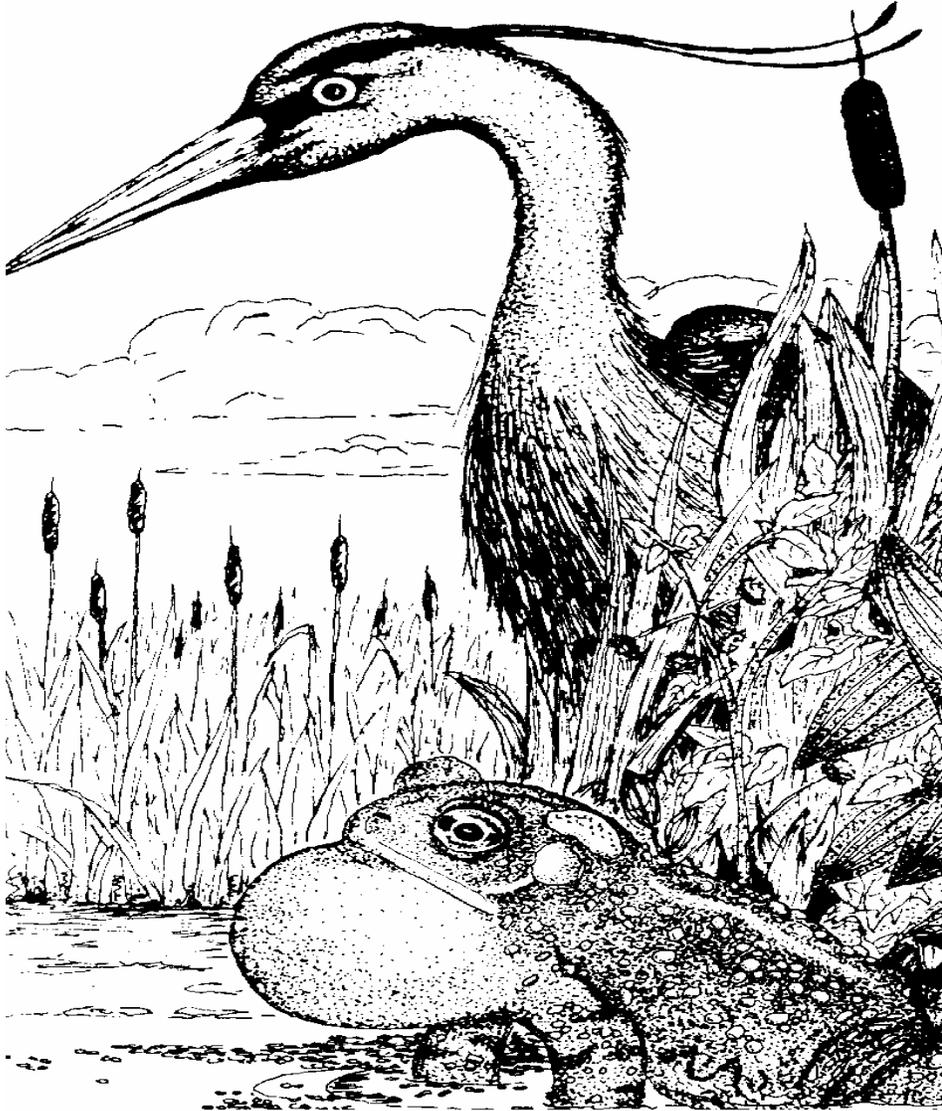


Wetland Protection and Management Plan



**City of Bloomington, Minnesota
June, 1997**

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Other Material Incorporated by Reference

- City Construction Project As-built Drawings
- Historical Aerial Photos of City
- City Storm Sewer Half Section Location Maps
- Topographic Maps of City
- Infra Red Aerial Photos of City, 1994
- Metropolitan Mosquito Control District Maps of City, 1995
- National Wetland Inventory Map, 1979



Acknowledgments

This plan was prepared by City staff with guidance from the ad hoc Wetland Advisory Committee. The City wishes to thank the members of the Committee for their many hours of involvement in the planning process.

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Judie Miller - Vicechairperson
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The City also thanks the representatives from the Board of Water and Soil Resources (BWSR), the Minnesota Department of Natural Resources (MDNR), and the Minnesota Pollution Control Agency (MPCA) who were involved in the process. Their input, especially that of David Johnson of the BWSR, allowed for an expeditious review and approval of the plan.

A special thanks is given to Audrey Nielsen, Constance Ricci and Jill Weinand for their efforts in word processing, desktop publishing, reproduction and assembly of the plan.

Artwork by: Jim Kostohrys



Executive Summary

The overall goal of this Wetland Protection and Management Plan is to provide guidance for future management decisions concerning wetlands that will result in the preservation of the wetlands and their functions and values. The goal will be met through the implementation of the recommendations presented in this plan.

This Wetland Protection and Management Plan meets the requirements of Minnesota Rules, Chapter 8420, part 8420.0650. The plan is consistent with the pertinent goals and policies of the watershed districts and the watershed management organization that have jurisdiction in portions of the City. It also addresses the requirements of Hennepin County and the Metropolitan Council.

The plan addresses the management of those wetlands in the City located above the Minnesota River Valley. It inventories and classifies approximately 300 wetlands. The wetlands are ranked based on their functions and values, how they are managed, and their susceptibility to storm water and snow melt runoff. The plan recommends specific actions to be taken to provide for appropriate management of the wetlands in the future.

The introduction to the plan, Section 1.00, provides a brief history of wetlands in Bloomington. The specific legislative and regulatory requirements of the plan are summarized; as are the steps in the process that was used to develop the plan. The introduction also includes information concerning the make-up and the duties of the ad hoc Wetland Advisory Committee.

Section 2.00 of the plan describes the process used to conduct the field inventory of the wetlands. It also explains each of the components of the City's wetland classification system. The individual wetland inventory data summary sheets from the inventory are presented in Appendix A.

The assessment of needs for each of the wetlands is presented in Section 3.00. This is done on a sub-watershed, or drainage area, basis. A general description of each of the 20 sub-watersheds that have wetlands is provided, along with an overview of wetland quality and a summary of recommendations. Specific recommendations for each wetland in a sub-watershed are presented in a tabular format.

Section 4.00 presents the existing City policies, ordinances and programs that address wetland issues. It also discusses the recommendations for changes to, or the addition of new, policies, ordinances and programs to facilitate implementation of the plan, (i.e., address the needs of the wetlands).

Recommendations for capital improvements and the reasons for them are included in Section 5.00. This section also discusses the need for operation and maintenance of infrastructure facilities.

The implementation program and prioritization of recommendations are discussed in Section 6.00. This section explains the prioritization process, presents the recommended implementation schedule, the estimated cost of each project or program, lists the divisions within the City that would be responsible for implementation of various portions of the plan and provides a list of possible funding sources for various plan components.

Section 7.00 discusses special considerations including how the wetlands located in the Minnesota River valley will be addressed, how regional water quality issues might affect wetlands and the relationship between the wetland management plan and the comprehensive surface water management plan.

The requirements for amending the plan are presented in Section 8.00. This section is followed by the appendices; the glossary of terms and abbreviations; and the index.



How to Use This Document

City Staff

The primary audience for this document will be those individuals or City staff who are involved with activities that affect wetlands. Sections 4.00, 5.00 and 6.00 will be used most frequently because they address all of the recommended action steps in the plan.

Section 4.00 presents summaries of the discussion and recommendations for changes to, or the development of new, City policies, ordinances and programs affecting wetlands. Each of the sub-sections deals with a different policy, ordinance or program. The sub-sections provide, at a minimum, the recommendations for change or addition that City staff will use as the basis for a detailed review. In some cases, suggested text revisions are also provided.

Section 5.00 addresses the recommendations for physical improvements to the storm water management system, its operation and maintenance. The proposed schedule for completing the tasks in Section 4.00 and 5.00 is presented in Section 6.00. This schedule will be considered when preparing budget requests and developing work assignments.

General Public

This document contains information on every wetland waterbody in the City that is not located in the Minnesota River valley. Specific topics can be found using the table of contents and the index. Information on a specific wetland can be found in Section 3.00 and in Appendix A.

To find information about a wetland, one starts by finding the drainage area that the wetland is located in on the Water Body/Drainage Area Map (Figure 1). This map shows the street system, the drainage area boundaries, the wetland locations, the unique identification number assigned to each wetland, its common name, and the MDNR protected waters inventory number for the wetland. Next, the drainage area name is located in either the table of contents or the index. Information on a specific wetland is found in the appropriate drainage area sub-section by looking for the wetland's identification number or its common name.

The City also has a water body data base that contains additional information. Questions about the use of this document, how to view materials included by reference or about a specific wetland can be directed to the Engineering Division of the Public Works Department.



1.00 INTRODUCTION

Wetlands were a part of the landscape in Bloomington long before the first human being arrived in the area. They are part of a dynamic natural system that changes constantly. This system has changed much more rapidly due to human influences. Society has been slow to recognize the benefits that wetlands offer and the impact that centuries of human disturbance have had on wetlands and the larger ecosystem. This plan has been prepared as a means of slowing or halting the wetland disturbances caused by human activity.

