjacent to Spring Creek.

Pheasant Branch Creek enters Lake Mendota from the west within the City of Middleton. Its drainage area has been divided into four subwatersheds for purposes of discussion and assessment: North Fork, South Fork, Main Stem, and Lower.

The North Fork Pheasant Branch subwatershed has steep slopes in its headwaters region and shallower slopes as it approaches the City of Middleton. Several areas within the subwatershed are internally drained. The land use is a mixture of dairy and cash grain farming. A small amount of the land in cash grain farming is being held for speculative purposes in anticipation of urban development.

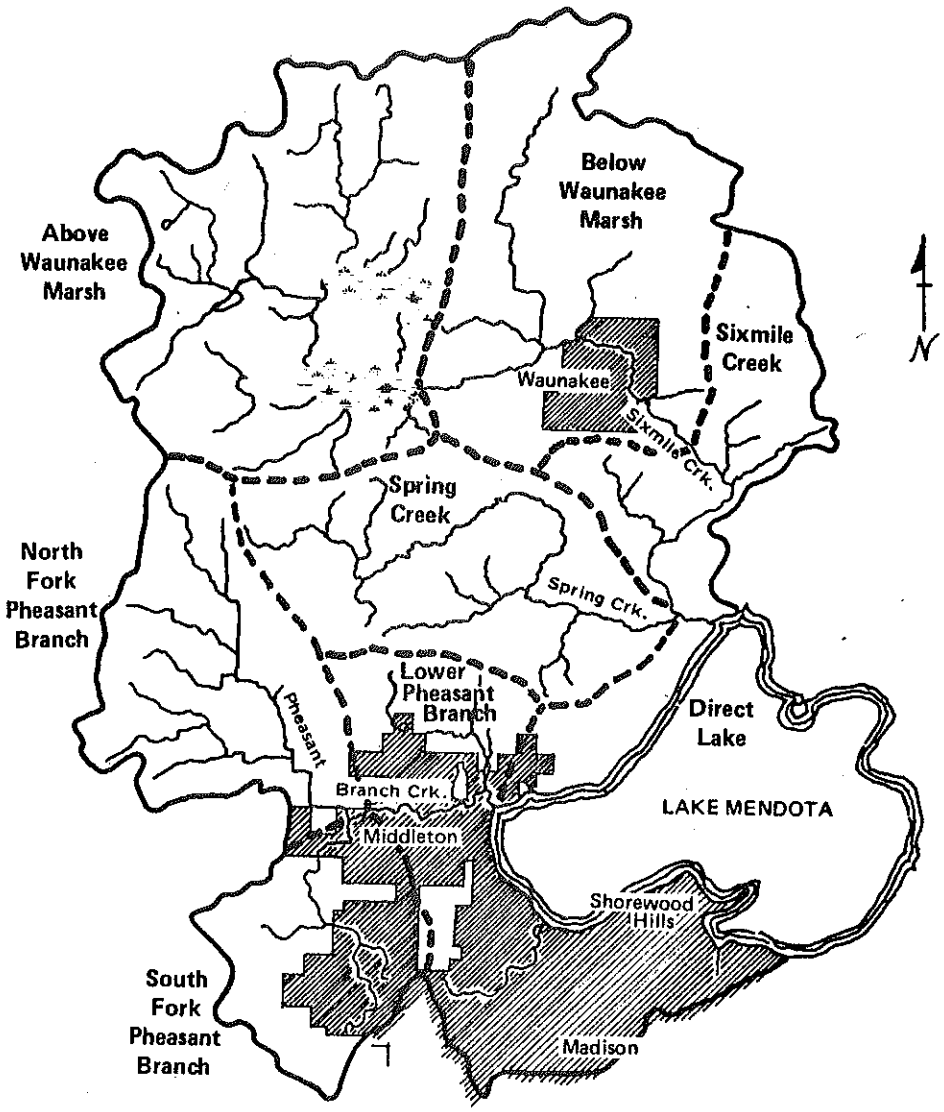


Figure 2. Sixmile-Pheasant Branch Watershed, Rural Subwatersheds.

The South Fork Pheasant Branch subwatershed originates in the rapidly urbanizing southwest side of Madison near Mineral Point Road and the Beltline Highway (U.S.H. 12 and 14). South of Mineral Point Road the ongoing development is entirely commercial. North of this road the ongoing development is primarily medium density residential. The area further downstream is still agricultural; corn grown year after year on moderate to steep slopes. Much of this land is being held for speculation purposes and much will be developed within the next five years - especially east that portion of the Beltline Highway and within the locally adopted "Urban Service Area."

Two large non-contributing areas border the South Fork Pheasant Branch Creek subwatershed boundary within the Madison-Middleton area. The largest of the non-contributing areas is 950 acres in size, and drains to two shallow ponds known as Stricker's Pond and Tiedeman's Pond. The Stricker's-Tiedeman's Pond area has seen rapid development in recent years, and with this development have come problems of rapid increases in runoff and excessive sedimentation. Although the Stricker's-Tiedeman's Pond Watershed is currently non-contributing, significant increases in runoff from new development have raised water levels in the ponds, giving rise to the concern of providing a future outlet which would be directed to Lake Mendota. The Cities of Middleton and Madison are currently studying the Stricker's-Tiedeman's Pond drainage area to determine the hydrology of the area and to model the impacts of anticipated development. As shown on the map entitled "Urban Study Area" the Esser Pond drainage area (30-19),the second non-contributing area (206 acres in size), abuts the Stricker's-Tiedeman's Pond area on the northeast. Development is just beginning to occur in the Esser's Pond drainage area.

The area around the confluence of the North and South Forks of Pheasant Branch bounded by Highway 12 on the east and Highway 14 on the south, is an area of unique character. Portions of this land were at one time contained in Dane County farm drainage district #6, which was created for the purpose of draining the excessively wet organic soils found in this area. This broad, flat area was the site of old glacial Lake Middleton, and contained a large expanse of wetland with poorly defined drainage. This area was ditched, channelized and drain tiled in 1921, and the stormwater storage benefits associated with the marshy area were lost. The channel modificatons undertaken by the drainage district significantly increased the discharge rates and volumes of runoff passing through the reach of Pheasant Branch Creek within the city limits of Middleton. The potential for additional urban development in the North Fork-South Fork Junction area appears limited, primarily due to soils conditions and the extent of the 100-year floodplain in this area. Ordinarily, broad, flat areas such as this would generate little runoff and would be of little concern with respect to watershed management planning. However, the fact that much of this land is drain tiled and the nature of the land uses (row crop agriculture, nurseries, and sod farms) indicate the potential for the generation of significant nutrients.

The main stem of Pheasant Branch Creek is almost entirely within the City of Middleton. The stream has been impacted by the drainage work which occurred upstream in the old glacial Lake Middleton area. The Pheasant Branch Creek channel is still extremely young, and in a constant state of change. The slopes of the stream valley are generally very steep, and the native material consists mainly of fine grained sands which are extremely erodible. This reach of the creek has long been a source of concern and expense for the residents of Middleton due to the unstable banks, the steep channel gradients, the excessive peak flood flows and large amounts of sediment which are transported through the system with subsequent deposition in the downstream marsh areas and Lake Mendota. Considerable effort has been expended in bank stabilization, channel realignment and dredging. The areas which drain to Pheasant Branch Creek within Middleton are generally developed and stable. There appears to be little construction activity of consequence.