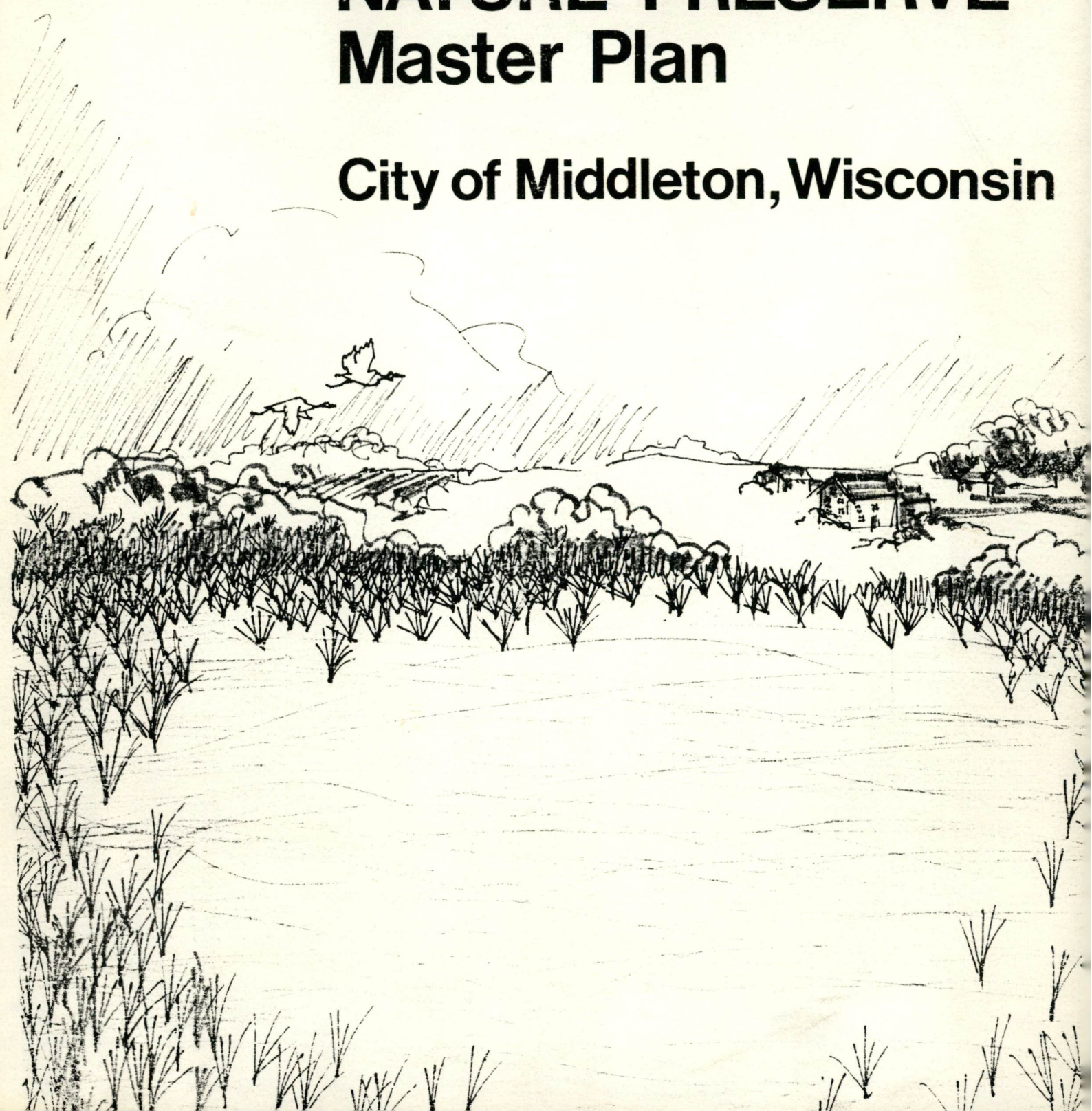


Jim M.

PHEASANT BRANCH NATURE PRESERVE Master Plan

City of Middleton, Wisconsin



MASTER PLAN
PHEASANT BRANCH NATURE PRESERVE
CITY OF MIDDLETON, WISCONSIN

June 1982

Prepared By
Stockham & Vandewalle



(608) 831-4114

April 5, 1982

Mayor Dan Ramsey
City of Middleton
7426 Hubbard Avenue
Middleton, Wisconsin 53562

Dear Mayor Ramsey:

Enclosed herein is a copy of the Master Plan for the Pheasant Branch Nature Preserve. The plan has been prepared by the Park, Recreation and Forestry Commission working with the planning consulting firm of Stockham & Vandewalle.

The Pheasant Branch Nature Preserve is a valuable and unique resource for the City of Middleton. This outstanding natural area functions as a recreational resource, a natural laboratory, and as a major element of the City's water resources management program. As the City continues to grow it will be increasingly important to preserve and enhance this area for all of its values and multiple management objectives.

With this plan, the Park, Recreation and Forestry Commission believes we have set a course for continuing and expanding the program which has preserved this valuable natural resource for our citizens. We recommend that the City of Middleton adopt this plan and proceed with the orderly implementation of the recommendations described herein.

Sincerely,

Howard Teal
Chairman
Park, Recreation and
Forestry Commission

JS /kl

Enclosure

MIDDLETON, WISCONSIN 53562

7426 HUBBARD AVENUE

CITY OF MIDDLETON



PHEASANT BRANCH MARSH



CONTENTS

	<u>Page</u>
I. INTRODUCTION.....	1
II. GENERAL PLANNING OBJECTIVES AND POLICIES.....	2
III. DESCRIPTION OF THE NATURE PRESERVE	4
A. Description of the Land Area.....	4
B. Topography and Landforms.....	4
C. Floodplain.....	7
D. Hydrologic History	9
E. Vegetation and Ground Cover	11
IV. DESCRIPTION OF DEVELOPMENT SURROUNDING THE PHEASANT BRANCH NATURE PRESERVE	16
V. WATERSHED MANAGEMENT PROGRAMS AFFECTING THE PHEASANT BRANCH NATURE PRESERVE.....	19
VI. NARRATIVE DESCRIPTION OF THE PHEASANT BRANCH PRESERVE MASTER PLAN	25
VII. RECOMMENDED LAND ACQUISITIONS.....	30
VIII. RECOMMENDED TEN YEAR CAPITAL IMPROVEMENT PROGRAM	31
IX. MANAGEMENT RECOMMENDATIONS.....	32
Appendix A. Report from Warzyn Engineering, Inc. Re: Bridges and Boardwalk at Pheasant Branch Nature Preserve	

Note: The Master Plan map is folded within the envelope at the end of this report.

I. INTRODUCTION

The Pheasant Branch Nature Preserve Plan is a direct outgrowth of the Park and Open Space Plan (Stockham & Vandewalle) approved by the Park, Recreation and Forestry Commission in February, 1982. This Plan is one of three park and conservancy area master plans being prepared at this time by the City of Middleton.

The Pheasant Branch Nature Preserve is an outstanding natural resource which serves not only the residents of Middleton, but also should be considered a site of regional significance. The marsh is a remarkably high quality wetlands within an urban setting. The wetland area is a popular birding site for both migrating and year-around waterfowl. The upland woods surrounding the marsh and stream are largest expanse of woods on the west side of Madison.

The City of Middleton has committed a tremendous amount of its resources toward the acquisition and preservation of this area. This Plan represents a continuation of that commitment.

In general this Plan is consistent with most of the findings and proposals of the Pheasant Branch Marsh Environment Study (D'Onofrio, Kottke and Assoc., Inc.) prepared in 1973. The philosophy of management and the general objectives and policies for management of the area have remained constant. The major modifications from the 1973 Study are adjustments in the acquisition and development program phasing in light of current fiscal constraints; adjustment in the trail loop design to provide near-future access to the area acquired to date; and greater detailing of specific structural improvements.

This Plan provides for interim access and utilization of the conservancy area without the full acquisitions anticipated in the 1973 Study. The earlier proposed acquisitions remain long-term objectives but the timing of the acquisitions may be delayed due to fiscal constraints.

II. GENERAL PLANNING OBJECTIVES AND POLICIES

The following objectives and policies represent a continuation of the general philosophy of preserving the Pheasant Branch Nature Preserve as a natural resource for the City of Middleton.