One must understand why it is important to preserve wetlands before one can see the need for the recommendations presented in this plan. A healthy wetland can perform many beneficial functions. It can serve as a filter to absorb polluted surface water runoff before it enters lakes or creeks. A wetland can store water; thus providing flood protection in times of heavy rainfall and a source of groundwater recharge. It provides a home and a source of food for many types of native and migratory birds and wildlife. Numerous recreational and educational opportunities are provided. In some cases, commercial benefits, such as wild rice production, can be recognized. The ability of a wetland to perform particular functions is often directly related to the degree of human influence on the tributary drainage area of a wetland.

This wetland protection and management plan acknowledges that human influence. The plan recommends realistic changes that can be made to address wetland management. The plan looks at each wetland as an individual physical feature and as a component of the larger landscape. The plan has been developed with the goal of providing clear guidance for future decisions concerning wetlands in the City of Bloomington.

In preparing this plan, City staff and the Wetland Advisory Committee members considered the historical uses of wetlands and how perceptions of the value of a wetland have changed through time. Initially, open water wetlands were used as a source of water for livestock. As agriculture, and later, urbanization grew, wetlands were often viewed as useless land unless they could be drained or filled to convert them to farm land or developable land. Those wetlands that remained were typically wetlands with some open water areas. These were perceived as desirable for their aesthetic value and were often encircled by residential development. The value that people place on open water wetlands can be seen in the fact that homes built on wetlands typically sell for five to ten percent more than identical homes located across the street.

The group weighed the numerous, sometimes conflicting, desires for how the City's wetlands should be managed. An example of this is the issue of managing a wetland to provide habitat for fish and wildlife. A portion of the general public recognizes the value of providing a natural vegetative buffer around a wetland and allowing emergent vegetation to flourish in the shallow water areas closer to shore. Others see a wetland as a smaller version of a lake and place value on being able to maintain a lawn to the shoreline and as much open water area as possible.

The plan meets the statutory and regulatory requirements for the use of wetlands while balancing the demands and desires of various constituencies -- property owners who live, or operate businesses, adjacent to the wetlands; residents who use the public parks; any property owners who have land that generates storm water runoff that eventually reaches a wetland; City maintenance personnel and City policy makers.

The plan presents recommendations for changes to, or additions of, City policies, ordinances and programs that will be used as management tools to insure that the desired protection outcomes are



achieved. It also provides recommendations for capital improvements to the existing storm sewer system that will improve the quality of water discharged to wetlands. The plan includes an implementation schedule, lists the department that is best equipped to lead the implementation of each of the plan components and offers a list of possible funding sources.

1.10 History of Bloomington Wetlands

Prior to the arrival of Native Americans and European settlers, climatic changes were the driving force behind the evolution of the landscape in the area that would eventually become Bloomington. Changes in flora and fauna occurred either slowly, through the process of succession, or very quickly, due to fires, floods, windstorms or disease. The influx of European settlers began in the mid-1800's. This began a period of dramatic changes in the landscape as a result of human activities.

The Comprehensive Plan for the City of Bloomington includes a map of presettlement vegetation that was developed from the original government survey records for the territory. The Presettlement Vegetation Map (Figure 2) shows that the land located east of what is now Lyndale Avenue South was primarily prairie, with a few depressional wetlands. Much of the rest of Bloomington was vegetated with oak openings and barrens. Exceptions to this pattern were found in the upper portion of the Nine Mile Creek corridor, which was a combination of wet prairie and Big Woods association; two outcroppings of prairie in the southwestern part of Bloomington; and an area of wet prairie located in the west central portion of the City.

Another source of historic data is the 1901 USGS Minneapolis 15 minute quadrangle map, (Figure 3). This map provides greater detail, showing the ground contours and better definition of wetland, or marsh, areas. The map shows few wetlands in the area that was originally vegetated with prairie. Information is not available to allow one to discern the types of wetlands that were in existence during that time period. It is likely that seasonally flooded basins or meadows (type 1 and 2 wetlands, respectively) that existed were not considered to be marsh and would not have been mapped.

The conversion of land from its native vegetative cover to agricultural use began as soon as the area was opened to settlement. The eastern portion of the City was converted first because of the relative ease of clearing the prairie area and because of the relatively flat topography. As more settlers arrived, the clearing extended west through those areas covered with forest and having greater topographic relief. The impacts of the conversion process on the wetlands were twofold. The type 1 and 2 wetlands were put into agricultural production with minimal effort. Those wetlands that were not converted had their tributary drainage areas stripped of vegetation; increasing the amount of soil erosion and slowly filling the receiving wetlands. As farming practices changed, and chemical fertilizers and pesticides were used, the wetlands were degraded further as these chemicals were carried to them via storm water runoff.

The primary land use from the 1850's to the 1940's was agriculture. The development of the township and county road system, and private driveways to farmsteads, would add some additional wetland impact by changing drainage patterns within the watershed of a wetland.

Another dramatic change in land use occurred after World War II. Rapid urbanization brought conversion of agricultural land to more intense uses. Land that was not suitable for farming due to its relief was, in many cases, developable. Large areas of native forest were once again lost. Wetlands were filled and the amount of impervious surface increased substantially with the construction of homes, businesses, schools, churches and paved streets and sidewalks.

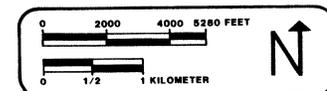


FIGURE 2 Presettlement Vegetation Map



**FIGURE B1.1
VEGETATION CIRCA 1850**

SOURCE: U.S. DEPARTMENT OF THE INTERIOR, FOREST SERVICE, 1929



**City of Bloomington, Minnesota
Department of Community Development
October 1982**

FIGURE 3
USGS Minneapolis 15 Minute Quadrangle Map (Circa 1901)



Department of the Interior
U.S. Geological Survey
Edition of October 1901, reprinted 1928

Development of the City modified the drainage patterns in the watersheds which, in turn, changed the wetlands. There was less land area with vegetative cover to permit storm water infiltration into the soil. Instead, storm water was conveyed overland, or via storm sewer, to wetlands. The loss of infiltration ability resulted in a reduction in the water table. The increased runoff to the remaining wetlands brought greater levels and, in some cases, duration of inundation and increased frequency of flooding. In many instances this was done by design to provide flood protection and to allow the storm sewer system to be constructed more economically. Storm water runoff from disturbed construction sites carried sediment to the wetlands. The storm water runoff also carried debris and pollutants from lawns, streets surfaces, parking lots and roofs. If a wetland's tributary drainage area was disturbed by either agriculture or urbanization, it can be assumed that the wetland experienced some degradation.

1.20 Legal and Regulatory Framework for Plan

This wetland management plan was prepared to meet the requirements of Minnesota Rules, Chapter 8410, part 8410.0170, subpart 4., which stipulates that the content of the local (i.e., city) comprehensive surface water management plan must contain a water resource inventory similar to that required of watershed management organizations under part 8410.0060. Subpart 4.C. of part 8410.0060 states that a city must provide, "either an inventory of the functional values of the wetlands present, a provision for a phased project to create the inventory within a given time frame, or the adoption of a specific process to identify the functional values on a case-by-case basis for the review of individual project proposals, all of which must be consistent with Minnesota Statutes, section 103B.3355."

Subparts 5 through 10 of part 8410.0170 require that a city's comprehensive surface water management plan establish policies and goals concerning water resources, assess existing or potential problems, provide solutions to those problems, prioritize the implementation of the solutions, and provide an implementation program for the overall plan. The plan must be consistent with the organization plans (county, watershed districts, and watershed management organizations) having jurisdiction in the city.

The primary requirements to be met for the watershed districts having approved water management plans are found in Section 2.4 of the Nine Mile Creek Watershed District's plan, in Section 5.2 of the Riley-Purgatory-Bluff Creek Watershed District's plan, and in Section 4.60 of the Lower Minnesota River Watershed District's plan (see Figure 4 for the watershed boundaries). The first generation plan for the Richfield-Bloomington Watershed Management Organization does not present specific management requirements for wetlands. The second generation plan will utilize the recommendations from this document and the City of Richfield's Comprehensive Surface Water Management Plan.

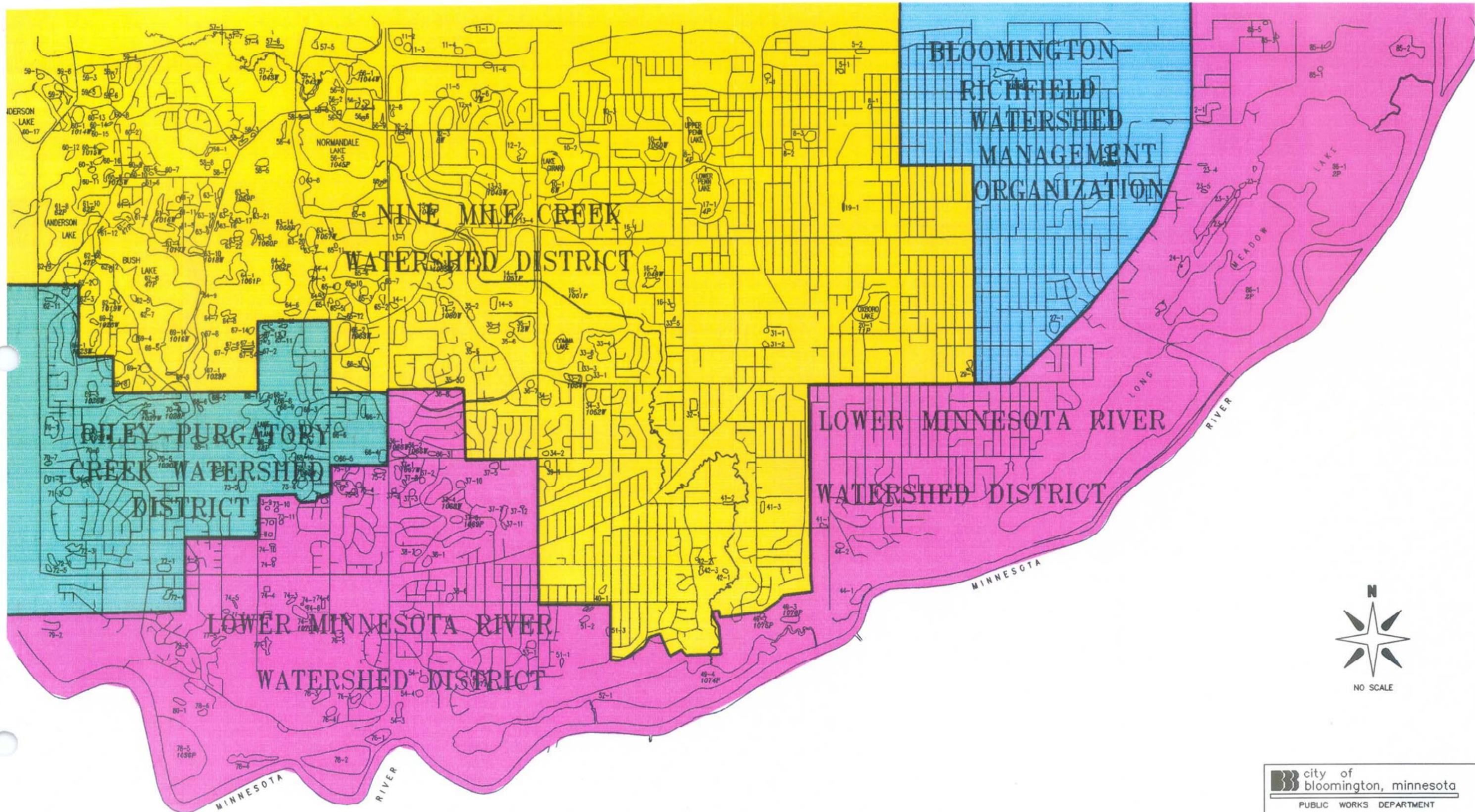
The City's intent at the beginning of its wetland planning process, in 1995, was to conduct a field inventory of those wetlands located above the Minnesota River valley to determine the functions and values of each wetland. The wetlands would be classified based on their current functions and values, how they are currently managed and their susceptibility to storm water runoff impacts. Recommendations would be provided concerning future management strategies.

A number of changes were made to the Wetland Conservation Act during the 1996 legislative session. One of the changes gave local units of government the option to prepare a comprehensive wetland protection and management plan. The plan would be approved by the Board of Water and Soil Resources. Local units of government with approved plans could vary sequencing and replacement



FIGURE 4

WATERSHED DISTRICTS AND MANAGEMENT ORGANIZATIONS MAP



standards. The specific requirements are presented in Minnesota Rules, Chapter 8420, part 8420.0650. The City decided to take advantage of this opportunity and adjusted its planning process to meet the requirements of the Rules revisions.

The recommendations provided in this plan may require permits or review by various state (WCA exemptions or mitigation plans, MDNR Protected Waters permits) and federal agencies. The agency jurisdiction for water body wetlands and watercourse wetlands is shown in Figures 5 and 6 respectively.

1.30 Planning Process

The basic format used to prepare the plan was that required for comprehensive surface water management plans. The process involved:

- determining the condition of the existing wetland resources,
- reviewing how the wetlands are currently managed,
- establishing goals and policies for management of the wetlands,
- assessing existing or potential problems,
- providing solutions to those problems,
- prioritizing the implementation of those solutions,
- preparing an implementation program for the entire plan, and
- preparing a monitoring and evaluation program

In the summer of 1995, the City used specially-trained interns to conduct a field inventory of all of the wetlands in the City that were located outside of the Minnesota River valley. City staff then classified the wetlands based on their functions and values, how each was being managed, and its susceptibility to storm water runoff.

The City Council appointed seven citizens to serve on an ad hoc wetland advisory committee in December of 1995. City staff reviewed the results of the inventory and the classification procedure with the committee. The committee reviewed the work of the staff throughout the remainder of the process.

The City formally notified the Board of Water and Soil Resources, the Minnesota Department of Natural Resources and the Minnesota Pollution Control Agency, in August, 1996, of its intent to prepare a comprehensive wetland protection and management plan in accordance with the Chapter 8420 requirements. Numerous meetings were held with representatives of these agencies and they were invited to the committee meetings.

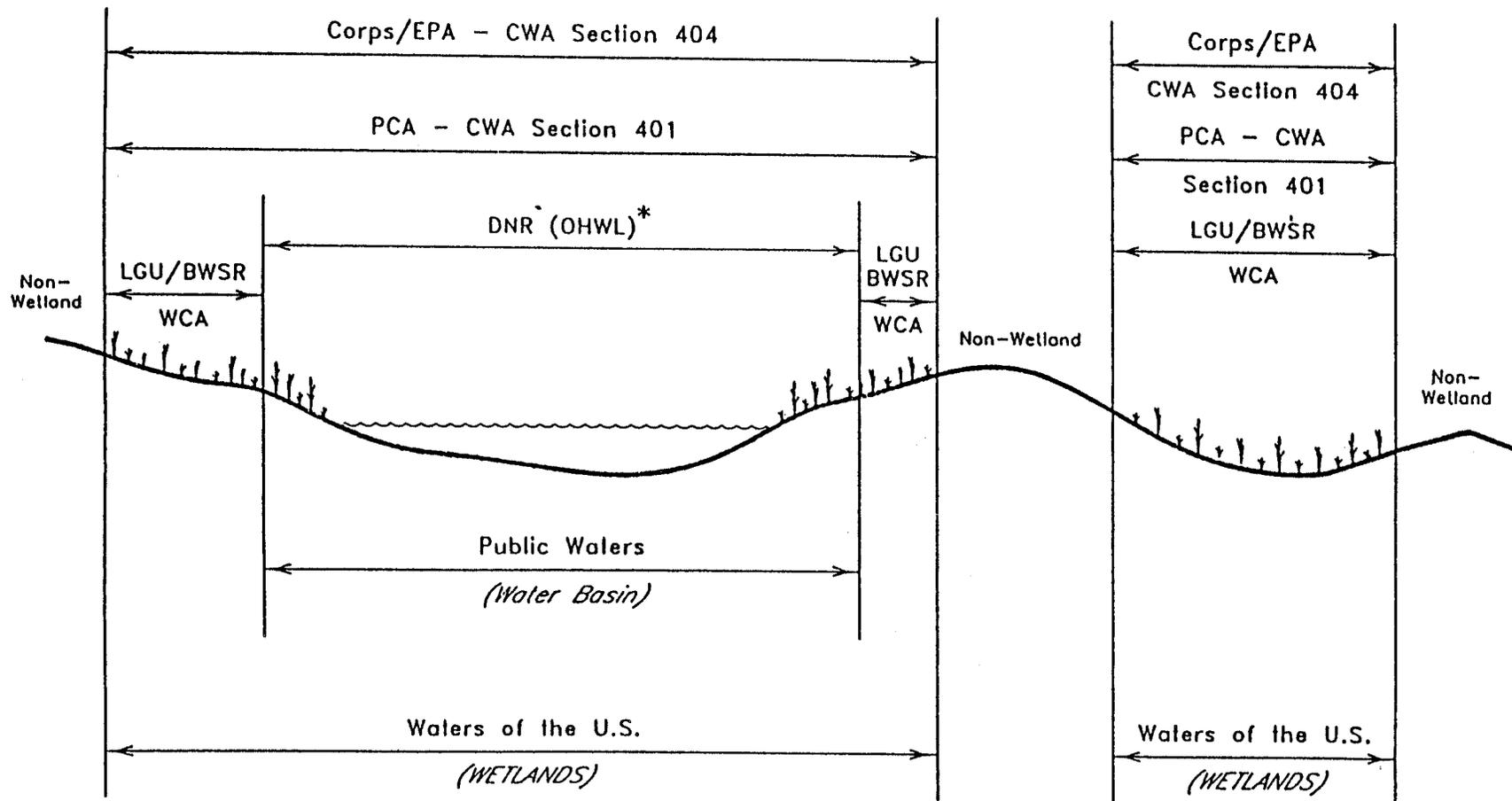
1.40 Wetland Advisory Committee

The City Council approved the establishment of an ad hoc wetland advisory committee in April, 1995; at the same time that it approved the preparation of the wetland inventory. The committee was charged with preparing a report for the City Council concerning a wetland management plan. The report was to include a wetland classification system and a prioritization of wetlands using that system. It was anticipated that the committee's report would also provide recommendations concerning other aspects of wetland management such as, storm water management, water quality