Objectives

- 1) Maintain a multiple-objective management policy of utilizing the conservancy area for both water quality control and its ecological and recreational values;
- 2) Provide for the preservation of open space to maintain the habitat for wildlife in the marsh, the adjacent uplands, and the upstream shoreline areas;
- 3) Provide a passive recreational resource for the community consistent with the objective of maintaining the ecological and water resource management values of the area;
- 4) Enhance and expand the trail system as a pedestrian linkage through the City providing a highly aesthetic natural walkway linking many of the neighborhoods with shopping, work and educational facilities;
- 5) Preserve and enhance water quality in Lake Mendota;
- 6) Provide appropriate vehicular access to overlooks and vistas for the elderly and handicapped;
- 7) Provide an "environmental laboratory" for instructing school groups and individuals on ecological principles and environmental sciences;
- 8) Enhance the aesthetic environment of neighborhoods abutting the conservancy area.

Policies

- 1) The City shall continue its policy of utilizing available State and Federal matching funds for the implementation of the acquisition program.
- 2) No portion of the conservancy area other than designated roadways and parking areas shall be accessible by motorized vehicles other than maintenance vehicles of the City.
- 3) Phased construction of the trail system shall be implemented to provide short-term access to the area already in public ownership. Expanded trail system development shall occur as new parcels are acquired.

- 4) Human encroachment in the central part of marsh shall be discouraged in order to preserve a "near pristine" wildlife habitat;
- 5) The City should take advantage of opportunities to acquire street frontage access to the conservancy area along Century Avenue;
- 6) In reviewing plats and development proposals for adjacent private development, the City should require ample pedestrian and bicycle access to the conservancy area;
- 7) Any future reconstruction of the Pheasant Branch Creek bridge on Century Avenue or the culverts at U.S. Highway 12 should provide for under the street pathways providing a continuous pedestrian linkage along the creek for its entire length through the City;
- 8) Trapping and hunting should be allowed only by permit from the City for the purposes of wildlife management;
- 9) The schools and other groups should be encouraged to participate in research and management of the conservancy area as a function of the educational role of the conservancy area;
- 10) Community groups and schools should be encouraged to assist in the construction and maintenance of trails. Such assistance should be supervised by appropriate City staff. (Note: Any new trails should be designated by a trained naturalist or park planner to protect sensitive habitat and ecological areas.
- 11) Users of the conservancy area should be encouraged to utilize the designated trail system. A limited amount of off-trail use is acceptable, but such use should be restricted to non-wetlands and non-erodible areas;
- 12) Work with Dane County and the City of Madison to require upland stormwater and erosion control management to reduce siltation of marsh;
- 13) Require adjoining development to be designed and constructed with materials, scale and massing that blend with natural setting as viewed from the marsh.

III. DESCRIPTION OF THE NATURE PRESERVE

A. Description of the Land Area

The Pheasant Branch Nature Preserve consists of approximately 300 acres of City-controlled land between U.S. Highway 12 and the mouth of Pheasant Branch Creek. In addition to the acreage presently owned or leased by the City, an additional 200 acres at the north end of Pheasant Branch Marsh are proposed for future acquisition.

The Nature Preserve is divisible into two clearly distinct management areas. The linearly shaped section between U.S. Highway 12 and Century Avenue consists of the ravine of the main stem of Pheasant Branch Creek. This area has been improved with an outstanding linear trail system linking several parks and schools. The trail is heavily used by hikers, joggers, casual strollers, and educational groups.

The portion of the Nature Preserve north of Century Avenue includes a large lowland woods and the southern half of Pheasant Branch Marsh. This area has a partially improved trail system but is mostly unimproved and only lightly used. The marsh area can be entered from several points on all directions, but none of the entrances are fully improved with adequate parking or signage.

B. Topography and Landforms

Pheasant Branch Creek, a tributary to Lake Mendota at Middleton, drains an area of 23.1 square miles consisting of gently rolling morainal hills formed from glacial till. The south fork drainage area extends for approximately three (3) miles south of Middleton to Mineral Point Road and includes areas within the City of Madison characterized by rapid development. This development has sharply aggravated peak velocities,

sedimentation and water quality problems in the creek and the marsh system. The north fork drainage extends north of Middleton for approximately six miles and includes large portions of the Towns of Springfield and Westport. The north fork is characterized by urban-fringe farming. There are many critical agricultural related upland watershed management problems in the north-fork drainage area.

Figure 1 on the following page is a map of the entire watershed. The main stem of Pheasant Branch Creek, as it passes through the City of Middleton, is a relatively young channel and is in a constant state of change. Between U.S. Highway 12 and Century Avenue the creek flows through a steeply sloped ravine. The soil materials within the ravine consist of finely grained sand which is extremely erodible. This reach of the creek has long been a source of concern and expense for the City and residents bordering the creek due to the unstable banks, the steep channel gradients, the excessive peak flood flows, and the large amount of sediment which is transported through the system. Considerable effort has been expended on bank stabilization, channel realignment and dredging.

North of Century Avenue, the creek flows approximately 2,800 feet along a well-defined channel before broadening into Pheasant Branch Marsh. The marsh itself consists of 311 acres of lowland. In addition to water entering the marsh via the stream channel, the marsh is fed by major springs located at the base of Frederick's Hill (located due north of the marsh). The springs are among the largest in Dane County and represent a unique example of a high volume natural spring.

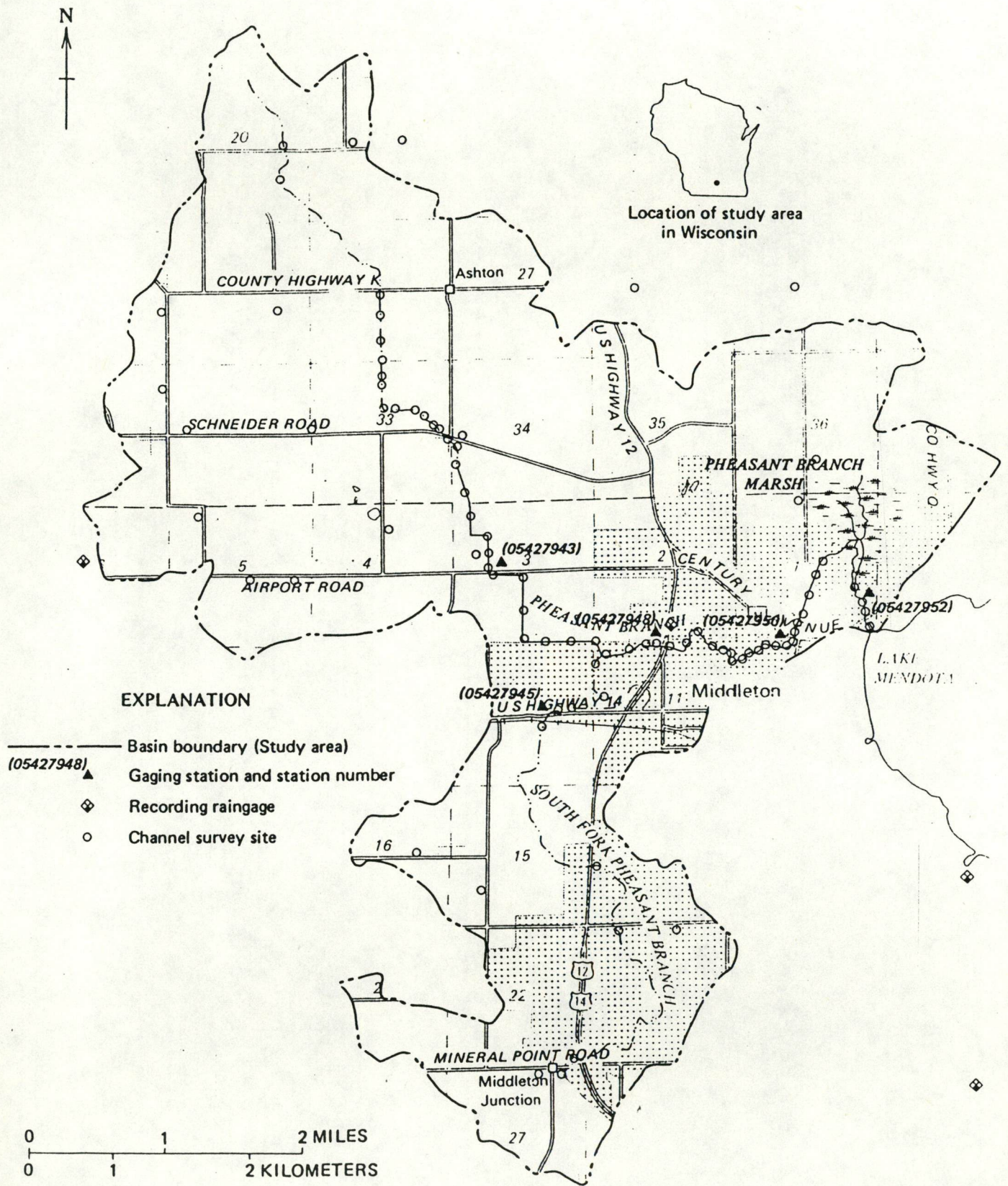


Figure 1. Location of study area, gaging stations, rain gages, and channel-survey sites.