FIGURE 5

Agency Jurisdiction for Water Body Wetlands

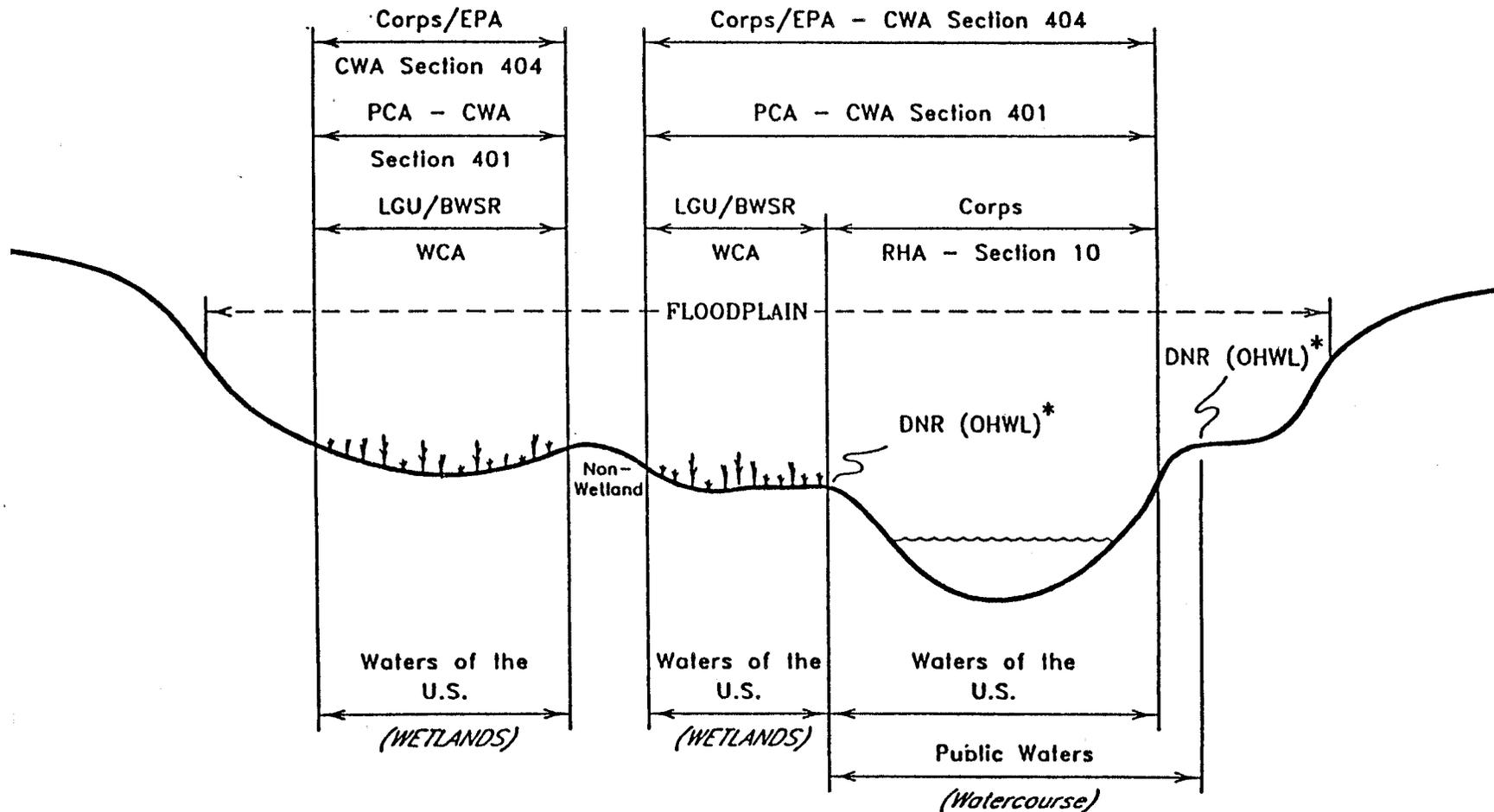


* Ordinary High Water Level
 The OHWL is an elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial.

Note:
 Most local government units (LGUS) have adopted state shoreland and floodplain zoning requirements into their zoning ordinances. Check with your local zoning office for requirements related to building sites, sewage treatment, grading and filling and vegetative removal.

FIGURE 6

Agency Jurisdiction for Watercourse Wetlands



* Ordinary High Water Level
 The OHWL (for water courses) is the elevation of the top of the bank of the channel.

Note:
 Most local government units (LGUS) have adopted state shoreland and floodplain zoning requirements into their zoning ordinances. Check with your local zoning office for requirements related to building sites, sewage treatment, grading and filling and lotline removal.

protection, enhancement of fish and wildlife habitat and recreational facilities, capital improvements and public education.

The City Council appointed seven citizens to the committee in December, 1995. The committee was made up of:

- a City Council member, who would serve as the chairperson,
- a Planning Commission member,
- a Parks and Recreation Commission member,
- a Natural and Historic Resources Commission member, and
- three citizens-at-large, one of whom would serve as the vice-chairperson.

The committee began meeting in January, 1996. The Wetland Advisory Committee Work Plan is included in Appendix B. The initial meetings were used to present educational information to the committee. The subsequent meetings included a field trip to look at the different wetland types and water quality treatment facilities, two input sessions for the general public, review of the results of the wetland inventory and classification, determination of existing and potential problems, review of existing and proposed policies, ordinances, and programs that would address the problems, review of possible capital improvements to address the problems, and review of an overall implementation plan.



2.0 Inventory and Classification of Wetlands

2.10 Wetland Inventory

The wetland inventory was completed using a slightly modified version of the Minnesota Routine Assessment Methodology for Evaluating Wetland Functions (MNRAM) as approved in the Wetland Conservation Act Rules, Chapter 8420. MNRAM was developed by the Minnesota Interagency Wetland Group comprised of BWSR, MDNR, Mn/DOT, MPCA, USCOE, USDA and USF&WS to be used as a field evaluation tool to assess wetland functions on a qualitative basis. MNRAM was being developed during the period of time that the inventory was being conducted. Bloomington was using an adaptation of the Wisconsin Rapid Assessment Method. Staff from Bloomington attended the interagency group meetings and adapted the Bloomington methodology to meet MNRAM requirements.

The functions for which values were assessed using MNRAM are listed in Table 2.10, found on the following page. The Groundwater Interaction and Commercial Uses functions were not evaluated during the 1995 wetland inventory. Groundwater Interaction was not evaluated due to the complexity and cost of such an undertaking. Commercial Uses were not evaluated because none of Bloomington's wetlands are currently being used for commercial purposes. Sample MNRAM inventory data forms and appendixes can be found in Appendix C.

Interns were used to conduct the field evaluations using MNRAM. Four interns, two graduates and two undergraduates, from the University of Minnesota's College of Natural Resources, were hired. Each intern had experience or course work in the areas of wetland soils, vegetation, and/or hydrology.

From June to September, 1995, interns completed field visits and assessment forms for approximately 300 wetlands located above the Minnesota River bluff line in Bloomington. Interns received MNRAM training from City staff with the assistance of MDNR representatives (listed below). The qualifications of the interns and the MNRAM training can be found in Appendix C.

The inventory information is compiled in a computer database. Individual wetland inventory data summary sheets can be found in Appendix A.

Representatives from the MDNR

<i>John Parker</i>	<i>Area Wildlife Manager</i>
<i>Joan Galli</i>	<i>Non-game Wildlife Specialist</i>
<i>Larry Westerburg</i>	<i>Forester</i>
<i>Molly Schodeen</i>	<i>Area Hydrologist</i>
<i>Ceil Strauss</i>	<i>Area Hydrologist</i>



Minnesota Routine Assessment Method Functions

Floral Diversity/ Integrity	Floral diversity/integrity is evaluated based on the number of plant communities and the variety of species within each community.
Wildlife Habitat	Wildlife habitat is evaluated based upon the quality of the habitat provided by a wetland related primarily to the level of disturbance or degradation compared to an undisturbed or least disturbed reference wetland of the same type
Fishery Habitat	Fishery habitat is evaluated based on the wetland's connection with deep water habitat.
Flood/Storm Water	Flood/storm water detention is evaluated based upon a wetland's ability to detain floodwater, the level of potential flood damage it prevents due to the attenuation of floodwater, the degree to which the wetland's tributary watershed is developed (i.e., the need for stormwater detention), and the infiltration characteristics of the soils in the tributary drainage area.
Water Quality Protection	Water quality protection is evaluated according to a wetland's ability to treat stormwater runoff. The value of this function increases with the importance of the downstream receiving water.
Shoreline Protection	Shoreline protection is evaluated based on the wetland's proximity to lakes, streams or open water basins and whether the wetland is positioned to absorb erosive forces (i.e. wave action, land uses, unstable soils).
Aesthetics/Recreation/ Education	Aesthetics, recreation, and education are evaluated based on the wetland's visibility, accessibility, evidence of recreational uses, evidence of human influences (e.g. noise and air pollution) and any known educational purposes.
Groundwater Interaction*	Groundwater interaction is evaluated based on the wetland's connection to ground water recharge and discharge and surface water flow-through.
Commercial Uses*	Commercial uses are evaluated based on the wetland's ability to provide a commercial product or agricultural commodity without hydrologic or vegetative modification.
*Functions not assessed in Bloomington wetland inventory.	



2.20 Classification System

City staff selected a water body/wetland classification system for Bloomington after reviewing the classification systems from four other cities, two watershed districts, and two watershed management organizations. Each wetland was classified using the five classification systems shown in the table below.

Table 2.20

Wetland Classification Table				
Minnesota 7050 Rule Classification	Bloomington Primary Use Classification	Sensitivity to Storm Water	Wetland Quality	Management Classification
Class 2B	Direct Contact	Highly Sensitive	Excellent	Preserve
Class 2C	Indirect Contact	Moderately Sensitive	Moderate	Apply Best Management Practices
Class 4B	Scenic Habitat	Slightly Sensitive	Highly Impacted	Utilize
Class 5	Detention	Least Sensitive		
Class 6	Nutrient/Sediment (Quality)			



2.21 Minnesota Rules - Chapter 7050 Water Quality Classifications

The Minnesota Rules, Chapter 7050, parts 7050.0130 through 7050.0220 apply to all waters of the state, both surface and underground. This portion of the Rules includes general provisions applicable to the maintenance of water quality and aquatic habitats; definitions of water use classes; standards for discharges of sewage, industrial, and other wastes; and standards of quality and purity for specific water use classes. The Rules also designate seven classes of Waters of the State.

The Nine Mile Creek and Riley-Purgurtory-Bluff Creek Watershed Districts have adopted, and will implement, the water quality standards of the Chapter 7050 Rules. These two watershed districts cover 55 percent of the City of Bloomington (see Figure 4).

Classes of the Waters of the State

- 1 Domestic consumption
- 2 Fisheries and recreation
- 3 Industrial consumption
- 4 Agriculture and wildlife
- 5 Aesthetic enjoyment and navigation
- 6 Other uses
- 7 Limited resource value waters

Refer to excerpts from the Minnesota Rules, Chapter 7050, located in Appendix D, for the full definition of the classifications that apply to the wetlands in this plan.



2.22 Bloomington Primary Use Classification

Each of the City's wetlands was reviewed to determine if one of its functions (as defined in MNRAM) had a much higher value than the others, or if one of its functions was more important than the others to the City because of the way the wetland was being managed. A classification scheme was developed based on the results of this review. This primary use classification system consists of two categories with multiple sub-categories and is presented below. It is intended to be used as a quick reference for individuals who are considering an activity that might affect a wetland.

Bloomington Primary Use Classifications	
Recreation	
	Direct contact (swimming)
	Indirect contact (boating, fishing)
	Scenic/habitat (education/interpretive study/preservation of wildlife)
Treatment	
	Detention (storm water storage)
	Nutrient/sediment (removal of nutrient/pollutant loading, sediment)

2.23 Wetland Sensitivity to Storm Water

The wetland sensitivity to storm water was evaluated using the Guidance for Evaluating Urban Storm Water and Snowmelt Runoff Impacts to Wetlands (May 1995 draft) by the State of Minnesota Storm Water Advisory Group. Sensitivity is discussed and evaluated in Section IV of that document: Wetland Susceptibility (see Appendix D).

Wetland type is determined by hydrology, vegetation and soils. Table 2.23, which follows this section, is a figure taken from the guidance document found in Appendix D. It lists wetland types according to their susceptibility to degradation by storm water input. It is important to note that there can be exceptions to the general categories listed. There is a broad range of tolerance among wetlands to urban storm water input.

As noted in the guidance document, "Diverse, sensitive native plant communities can be readily degraded by storm water impacts resulting in monotypes of sediment- and nutrient-tolerant species such as reed canary grass and/or cattails. Greater frequency and duration of inundation can destroy native plant communities as can depriving them of their water supply. Each wetland should be carefully evaluated to determine potential impacts from a proposed urban storm water project."

Wetland sensitivity is broken into 4 categories **highly, moderately, slightly** and **least sensitive/susceptible**. Wetlands were evaluated using the criteria in Table 2.23. For the expanded definitions of the 4 categories, see Appendix D.

It was necessary to estimate the amount of bounce and period of inundation occurring in each wetland for the rainfall events referenced in the guidance document. The flood level for a 1 percent chance rainfall of 24 hour duration has been computed for the majority of water bodies in Bloomington. This has not been done for more frequent rainfall events. The City is in the process of updating its storm water model. More frequent rainfalls will be considered in this round of modeling. If the results of the modeling show an impact to a wetland that affects its intended management function(s), City staff will determine what changes are needed to address the situation.



Table 2.23

SUSCEPTIBILITY (SENSITIVITY) OF WETLANDS TO DEGRADATION BY STORM WATER IMPACTS*

Highly Susceptible Wetland Types¹:	Moderately Susceptible Wetland Types²:	Slightly Susceptible Wetland Types³:	Least Susceptible Wetland Types⁴:
Sedge Meadows	Shrub-carrs ^a	Floodplain Forests ^a	- Gravel Pits
Open Bogs	Alder Thickets ^b	Fresh (Wet) Meadows ^b	- Cultivated Hydric Soils
Coniferous Bogs	Fresh (Wet) Meadows ^{c,e}	Shallow Marshes ^c	- Dredged Material/Fill Material Disposal Sites
Low Prairies	Deep Marshes ^{d,e}	Deep Marshes ^c	
Coniferous Swamps			
Lowland Hardwood Swamps			
Seasonally Flooded Basins			
<p>1. Special consideration must be given to avoid altering these wetland types, Inundation must be avoided. Water chemistry changes due to alteration by storm water impacts can also cause adverse impacts.</p>	<p>2. a,b,c) Can tolerate inundation from 6 inches to 12 inches for short periods of time. May be completely dry in drought or late summer conditions.</p> <p>d) Can tolerate +12" inundation, but adversely impacted by sediment and/or nutrient loading and prolonged high water levels</p> <p>e) Some exceptions</p>	<p>3. a) Can tolerate annual inundation of 1 to 6 feet or more, possibly more than once/year.</p> <p>b) Fresh meadows which are dominated by reed canary grass.</p> <p>c) Shallow marshes dominated by reed canary grass, cattail, giant reed or purple loosestrife.</p>	<p>4. These wetlands are usually so degraded that input of urban storm water may not have adverse impacts.</p>
<p>Note: All scientific and natural areas and pristine wetlands should be considered in this category regardless of wetland type.</p>			

NOTES: There will always be exceptions to the general categories listed above. Use best professional judgment. Pristine wetlands are those that show little disturbance from human activity.

*This is an excerpt from the Guidance for Evaluating Urban Storm Water and Snowmelt Runoff Impacts to Wetlands, Section IV, Figure IV-1.

2.24 Wetland Quality

Wetland quality was also evaluated using the Guidance for Evaluating Urban Storm Water and Snowmelt Runoff Impacts to Wetlands (May 1995 draft) by the State of Minnesota Storm Water Advisory Group. Wetland quality is discussed and evaluated in Section I of that document: Comprehensive Storm Water Management (see Appendix D).

Wetland quality and condition can be assessed one of two ways. An intensive, quantitative analysis may be used. This method would be appropriate to assess wetlands identified as high priority. A rapid or practical qualitative analysis based on best professional judgment would be appropriate for the evaluation of each wetland or complex in a watershed.

MNRAM, considered to be a rapid/practical strategy, was applied to all the wetlands above the Minnesota River bluff line. The MNRAM field data was compiled and used to determine wetland quality.

As noted in the guidance document “Wetland quality can be assessed as **excellent, moderate, or highly impacted** depending on the extent to which human activities have affected the wetland. Wetlands were evaluated using the following criteria.

Excellent Quality Wetlands: These wetlands remain in a least impacted condition and, as such, typically possess very diverse vegetative assemblages. Strata are well developed and composed of native species. Non-native species, if present, are infrequent and do not comprise significant relative cover percentiles. Wetlands which support rare, threatened, or endangered species are likely to be included as excellent quality wetlands.

Moderate Quality Wetlands: Areas that have been subject to varying degrees of human disturbances, but still provide important ecological wetland functions and values, are considered to be of moderate quality. An example would be a partially drained wetland complex composed of 60 percent cover of reed canary grass, and 40 percent cover of native species such as sedges. These wetlands often provide important wildlife habitat and water quality benefits.

Highly Impacted Wetlands: Areas that have been severely degraded such that they have little vegetation or the vegetation is dominated by non-native species or by monotypic stands of species such as cattails. Hydrologic and/or biological processes have been greatly altered and inputs of urban storm water will have minimal impacts. Example wetlands include abandoned gravel pits, nutrient loaded wetlands, storm water detention basins and dredged areas within wetlands that result in extreme hydrologic modifications.



2.25 Bloomington Management Classification

The management classification was developed to assist in the process of determining recommendations for actions to be taken for future management of the wetlands. The primary use classification of a wetland, its sensitivity to storm water runoff and the current wetland quality were considered in assigning a wetland to a management classification. The classification categories and an explanation of each follow.

Utilize: This category of wetlands includes those that are currently, or planned to be⁽¹⁾, used in a manner that will likely result in a reduction in the value of certain functions in order to increase the value of other functions of that wetland or another located downstream in the watershed. These wetlands are managed to insure that they perform their primary function. Manmade ponds and highly degraded wetlands would fall into this category. Other examples would be wetlands being used for storm water detention that experience a large bounce in water surface elevation or an extended period of inundation following a runoff event, and wetlands that provide significant treatment of storm water prior to conveying it to a higher quality wetland.