Pheasant Branch Marsh Springs

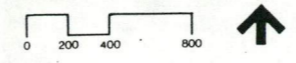
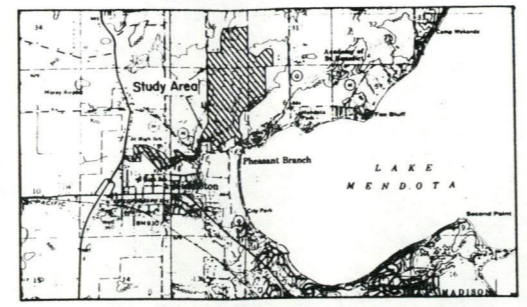
The marsh is bounded on the west and east by moderately to steeply sloped uplands. At the present time most of the contributory uplands are in natural vegetation; however, extensive development is anticipated in the relatively near future. Fredrick's Hill, located at the north end of the marsh, is the dominant landmark. The hill has an elevation of 1045 feet and sits 200 feet above the marsh. From the marsh the creek flows due south into a delta at Lake Mendota.

C. Floodplain

The floodplain of Pheasant Branch Creek has been mapped by U.S.G.S. for the National Flood Insurance Program. The floodplain includes the stream channel portion of the ravine and all of the wetlands in the marsh area. Figure 2 on the following page shows the 100-year floodplain.

PHEASANT BRANCH CONSERVANCY AREA



City of Middleton, Wisconsin

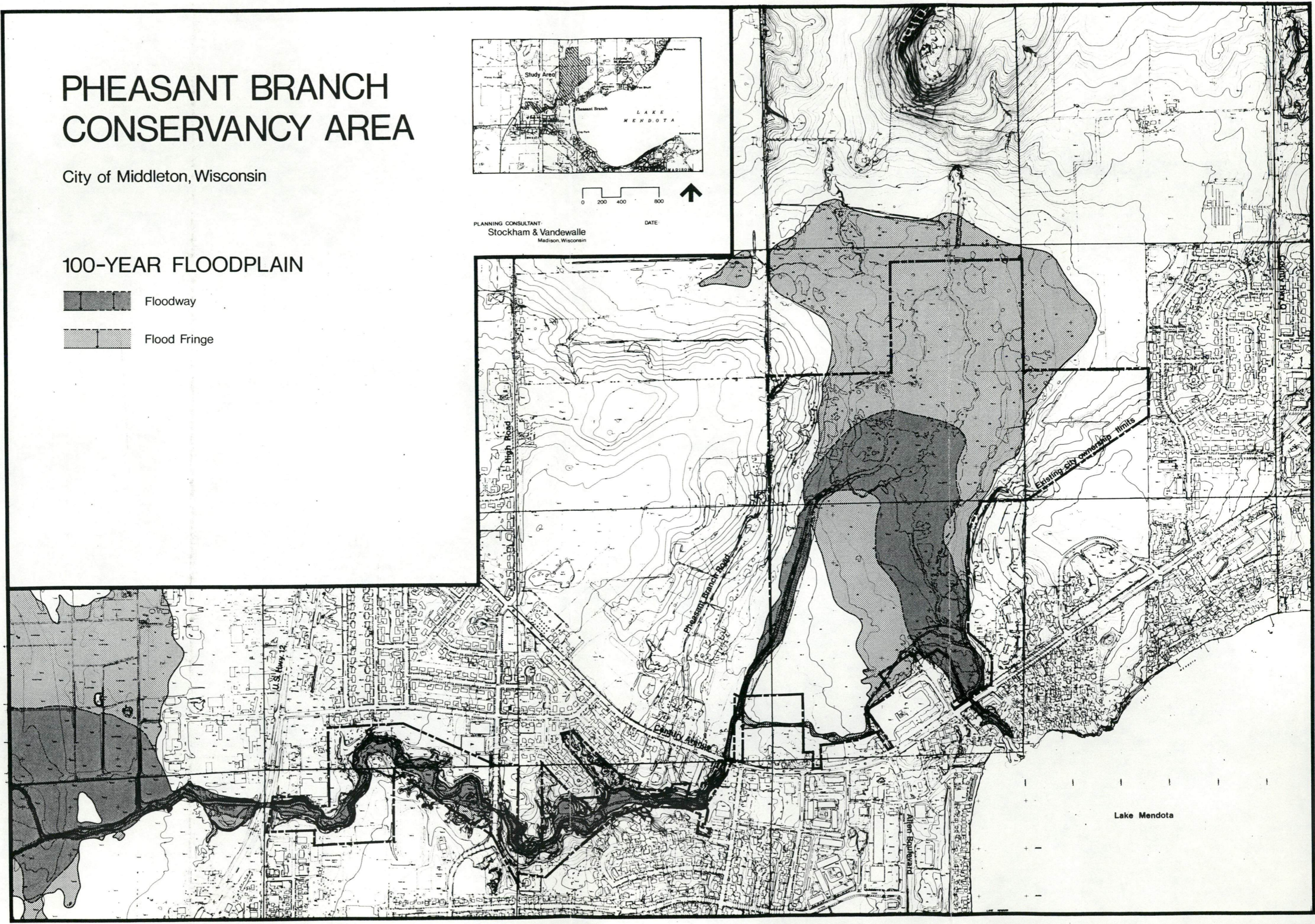


PLANNING CONSULTANT:
Stockham & Vandewalle
Madison, Wisconsin

DATE:

100-YEAR FLOODPLAIN

-  Floodway
-  Flood Fringe



Existing city ownership limits

Lake Mendota

D. Hydrologic History

The entire Pheasant Branch watershed is characterized by gently rolling uplands with interspersed lowland marshy areas drained by the Pheasant Branch drainage. The junction of the south fork and the north fork west of U.S. Highway 12 was the former lakebed for glacial Lake Middleton. The main stem meanders eastwardly from the Lake Middleton area through the ravine to the marsh and thence into Lake Mendota.

The drainage has been subject to extensive man-caused modification. Beginning around 1900, the lowland marshy areas within the watershed were drained by the construction of artificial drainage channels to benefit agriculture. In the 1920's a farm drainage district was formed to ditch, channelize and drain the broad marshy area which was the former lakebed of glacial Lake Middleton. The channel modifications undertaken by the drainage district significantly increased the discharge rates and volumes of runoff passing through Pheasant Branch Creek reaches within the City of Middleton.

Within the lower reaches of the main stem which flows through the Nature Preserve, there has been extensive hydrologic modification attributable to both natural conditions and man-caused activities within the watershed. The natural ravine through which the creek flows is characterized by steep slopes consisting of native parent material of fine grained sands which are extremely erodible. The watershed gradient in this reach is 23.3 feet per mile. Under natural conditions the channel would shift alignment by erosion and rebuilding the banks. Although meandering would continue, over time an equilibrium would be established

in regard to amount of natural sediment entering the reach and leaving the reach.

In Pheasant Branch Creek the amount of both sediment and the volume and velocity of flow entering the lower reaches has been heavily modified by upstream agricultural practices and urbanization. Within the ravine further hydrologic modification has occurred as a result of streambank stabilization and other construction which has restricted the natural meandering tendencies of the creek. Although aesthetically and economically necessary, the program of extensive streambank stabilization in the reach between U.S. Highway 12 and Century Avenue has committed the City to a program of continuous further expenditure to protect existing structures and development. The present policy of the Water Resources Committee is to continue to construct streambank improvements and sediment accumulation structures to control gradient changes. These improvements are considered necessary to protect already existing improvements.

North of Century Avenue the creek channel has been recently modified by both man-caused and natural changes. Before 1950, Pheasant Branch Creek flowed from the west through Pheasant Branch Marsh and thence into Lake Mendota. During the 1950's, the creek changed its course, bypassing the marsh and flowing eastwardly from a point approximately 400 feet downstream from the Century Avenue bridge. The gradient and the velocity was sharply increased by this cutoff, resulting in the formation of a silty delta at the mouth of Pheasant Branch Creek.