Apply Best Management Practices: Wetlands in this category have typically been impacted to some degree by development in their tributary watershed. However, the current functions and values are considered acceptable. Best management practices (BMP's) will be used in an effort to maintain these functions and values. Some examples of BMP's that will be utilized are: public education to increase the residents' knowledge and awareness of how fertilizers, pesticides and lawn maintenance can affect wetlands, implementation of programs to control invasive or exotic vegetation, providing sufficient vegetative buffer areas around wetlands, reviewing turf maintenance practices on city land and minimizing the amount of connected impervious surface in new development or redevelopment.

Preserve: Wetlands that are either of high quality, rare, or not connected to storm sewer and having a relatively undisturbed tributary drainage area would typically be placed in this category. In addition to BMP's, other measures would be taken to protect these wetlands. These would include requiring any future development to maintain predevelopment wetland hydrology and an adequate vegetative buffer. In cases where the wetlands are connected to the storm sewer system, infrastructure changes such as sedimentation basins, forebays, and trap manholes would be recommended.

⁽¹⁾ Any changes that would affect a MDNR Protected Waters wetland would have to be approved via MDNR permit.



3.00 Assessment of Needs

3.10 Introduction to Drainage Areas

The City of Bloomington inventoried 313 wetlands and manmade ponds above the Minnesota River bluff line. The majority of these wetlands are found in depressional areas in the gently to steeply rolling topography of the western two-thirds of Bloomington. (See Figure 1, Water Body/Drainage Area Map).

The City is approximately 39 square miles in size. It is divided into 22 drainage areas and the area below the Minnesota River bluff line (see Map 3.10). Twenty of the drainage areas contain wetlands. The inventoried drainage areas vary from 274 to 3108 acres in size and contain from 1 to 78 wetlands or manmade ponds. All the wetlands were inspected during the summer of 1995 by the City of Bloomington. Wetlands below the Minnesota River bluff line were not visited. See Section 7.10 for a discussion concerning these wetlands.

Following the field inventory, individual characteristics of each drainage area were identified including: the current land use, number and type of wetlands, functions and values of wetlands, and the receiving water bodies. The drainage area's overall wetland quality was determined by evaluating and summarizing the following: seven of the MNRAM functional value ratings, the Bloomington Primary Use and Management Classifications, and the MPCA's Wetland Sensitivity and Quality classifications.

The Minnesota River is the primary storm water receiving water for Bloomington. Ten of the drainage areas flow directly to the Minnesota River. Nine Mile Creek, which flows from northwestern to south-central Bloomington and into the Minnesota River, receives runoff from 8 of the drainage areas. The Bush Lake Drainage Area is landlocked with Bush Lake as the primary receiving water body. The Riley-Purgatory Drainage Area flows into Purgatory Creek, located in the City of Eden Prairie. Purgatory Creek flows into the Minnesota River. The remaining 2 drainage areas do not contain wetlands.

The recommended wetland improvements are summarized under each drainage area. Recommendations, based on inventory observations, were categorized and prioritized by the wetland advisory committee and City staff. Additional information on specific wetlands and manmade ponds can be found in the individual wetland inventory data sheet summary sheets in Appendix A.



3.11 11th Avenue Drainage Area

Watershed Description

The 11th Avenue Drainage Area is located on the southeastern border of Bloomington; south of 94th Street, east of Portland Avenue, west of Cedar Avenue, and north of the Minnesota River bluff line. Approximately 70 acres drain into Running Pond, the only basin within the drainage area. An additional 274 acres is conveyed directly to Long Meadow Lake via the storm sewer. Running Pond does not contain an outlet. Roughly 80 percent of the drainage area is residential, primarily single family homes. The remaining 20 percent is made up of City parks and Running Pond.

Drainage Area	344 acres
Primary Land Use	Residential
Percent Impervious	23%
Number of Natural Wetlands	1
Number of Manmade Ponds	0
Wetlands with Storm Sewer	1
Watershed District	Lower Minnesota River
Receiving Water Body	Minnesota River

Wetland Quality

Overall wetland quality for the 11th Avenue Drainage Area is rated as highly impacted. Running Pond, the only wetland within the drainage area, is rated as highly impacted for wetland quality based on Running Pond's high utilization for flood and storm water detention, 11.5 foot bounce for a 100-year storm event, and moderate floral diversity and wildlife habitat value ratings. Refer to Appendix A for field inventory data summary sheet for this wetland.



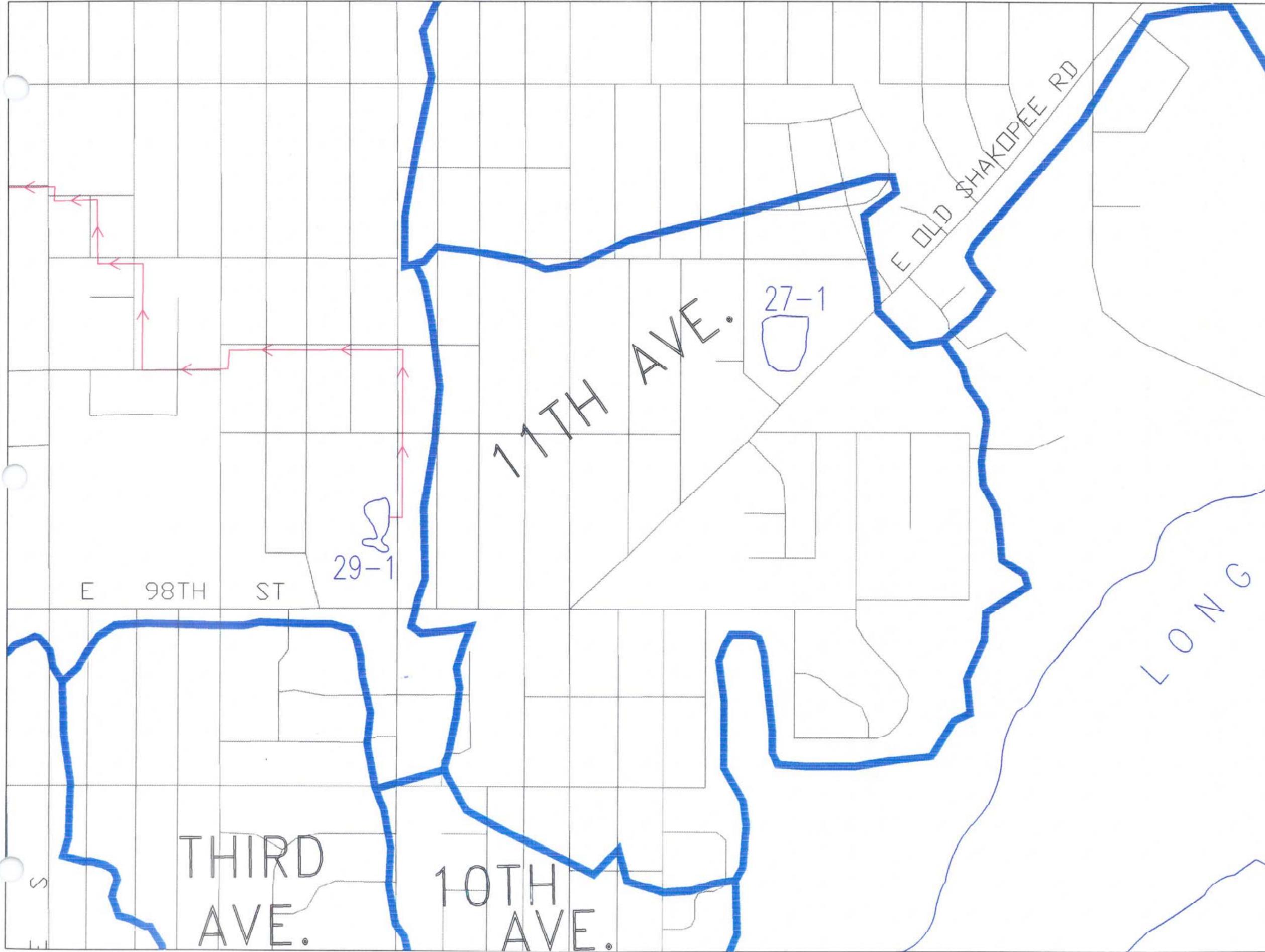
Summary of Recommendations
(11th Avenue Drainage Area)

Action Category		Quantity
A	Capital Improvements	1
B	Policy Changes & Public Education	0
C	Preserve	0

It is recommended that the storm sewer to Running Pond be rerouted to convey low flows to a sedimentation basin to be added at the inlet. In addition, a review of the City park maintenance mowing practices is recommended. See Appendix A for specific recommendations.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Reroute Storm Sewer Sedimentation Basin	Running Pond (27-01)





LEGEND

- 27-1 Wetland ID #'s
 - 1078B DNR Protected Water #'s
 - Storm Sewer
 - - - Overland Flow
 - Drainage Area Boundary
 - Wetland Boundaries *
 - Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.12 Brookside Drainage Area

Watershed Description

The Brookside Drainage Area is located in central Bloomington east of France Avenue; west of Xerxes Avenue, south of 98th Street, and north of West Old Shakopee Road. It drains approximately 325 acres. Three basins occupy the drainage area with Brookside Pond as the primary storm water receiving basin. From Brookside, storm water flows to the Upper Nine Mile Creek Drainage Area and eventually into Nine Mile Creek. Roughly 80 percent of the area is single family homes, apartments, and townhomes. The remaining 20 percent is made up of wetlands and City parks.