In 1967 the Middleton Lakeshore Problems Commission published recommendations on how to solve Middleton's erosion and sedimentation problems. The report of the Commission suggested relocation of creek

and channelization by construction of a levee to redirect the flow into the marsh, thus reducing the gradient and providing an opportunity for sedimentation prior to the creek entering Lake Mendota. These improvements were made in 1970 and 1971.

Today, the trail into Pheasant Branch Marsh follows the man-made levee built to rechannelize the creek. The former creek bed which bypassed the marsh can still be seen. North at Century Avenue the creek is trying to meander from its man-made channel as it is rapidly cutting into the man-made banks north of the former cut-off. If left uncontrolled, it is possible that the creek would again establish a new channel and bypass the marsh. The City is presently investigating streambank improvements to reduce the cutting due to the natural meandering tendencies of the creek.

Within the marsh the creek gradient drops to only 3 feet per mile. At the upstream entrance to the marsh the creek is rapidly forming a delta caused by the heavy sediment loads carried from upstream. As the creek enters the reach with lower gradient and hence lower velocity, the sediment load is deposited. This build up is rapidly degrading the character of the marsh and the lowland forest.

Further within the marsh there are areas of open water formed by the combined water volumes from the creek and the springs at the base of Frederick's Hill. Within this area the water quality and the condition of marsh vegetation is good. The eastern fringes of the marsh adjacent to urban development are threatened by the incremental sedimentation and filling due to erosion and runoff from the upland development.

E. VEGETATION AND GROUND COVER

Within the study area ten identifiable ground cover groupings are recognized. Five of the general vegetation groupings are low, wetland

communities found within the marsh. The undeveloped uplands surrounding the marsh are upland abandoned fields, upland forest, grazed pasture land and cultivated land. The vegetation within the ravine portion of the Nature Preserve is primarily upland and lowland forest within the ravine surrounded by developed land with mowed lawns or athletic fields. The land to the west of U.S. Highway 12 is mostly cultivated into rowcrops or nursery stock. Figure 3 on the following page indicates the ground cover groupings.

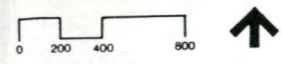
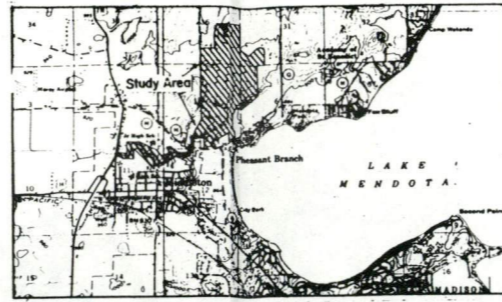
The wetland communities within the marsh are the emergent vegetation community characterized by burr weed in dense stands and wild rice in open water areas; mixed emergent vegetation characterized primarily by sedges; sedge meadow; wetland shrubs characterized by willows and red-ossier dogwood; and the wetland disturbance vegetation community, characterized by dense patches of reed canary grass and giant ragweed.

In 1974 at the time of the last comprehensive survey of vegetation in the marsh the authors of the Wetlands of Dane County, Wisconsin (Bedford, Zimmerman and Zimmerman) made the following observations about the general quality of marsh vegetation:

In spite of the heavy siltation which has occurred in the marsh, the diversity of submerged aquatic vegetation is good, not being limited to or dominated by two or three species. However, the almost complete dominance of burr weed in a large area north of the pond suggests that the silt deposits have diminished the diversity of emergent vegetation in that marsh. Excessive duckweed choking the open water during late summer serves as a warning against further flow of nutrients into the marsh.

PHEASANT BRANCH CONSERVANCY AREA

City of Middleton, Wisconsin

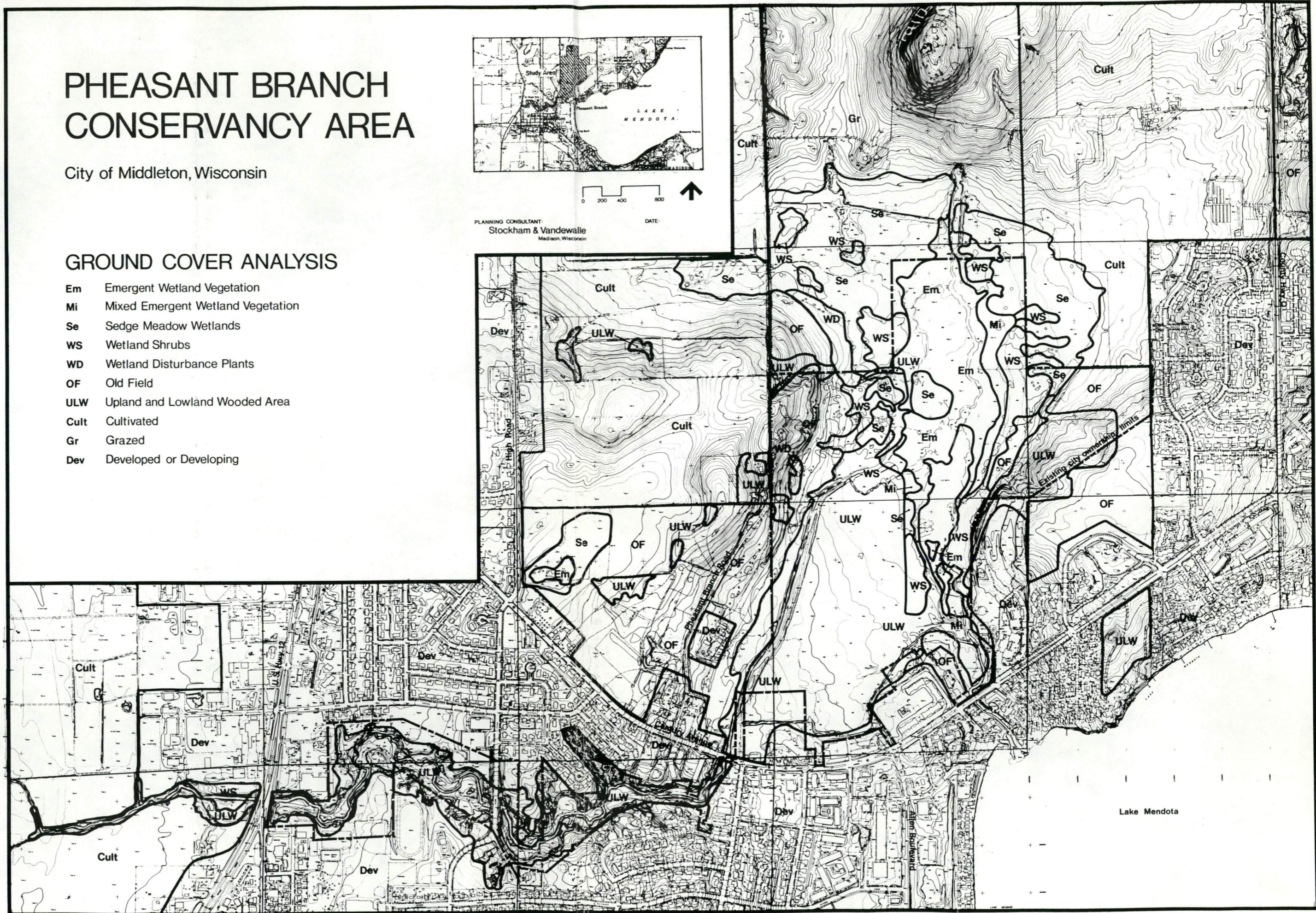


PLANNING CONSULTANT:
Stockham & Vandewalle
Madison, Wisconsin

DATE:

GROUND COVER ANALYSIS

- Em Emergent Wetland Vegetation
- Mi Mixed Emergent Wetland Vegetation
- Se Sedge Meadow Wetlands
- WS Wetland Shrubs
- WD Wetland Disturbance Plants
- OF Old Field
- ULW Upland and Lowland Wooded Area
- Cult Cultivated
- Gr Grazed
- Dev Developed or Developing



In 1981, most of these observations are still appropriate; however, extensive degradation around the edges of the marsh due to sedimentation has reduced the area of high quality vegetation. The sedimentation problems are most severe at the delta where the creek enters the marsh. Some sedimentation also appears to be occurring on the east side of the marsh where upland development is occurring.

The forested and other uplands area surrounding the marsh include several distinctly different communities. The lowland forest area north of Century Avenue is mostly black willow. Although disturbed and of generally marginal quality, the size of area, its remoteness from human activity, and its proximity to water make this a valuable wildlife area. It is the largest forested area within the City of Middleton. The publicly-owned upland oak-hickory forest on the hillside east of the marsh and north of the proposed Wood Creek Development is a high quality mature stand of mixed hardwoods. This small forest is of extreme importance to the Nature Preserve due to its diversity and natural condition.

The abandoned fields with scattered groups of shrubs and occasional trees surrounding most of the marsh are valuable for wildlife usage and for buffering the marsh. Most wildlife in the Nature Preserve thrive in "edge" areas surrounding the abandoned fields. The open and semi-open fields also provide numerous outstanding vistas for observing the marsh.

Frederick's Hill, located north of the marsh and still in private ownership, contains some native prairie vegetation. Ideally, this steep, dry hill will be acquired as part of the Nature Preserve and will provide

an upland natural habitat and vista area. The hill also drains directly into the spring and the vegetation should be maintained to help protect the springs and the north end of the marsh from further degradation due to sedimentation.

IV. DESCRIPTION OF DEVELOPMENT SURROUNDING THE PHEASANT BRANCH NATURE PRESERVE

The Pheasant Branch Nature Preserve is a unique natural area in the midst of a rapidly urbanizing portion of the Madison metropolitan area. During the next twenty years the population of Middleton will probably increase from its present figure of approximately 12,000 to 15,000 to 19,000. Much of the undeveloped land surrounding the Nature Preserve is "in the path of development." The uplands within the watershed, particularly the South Fork, will be developing rapidly over the next decade. This development poses immediate water resource management concerns in terms of the velocity and volume of stormwater runoff and possibly degraded water quality entering the conservancy area.

Figure 4 on the following page shows the land within the study area which is already developed or partially developed.

Most of the land surrounding the ravine portion of the Nature Preserve is fully developed with relatively stabilized ground cover and runoff patterns. Most of the undeveloped land bordering the Nature Preserve has had preliminary plans for development or is zoned for development. The partially developed industrial and agricultural land immediately west of U.S. Highway 12 is likely to develop in the next decade. The proposed Middleton Industrial and Research Park includes over 300 acres extending from U.S. Highway 12 westward to the Golf Green Industrial Park. The entire 300 acres is being rezoned as Planned Development Community (PCD) in preparation for industrial park development.

The undeveloped uplands north of Century Avenue between High Road and Pheasant Branch Road (Marshall Erdman Property) are zoned R-1; however, based on current market trends it is possible that higher density

housing may be proposed for this area. Much of this land drains directly in to the Nature Preserve. Aesthetically, development of this property will have an impact on the Nature Preserve because of the views from the marsh and the east side of the concervancy area.

The parcel of land fronting on Century Avenue immediately east of the Century Avenue Bridge (Sieger Property) is zoned R-1 and platted for single family. Several alternative development proposals have been submitted for this parcel. Because of the public value of the Century Avenue frontage for the Nature Preserve and the values of preserving the lowland woods, it is recommended that the City acquire this area. (Note: See description of the acquisition proposal on pages 27 and 28.

The Wood Creek Development east of the marsh is presently under construction. The entire site has been cleared and scarified for imminent development into medium density townhouses. Additional medium density development is proposed for the Greater Highlands Plat located immediately east of Wood Creek. These combined development areas will add an additional 200 to 320 dwelling units of housing immediately adjacent to the Nature Preserve. The City has long-term plans to construct a high volume elevated water reservoir at the north end of the Greater Highlands.

The undeveloped land contiguous to the Nature Preserve north of the City of Middleton is not expected to develop within the next decade. These lands do not have public water and sewer utilities. The biggest threat to the Nature Preserve from these parcels comes in the form of isolated low density development which could preclude future public acquisition.

V. WATERSHED MANAGEMENT PROGRAMS AFFECTING THE PHEASANT BRANCH NATURE PRESERVE

There are numerous previous and on-going studies of the Pheasant Branch watershed which may have an impact on the recreational management of the Nature Preserve.

A. Pheasant Branch Marsh Environmental Study (1973)

The Pheasant Branch Marsh Environmental Study (D'Onofrio, Kottke & Assoc., 1973) established the basic management tenets and acquisition program for the marsh portion of the Nature Preserve. This study established the multi-objective management policies for maintaining the marsh as both a recreational/ecological resource and as a sediment and nutrient filter for Pheasant Branch Creek and other minor tributaries. The basic recommendations the D'Onofrio study remain appropriate; however, the rate of implementation of the acquisition program and several of the specific structural recommendations have been modified. In addition, the degradation which has occurred in the marsh over the past ten years suggests a greater reliance on upland watershed management with less dependence on the marsh serving as a sediment and nutrient filter.

Specifically, the marsh will continue to function as a sediment and nutrient filter but greater emphasis needs to be placed on upland management to arrest sediments and nutrients before they enter the drainage system. Construction of upstream detention basins has been recommended in most subsequent studies and is in fact required in many development situations by the Municipal Code Relating to Erosion Control and Storm Water Runoff (City of Middleton Ordinances, Chapter 28).

B. Wetlands of Dane County, Wisconsin (1974)

The Wetlands of Dane County, Wisconsin (Dane County Regional Planning Commission, 1974) contains management recommendations which emphasize the limited capacity of the marsh to maintain sustained quality under conditions of excessive sedimentation. The study recommends that the marsh should be viewed as an indicator of land use problems, just as canaries are used to detect gas problems in mines. If the nutrient and silt load on marshes is too great, it is the land practices upstream which must be altered. We can use a marsh, such as Pheasant Branch, as a warning system to let us know when to improve land practices.

The specific management recommendations of the Wetlands of Dane County, Wisconsin call for a heavy emphasis on wildlife habitat maintenance, educational functions of the marsh as an "outdoors laboratory," and as a supplemental water quality protection to be combined with upstream management. These management recommendations are generally consistent with current management objectives.

C. Pheasant Branch Stormwater Management Study (1978)

The Pheasant Branch Stormwater Management Study (Spooner Engineering-North, March 1978) tested the Soil Conservation Service computer program TR-20 to reproduce historically measured storm runoff events in the Pheasant Branch watershed. Based on the use of the computer programs, peak discharge rates were determined for two future growth conditions. The general finding was that peak discharge will increase significantly with further development within the watershed.

The study recommends on-site stormwater management as the most effective means to control damage from peak rate runoff. The study suggests that large detention basins which would control peak flows for extensive upstream areas are not economically feasible.

D. Sediment and Erosion Control Investigation (1980)

A subsequent Spooner Engineering-North study Sediment and Erosion Control Investigation (February, 1980) looked specifically at erosion and sediment control issues east of U.S. Highway 12. The study analyzed the effectiveness of measures taken to date and recommends future actions. The general findings are as follows:

- Streambank erosion control measures, primarily gabion structures and sheet piling have been effective in the reach between U.S. Highway 12 and Century Avenue;
- Measures dealing with stream bed degradation and deposition of materials within Lake Mendota have not been satisfactory;
- Most of the sediment deposited at the delta at the entrance to the marsh is sand from streambank and stream bed erosion in the lower reaches of the main stem.
- Finer silts and clays carried from upstream storm runoff tend to go through the marsh and enter Lake Mendota;
- More streambank stabilization measures similar to those already constructed will be necessary to protect existing structures and to retard undercutting of banks where development is threatened; however, to the maximum extent possible the creek should be allowed to establish natural meanders;
- Vegetation management on the steep sloped banks of the ravine may be effective in reducing erosion caused by over land runoff. Vegetation will not be effective in controlling erosion in areas subject to high stream velocities;
- Frequent tree and debris clearance within the creek may be the most cost-effective means to combat undercutting due to high water caused by stream obstructions;
- A major drop-structure is recommended at Century Avenue to control stream bed degradation and dissipate energy;

- A sediment basin is recommended for the creek at the entrance to the marsh. Such a basin would collect both scoured sediments (mostly sand) from the reach between U.S. Highway 12 and the marsh and some of the finer sediments from further upstream. The Spooner report maintains that such a sediment basin could improve the quality of the marsh and retard the formation of the delta at its entrance. The basin would require periodic dredging.

E. Sixmile - Pheasant Branch Creek Priority Watershed Plan (1981)

The Sixmile - Pheasant Branch Creek Priority Watershed Plan prepared by the Dane County Regional Planning Commission and Wisconsin DNR in July, 1981 is a more recent statement of funding priorities for watershed management and sediment and erosion control in Pheasant Branch Creek. The Priority Watershed Plan specifically recommends Wisconsin Fund matching funding for 2,360 feet of streambank improvement between Century Avenue and U.S. Highway 12 and 1,000 feet of streambank improvement between Century Avenue and the marsh. The plan does not recommend funding the proposed Century Avenue drop structure because of its estimated \$175,000 cost. The sediment basin at the entrance to the marsh recommended in the Spooner report (1980) is also not recommended for funding due to its limited capacity to trap dissolved nutrients.