Drainage Area	325
Primary Land Use	Residential
Percent Impervious	27%
Number of Wetlands	3
Number of Manmade Ponds	0
Wetlands with Storm Sewer	3
Watershed District	Nine Mile Creek
Receiving Water Body	Nine Mile Creek

Wetland Quality

Overall wetland quality for the Brookside Drainage Area is rated as highly impacted to moderate. All three wetlands are type 5 wetlands that are highly utilized for flood and storm water detention. Human disturbance is significant. Floral diversity and wildlife habitat values are rated as low. Nearly 100 percent of the upland buffer and a portion of the wetland is mowed on two of the three wetlands. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Brookside Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	2
B	Policy Changes & Public Education	1
C	Preserve	0

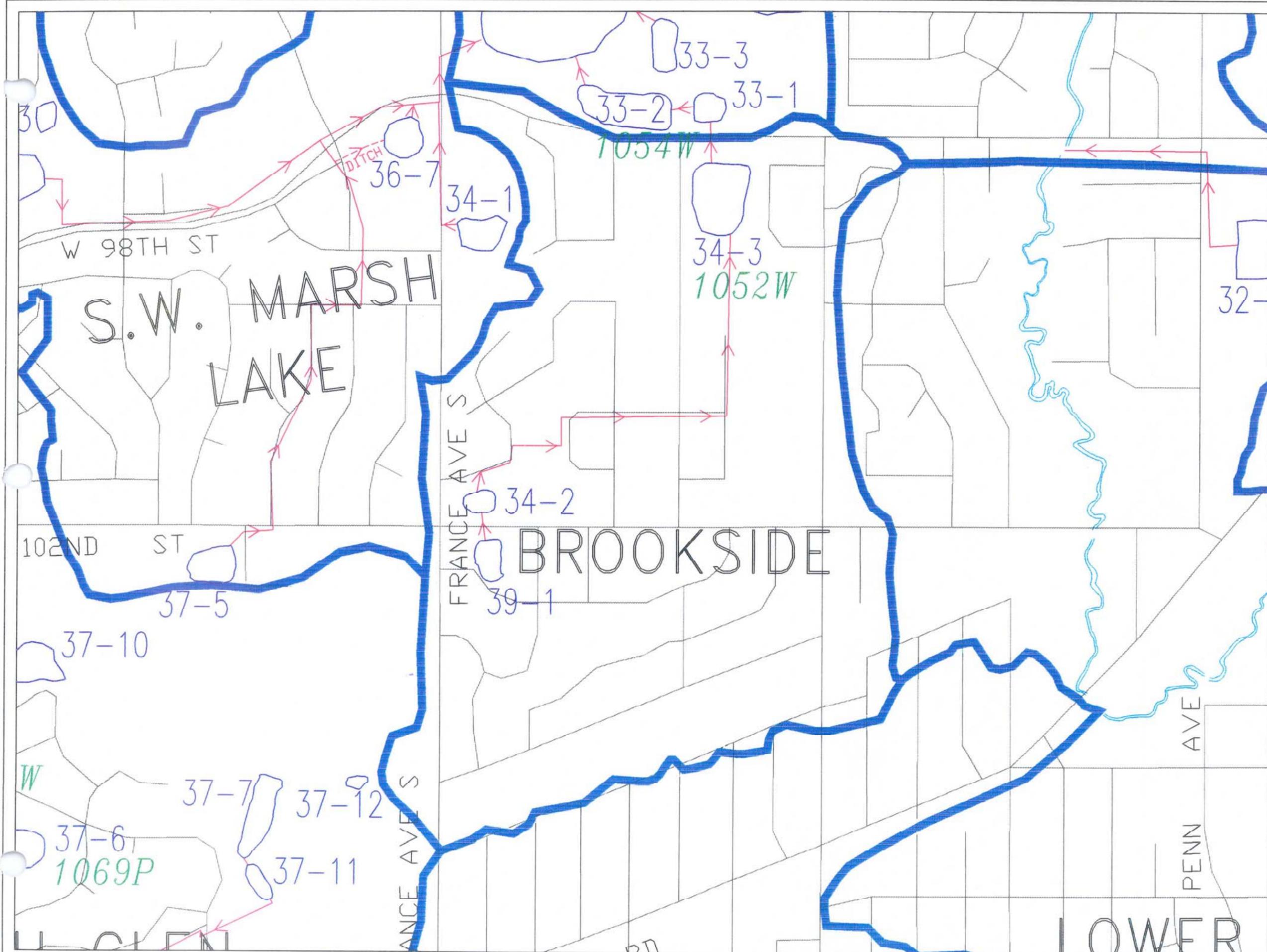
Target and general education is recommended for all three basins. See Appendix A for specific recommendations.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Trap Manhole	Canterbury Oaks Pond (39-01)
Sedimentation Basins	Brookside Pond (34-03)



MAP 3.12

DRAINAGE AREA:
BROOKSIDE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.13 Bush Lake Drainage Area

Watershed Description

The Bush Lake Drainage Area is located in northwestern Bloomington; east of Highway 169 and south of Highwood Drive. It drains approximately 1285 acres. Bush Lake, the primary storm water storage basin, currently does not have an outlet. Roughly 75 percent of the drainage area is conservation area, City/County parks, or lakes/wetlands. The remaining 25 percent is residential; primarily single family homes.

Drainage Area	1285 acres
Primary Land Use	Hyland Park Preserve/Bush Lake
Percent Impervious	19%
Number of Natural Wetlands	56
Number of Manmade Ponds	8
Wetlands with Storm Sewer	27
Watershed District	Nine Mile Creek
Receiving Water body	Bush Lake

Wetland Quality

Overall wetland quality for the Bush Lake Drainage Area is rated as moderate to excellent. Highly impacted natural wetlands, comprising 14 percent of the wetlands, are generally rated as low in floral diversity ratings, low to moderate wildlife habitat ratings, and moderate to high in flood and storm water. Wetlands rated moderate in wetland quality, comprising 48 percent of the wetlands, are rated low to moderate in floral diversity and wildlife habitat; have experienced some degree of human disturbance; and maintain non-native or monotypic vegetation. These wetlands still provide wildlife habitat and water quality protection. Wetlands with an excellent rating in wetland quality, comprise 25 percent of the total wetlands. Over half of these wetlands are located in City or County parks with an undeveloped upland buffer area. The majority of these wetlands are rated high to excellent in floral diversity and wildlife habitat. Manmade ponds, comprising the additional 13 percent, are not rated. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Bush Lake Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	3
B	Policy Changes & Public Education	21
C	Preserve	11
H	Hyland Park Preserve	29

A number of recommended actions are common to wetlands found in all three action categories. These recommendations include target and general education programs; review of City maintenance practices and chemical treatment policies; and removal or control of purple loosestrife and buckthorn. See Appendix A for specific recommendations.

Purple loosestrife has infested three wetlands, hand removal is recommended in most locations, see Section 4.47 and Table 4.47a. Buckthorn has also been identified in three wetlands. See Section 4.47 and Table 4.47b for recommended control measures.

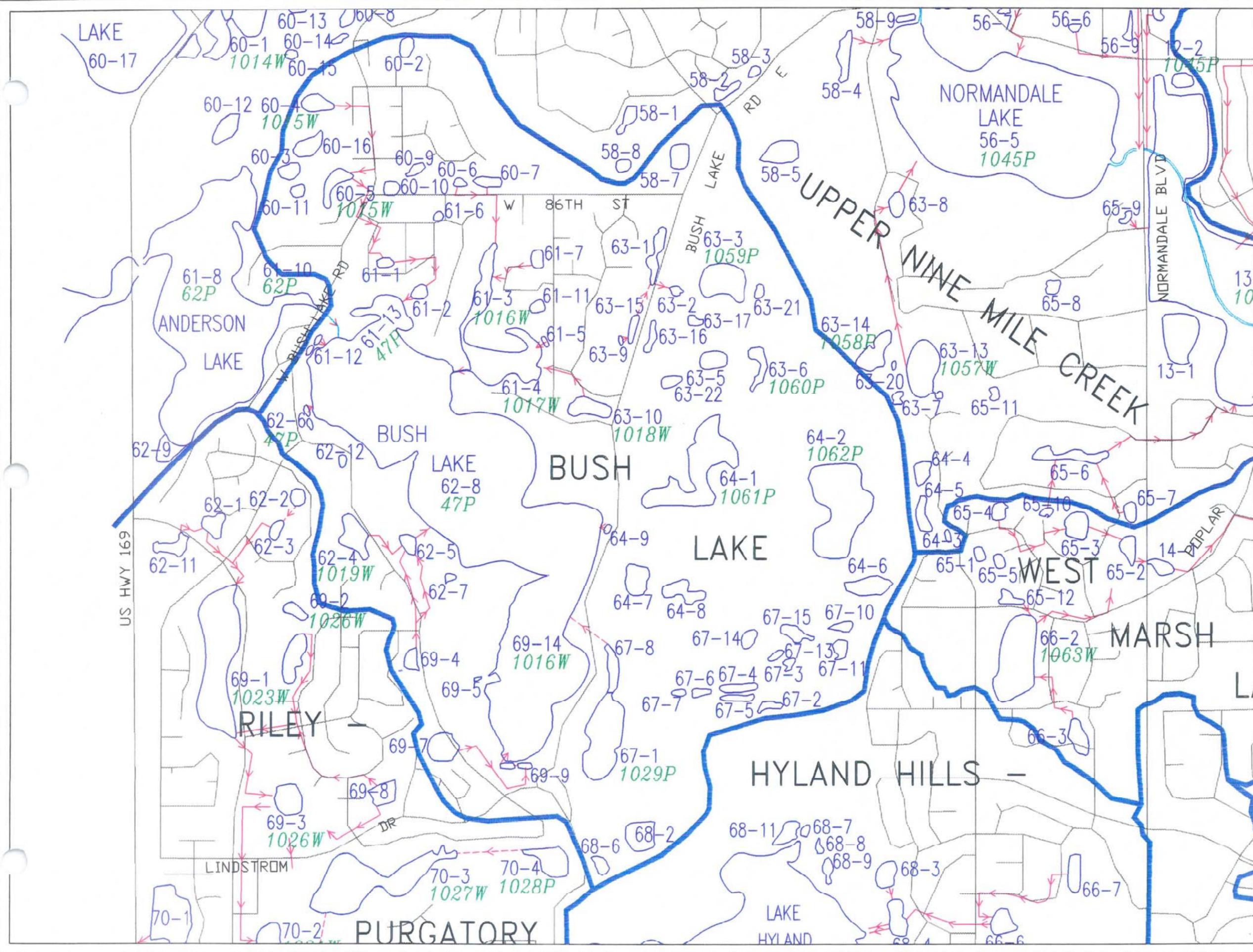
Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Trap Manhole	Bogen Pond (60-05)
Petition Nine Mile Creek Watershed District for basin-wide water quality study	Bush Lake (62-08)
Replace Outlet Structure	Utah Pond One (61-02)