It should be noted that the City of Middleton Public Works Department would like to reinstate funding of the drop structure at the Century Avenue bridge. It is felt that this would be the most effective means to reduce the velocity of the stream.

The Priority Watershed Plan recommends reconsidering the findings of the 1978 Spooner study which suggested the limited feasibility of upstream detention basins. The bulk of the Wisconsin Fund support in the watershed outside the Middleton city limits will be directed toward upstream detention basins.

F. Consensus of Multiple Studies

The net effect of these and other studies of the basin has been a policy of incremental or phased improvements with extensive periods of testing. No overall comprehensive policy of management has evolved to date.

There seems to be a general consensus among all of the studies that the ultimate solution to most of the nutrient loading, fine sediment transport, and erosion caused by peak flows is on-site upstream management. While upland management is commonly recognized as the most effective watershed management practice, there are not effective institutional mechanisms for enforcing on-site watershed management outside of the City. Neither Dane County nor the City of Madison currently have effective erosion and sediment control ordinances. Middleton has such an ordinance, but implementation and enforcement has in the past been uneven.

The other area of consensus is that further streambank erosion controls are required to protect existing structures and prevent loss of property value. There is some variance in the amount and type of streambank control recommended. The "non-structural" advocates appear to favor allowing the creek to meander as much as feasible since each additional structure seems to be merely a "band-aid" approach that has the effect of shifting the problem to another point further downstream. The other end of the spectrum would essentially channelizing and lining the entire creek between U.S. Highway 12 and the marsh.

In general, the Pheasant Branch Natural Preserve Master Plan is predicated on a minimal streambank erosion control program; opting to allow maximum feasible meandering. It is recognized that some continuing streambank erosion controls will be required in the reach between U.S. Highway 12 and Century Avenue to protect existing structures and development. Furthermore, the new trail bridge crossing recommended for the reach between Century Avenue and the marsh may require some future streambank stabilization. The bridge is designed with a 60 foot span to anticipate some channel movement within the span. The bridge is also located on a reach which to date has not experienced meandering tendencies. Other than these two areas it is recommended that as much meander as possible be permitted.

Although it appears that no across the channel drop structures will be constructed in the near future, it is recommended that if any such structures are built in the future, that recreational trail crossings be integrated into the design where feasible and/or necessary.

An additional area where there is an opportunity to integrate recreational planning with overall watershed management is the encouragement of using trails rather than random cross country short cuts in areas with steep erodible banks. Appropriate signage and good trail maintenance are the most effective ways to keep people on trails and prevent "short-cutting" which can start erosion patterns. The 1980 Spooner study in particular points to the need for preventing pedestrian and recreation-caused streambank erosion.

VI. NARRATIVE DESCRIPTION OF PHEASANT BRANCH NATURE PRESERVE MASTER PLAN

The Master Plan calls for continuing the policy of multiple-objective management of the Pheasant Branch basin. The area should be managed as a natural area subject to the changes and vicissitudes of nature. In some instances this may mean a reduction in short-term aesthetic and recreational amenities due to natural changes in the creek or restricted all-season access to some areas of the Nature Preserve.

The limited improvements planned for the Nature Preserve are designed to provide a passive recreational setting which emphasizes activities such as primitive hiking, cross country skiing and wildlife observation. There are no active recreation sites planned within the Nature Preserve. It should be noted that there are ample opportunities for active recreation, and active recreation expansion, at several parks and school grounds contiguous to the Nature Preserve for its entire length.

One of the primary values embraced by this Plan is the opportunity for the Nature Preserve to be an environmental laboratory for both organized groups, such as school classes and individuals. Because of the diversity of ecological communities there is an opportunity to experience a wide variety of environments ranging from highly disturbed development fringe environments to near pristine wetlands. The acquisition and development program is geared for the ultimate inclusion of native prairie, upland forest and additional wetlands within the Nature Preserve.

The only construction proposed for the Nature Preserve is associated with either providing access or minimal seating and observation spots for passive recreation. The two bridge crossings identified on the

plan map are necessary to provide all season access in a loop configuration. The bridges have been designed and placed so as to have minimal impact on the environment. The boardwalk leading from the east bridge to the upland forest will provide an access point into the actual wetland for nature study and observation. The boardwalk is designed to not create an impediment to the natural flow of water or to unnecessarily disturb wildlife habitats. The trail itself is anticipated to be unsurfaced except where it goes up steep slopes and may require graveling and cross ditching to prevent erosion. It would be feasible at some point in the future to make the trail suitable for bicycle usage but such improvements are not anticipated in the near future.

The parking areas identified on the Master Plan are all located at the periphery of the Nature Preserve and are designed to accommodate visitors in as non-intrusive a manner as possible. The west parking area off of Pheasant Branch Road may include a picnic area with tables. This site provides an outstanding overview of the marsh and is envisioned as a popular access point for persons driving to the Nature Preserve. Six other parking areas of various sizes are indicated on the Plan.

In addition to vehicular access, the Plan establishes pedestrian and bicycle linkages to other parts of the City. These are viewed as extremely important connectors in the City's overall pedestrian and bike trail system. Most of the connectors will require implementation of the pedestrian access provisions of the City's Zoning and Subdivision Ordinances. The four key linkages are the pedestrian easements to Orchid Heights Park, to Greater Highlands, to Northside Elementary School and Graber's Pond, and to the industrial land west of U.S.

Highway 12. These linkages should be considered as important as any other improvements noted on the Plan.

The Nature Preserve land acquisition remained essentially unchanged from the earlier D'Onofrio study proposals have (1973) except for the scheduling and some minor boundary adjustments. The implementation of the acquisition program has received a major setback due to the elimination of the LAWCON and ORAP funding programs for local parks. Nearly all of the marsh area was acquired through these programs in the 1970's. Hopefully, in the future these programs, or similar programs, will be reactivated permitting completion of the acquisition program. In the meantime, the City should be prepared to expend its own resources for some of the key parcels and/or easements providing key linkages.

In terms of small and more affordable acquisitions, the key parcels are the pedestrian easement linkage to Orchid Heights Park, the conservancy portion of the proposed public works garage site west of U.S. Highway 12 (negotiations underway) and the vista point west of Pheasant Branch Road on the Marshall Erdman property (to be acquired by dedication at the time of development).

A potentially key acquisition is the frontage on Century Avenue which is part of the Sieger property. The land is the largest parcel of undeveloped woodland in the City. The site is zoned and platted for single family development but is generally unsuited for such development because of low conditions and poor soils. The land would be extremely important frontage for the Nature Preserve and would enable the protection of the forest stand as a buffer area for the marsh. Due to

the high land values involved it is recommended that the City consider a "land exchange" with the property owner whereby the City could trade publically owned upland elsewhere in the City for this valuable woodland and Century Avenue frontage.

The City should also acquire the Sauk property located east of the Sieger property. This land is also low woodland unsuitable for development. Because development is not proposed for this site, acquisition of this parcel is not as high a priority as acquisition of the Sieger property. The three older residences fronting on Century Avenue should also be ultimately acquired by the City, but such acquisitions are not necessary in the near future.



Typical Trail Section in Ravine



Pheasant Branch Creek Near Marsh

VII. RECOMMENDED MAJOR LAND ACQUISITIONS

<u>Acquisition</u>	<u>Priority Ranking</u>	<u>Comments</u>
1) Ziegler Property/Public Works Garage Site (3 acres)	I	Negotiations Underway
2) Marshall Erdman Property Vista Point (0.5 acres)	I	To be acquired through land dedication at the time of development
3) Pedestrian Easement Across H. Acker Property to Orchid Heights Park	I	The easement should follow the east property line of the H. Acker parcel between Outlot 2, Greater Highlands and Orchid Heights Park.
4) Interim Lease for Parking at the Southwest Quadrant of the Branch Street Century Avenue Intersection	I	Lease to be abandoned at the time of Sieger parcel acquisition.
5) Sieger Property (Lots 2 through 7, Block 3, Pheasant Branch plus Frontage on Century Avenue) (7 acres)	I	
6) Sauk Property (7 acres)	I	
7) Henry Ackers Property (NW $\frac{1}{2}$ NW $\frac{1}{2}$ Sec. 6 Town of Westport)	I	The Eastern Half to be used for Expanding Orchid Heights Park.
8) Frederick Property (SE $\frac{1}{4}$ SE $\frac{1}{4}$ and NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 36, Town of Springfield and portions of NW $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 36, Town of Springfield)	I	See Plan Map for exact acquisition recommendations.
9) Walsh & Pfister Property (10 acres)	I & II	This land is a narrow strip south of the Frederick Property.
10) Magna Builders, Inc. Property (portion of NW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 1, Town of Middleton) (35 acres)	II	
11) Frederick Property (SW $\frac{1}{4}$ SE $\frac{1}{4}$, Section 36, Town of Springfield) (50 acres)	II	

VIII. RECOMMENDED TEN YEAR CAPITAL IMPROVEMENT PROGRAM (Excluding Acquisitions)

	Project	Estimated Cost	Target Date
1)	Construct Southern Loop Trail System*	\$65,000	1983-1984
2)	Construct 12 Space parking area on Pheasant Branch Road (gravel surface)	5,000	1983-1984
3)	Construct 20 Space parking area near Century Avenue bridge crossing (paved surface)	20,000	1985
4)	Construct 8 Space parking area at the north end of Greater Highlands associated with the proposed elevated water storage tank.	5,000	At the time the water facility is constructed.
5)	Construct 8 Space parking area on Outlot 2 Pocus Marina Terrace (paved surface)	10,000	At the time Marina Drive is completed.
6)	Construct an under the street trail crossing beneath the Century Avenue bridge	Dane County Highway Dept. Cost	At the time the Century Avenue bridge is rebuilt or improved
7)	Construct the Northern Loop Trail System (no bridges or boardwalks required)	5,000	At the time Priority 1 and 2 acquisitions are complete
8)	Construct a 20 Space parking area near the Frederick's farm buildings (gravel surface)	7,000	At the time Priority 1 and 2 acquisitions are complete
9)	Construct a culvert pipe beneath the street trail crossing at U.S. Highway 12	Wisconsin DOT cost	At the time U.S. Highway 12 is rebuilt or improved

*Note: See Appendix A for more detailed design and cost estimates.

IX. MANAGEMENT RECOMMENDATION

1. As financial resources become available, the City should hire a full-time Parks Director to oversee the physical development of the park and open space system. Such personnel should have specific training in parks management and should be knowledgeable in the areas of nature education and environmental management.
2. Until a Parks Director is hired, the Director of Public Works should be charged with day-to-day management of the conservancy area. He should report annually (or more frequently, if requested) to the Park, Recreation and Forestry Commission on the status of the area.
3. There should be a continuing overlap of membership between the PR&F Commission and the Water Resources Committee to coordinate the interface between water resource management and recreation management for the conservancy area.
4. The PR&F Commission should include a member representing either a school or other organization which would potentially use the Pheasant Branch Nature Preserve for educational purposes.
5. The PR&F Commission should tour the entire Pheasant Branch Nature Preserve annually for the purpose of evaluating ongoing operations and refining acquisition and development plans.
6. The PR&F Commission should request the Planning Commission to establish a 100' building setback requirements along Pheasant Branch Creek from U.S. Highway 12 to the east crossing at Century Avenue. Such setback requirements should become part of the City of Middleton Zoning Ordinance.
7. The PR&F Commission should review all development proposals for land adjacent to the Pheasant Branch Nature Preserve.
8. The PR&F should annually review rules and regulations for use of the Nature Preserve.



Consulting Engineers • Civil • Structural • Geotechnical • Materials Testing • Soil Borings • Surveying

1409 EMIL STREET, P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848

March 1, 1982
C 10153

Stockham and Vandewalle
402 W. Lakeside
Madison, WI 53715

Attention: Mr. John Stockham

Re: City of Middleton
Park and Open Space Plan
Bridges and Boardwalk at Pheasant
Branch Nature Preserve

Gentlemen:

As requested, we have prepared schematic drawings and cost estimates for two bridges and a boardwalk to be considered for the Pheasant Branch Nature Preserve. The drawings depict structures which we believe to be appropriate for preliminary consideration. However, these plans are schematic only and could be subject to revision in final design, since no foundation or structural calculations were performed.

The locations of the proposed structures were determined by Stockham and Vandewalle in consultation with the City of Middleton. Site information was gathered in two visits by personnel from Stockham and Vandewalle and Warzyn Engineering. Topographic information was obtained from the City of Middleton, and consisted of 1" = 100' scale photogrammetric mapping performed by Owen Ayres and Associates, revised April 16, 1980. Water surface elevations of the 100-year and 10-year flood were obtained from the Flood Insurance Study produced in November, 1979, by the USGS, Madison Office. Information on channel erosion in Pheasant Branch Creek was obtained from a report prepared for the City of Middleton by Spooner Engineering-North in February, 1980. No soil boring information was available for the proposed sites.

Procedures and assumptions used in developing the proposed structures are described below:

Pheasant Branch Creek - West Crossing (Drawing C 10153-A1)

The proposed west crossing of Pheasant Branch Creek is at a location where the stream is contained in a fairly steep-sided, straight channel. The banks and bottom are composed of sand with occasional organic clay lenses. The presence or absence of peat at depth was not determined as part of this project. Considerable caving of banks has occurred shortly upstream of the proposed site, and the channel has scoured approximately 3 feet lower in the period 1971-1979. The 10-year flood is approximately bank-full, and the 100-year floodway spreads out over a considerable area to the west of the main channel.

The most economical bridge structure would be a prefabricated bridge section, of which there are many manufacturers. Preliminary contacts with manufacturer's representatives indicate that the costs of steel and timber prefabricated bridge structures is similar. A steel structure has the advantages of ease of installation, low maintenance, and resistance to vandalism. A wood structure may be more aesthetically pleasing, however. A prefabricated steel bridge structure with a wood deck, 6 feet wide, 65 footspan, was used in developing the cost estimate for the west crossing.

Considering the length of span required, and the resulting costs, a prudent design would place the bridge above the regional (100-year) flood elevation. The bridge depicted in Drawing C 10153-A1 has a span of 65 feet. A shorter span could be possible, but would require considerable riprap or gabion protection of the sand banks, which would detract from the aesthetics of the bridge crossing, and may also present a constriction to flood flow in the channel. Therefore, a longer span with no extensive bank preparation was evaluated for this preliminary layout. A drilled pier foundation was assumed in developing the construction cost estimates. Final design investigations may show that a driven pile foundation may be required. A driven pile foundation would be much more expensive than the drilled pier foundation.

Pheasant Branch Creek - East Crossing (Drawing C 10153-A2)

The proposed east crossing of Pheasant Branch Creek is in an area of low banks, with a wet bottom land forest to the west, and marshland to the east. The banks are composed of muck, with conditions at depth unknown. The banks are flooded extensively by both the 10-year and 100-year flood events.

A low, wooden, site-constructed bridge with a span of 35 feet, 6 feet wide, is considered most appropriate for this site. The structure would be inundated by the 10-year flood, but has sufficient strength so that it will probably suffer no damage from occasional flooding. The proposed structure, composed of treated poles and rough-sawn lumber, would have a rustic appearance.

Mr. John Stockham
Madison, Wisconsin

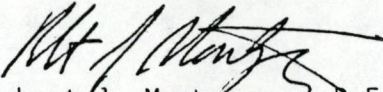
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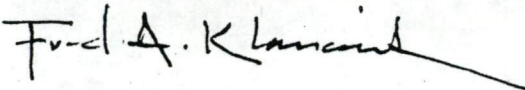
March 1, 1982
C 10153

Should you have any questions on the above, do not hesitate to contact us. It has been a pleasure working with you on this project.

Respectfully submitted,

WARZYN ENGINEERING INC.

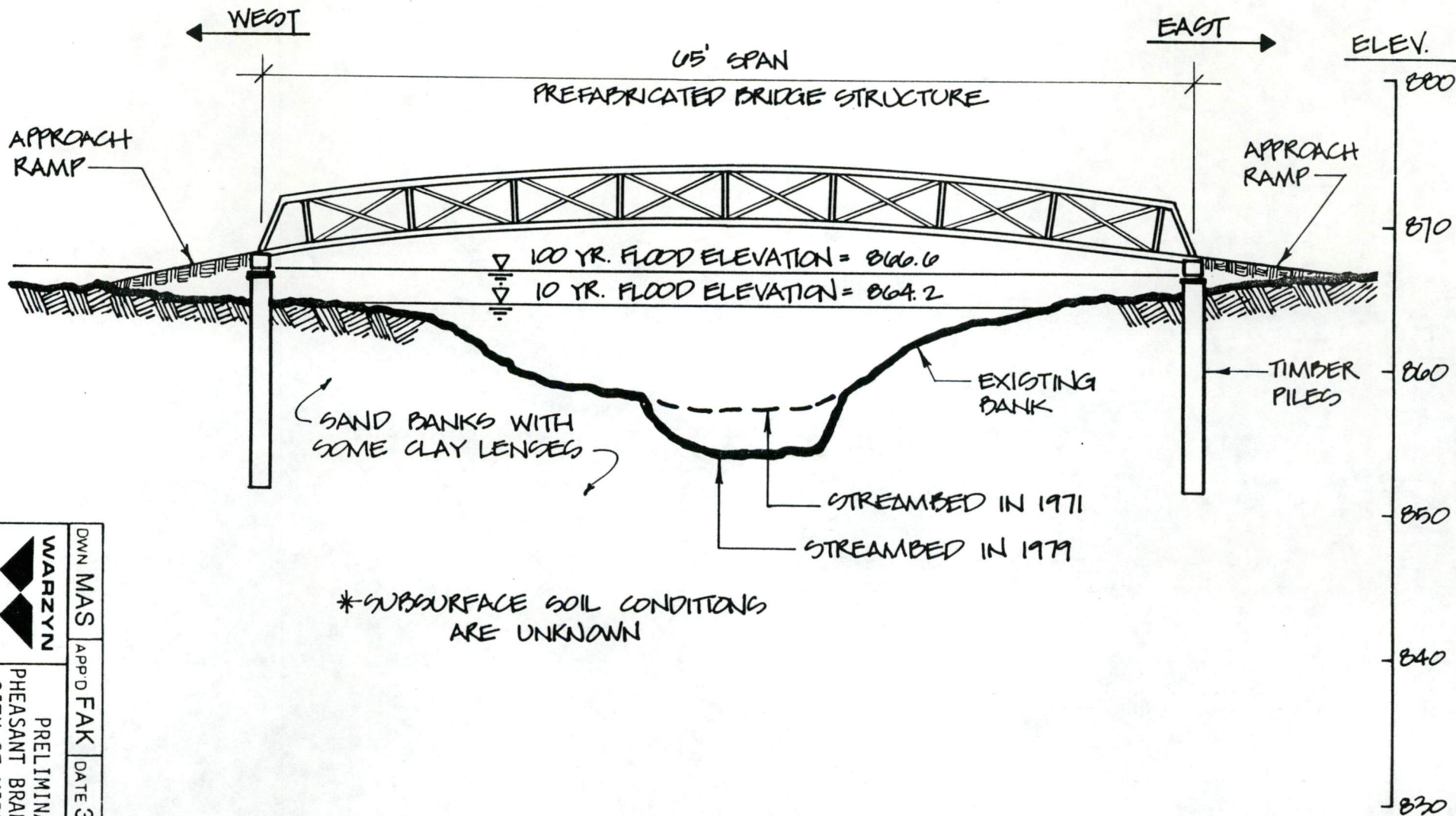

Robert J. Montgomery, P.E.
Hydraulic Engineer


Fred A. Klancnik, P.E.
Director of Site Development

RJM/FAK/dkp
[WEI-77-38]

Encl: Drawings C 10153-A1, -A2, -A3





PRELIMINARY LAYOUT OF
WEST BRIDGE OVER PHEASANT BRANCH CREEK

SCALE: 1" = 10'

* LOCATED APPROXIMATELY 1700 FT. NORTH OF CENTURY AVE.



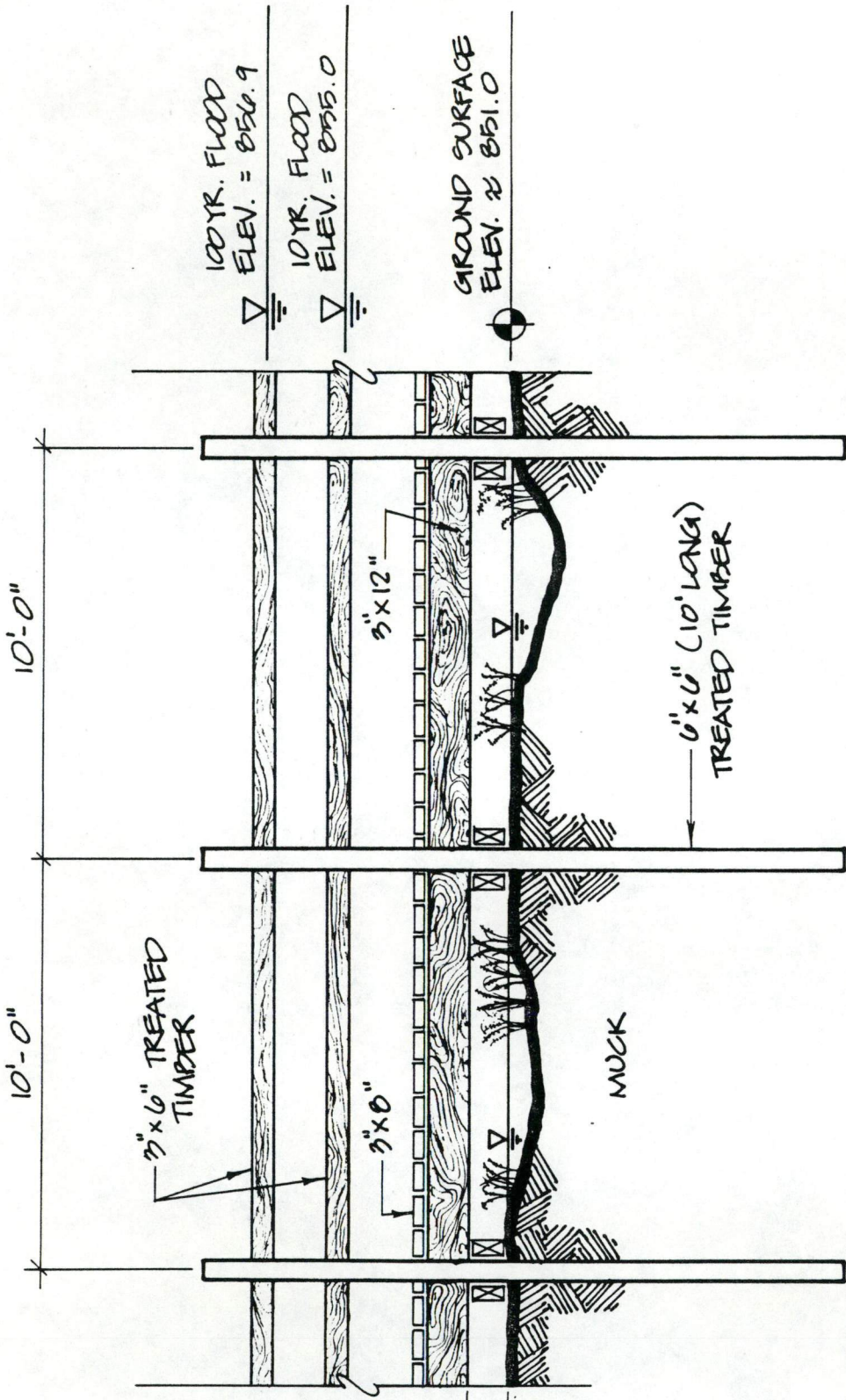
OWN MAS

APP'D FAK

DATE 3/1/82

C10153-A1

PRELIMINARY ENGINEERING
PHEASANT BRANCH NATURE PRESERVE
CITY OF MIDDLETON, WISCONSIN



10'-0"

10'-0"

3"x6" TREATED
TIMBER

3"x6"

3"x12"

6"x6" (10' LONG)
TREATED TIMBER

MUCK

100 YR. FLOOD
ELEV. = 856.9

10 YR. FLOOD
ELEV. = 855.0

GROUND SURFACE
ELEV. ≈ 851.0

12" MIN. CLEARANCE

ELEV.
860
855
850

**PROPOSED BOARDWALK OVER
A PORTION OF PHEASANT BRANCH MARSH**
SCALE: 1/4" = 1'-0"

OWN MAS APP'D FAK DATE 3/1/82 C10153-A3



PRELIMINARY ENGINEERING
PHEASANT BRANCH NATURE PRESERVE
CITY OF MIDDLETON, WISCONSIN