Wetlands in the Hyland Park Preserve (**H**) are managed by Hennepin County Parks. Hennepin County Parks will prepare a management plan for these wetlands.



MAP 3.13

DRAINAGE AREA:
BUSH LAKE



LEGEND

- 27-1 Wetland ID #'s
 - 1078B DNR Protected Water #'s
 - Storm Sewer
 - - - Overland Flow
 - Drainage Area Boundary
 - Wetland Boundaries *
 - Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.14 France Avenue Sump Drainage Area

Watershed Description

The France Avenue Sump Drainage Area is located in south-central Bloomington; north of Overlook Drive, south of 108th Street, east of Johnson Avenue, and west of Xerxes Avenue. It drains approximately 274 acres. Only two basins occupy the drainage area. The France Avenue Sump drains to Coleman Lake and eventually into the Minnesota River. Dwan Golf Course Pond does not contain an outlet. Roughly 70 percent of the drainage area is residential; primarily single family homes. The remaining 30 percent is made up of parks, Dwan Golf Course, and wetlands.

Drainage Area	274 acres
Primary Land Use	Residential
Percent Impervious	23%
Number of Wetlands	1
Number of Manmade Ponds	1
Wetlands with Storm Sewer	2
Watershed District	Lower Minnesota River
Receiving Water Body	Minnesota River

Wetland Quality

Overall wetland quality for the France Avenue Sump Drainage Area is rated as moderate. France Avenue Sump, the only natural wetland within the drainage area, is rated as moderate due to high utilization as a flood and storm water detention basin, moderate floral diversity and wildlife habitat value ratings, and extensive mowing of the upland buffer zone. Refer to Appendix A for field inventory data summary sheets for each wetland.



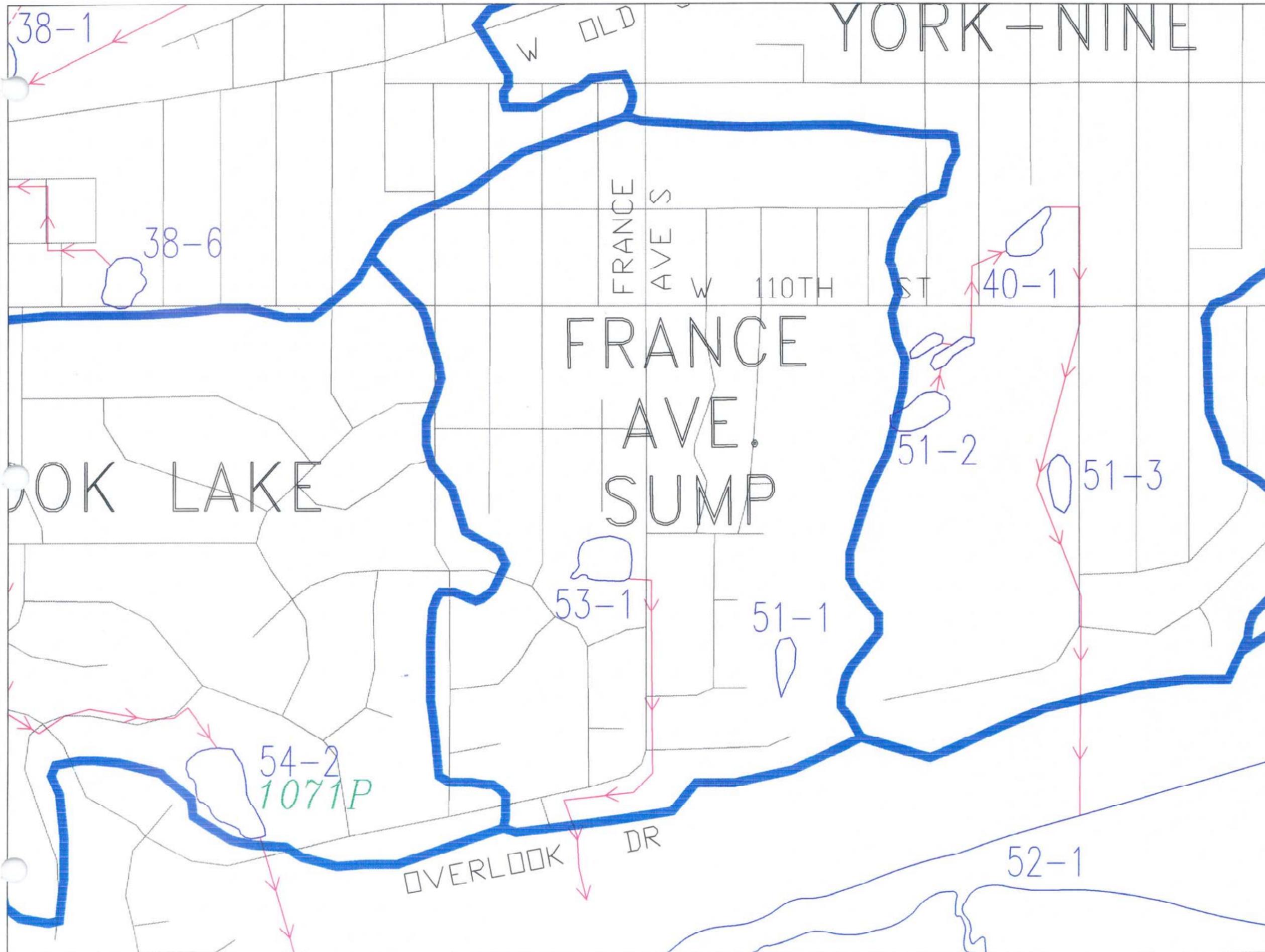
Summary of Recommendations
(France Avenue Sump Drainage Area)

Action Category		Number of Wetlands
A	Capital Improvements	0
B	Policy Changes & Public Education	2
C	Preserve	0

Dwan Golf Course Pond, West and France Avenue Sump are recommended for target and general education. See Appendix A for specific recommendations.



DRAINAGE AREA:
FRANCE AVE.
SUMP



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.15 Hampshire Pond Drainage Area

Watershed Description

The Hampshire Pond Drainage Area is located in the southwestern corner of Bloomington; east of Normandale Boulevard and south of 102nd Street. It receives drainage from approximately 1307 acres in its direct drainage area and storm water overflow from the Colorado Pond lift station, which is located within the Hyland Hills and Colorado Pond Drainage Area. Hampshire Pond, the primary storm water storage basin within the drainage area, outlets to the Minnesota River. Roughly 70 percent of the drainage area is composed of single family homes, apartments, townhomes, and Minnesota Valley Country Club golf course. Hyland Park and wetlands comprise the remaining 30 percent.

Drainage Area	1307 acres
Primary Land Use	Residential
Percent Impervious	38%
Number of Natural Wetlands	10
Number of Manmade Ponds	8
Wetlands with Storm Sewer	12
Watershed District	Lower Minnesota River
Receiving Water Body	Minnesota River

Wetland Quality

Overall wetland quality for the Hampshire Pond Drainage Area is rated as moderate to excellent. Two wetlands are rated as highly impacted due to low to moderate floral diversity and wildlife habitat value ratings, high utilization for flood and storm water detention, and significant human degradation. The five wetlands rated as moderate in water quality are low to moderate in floral diversity value and moderate to high in wildlife habitat value. While most of these wetlands have experienced some human impacts, such as the addition of storm sewers and invasion of invasive/exotic species, they still provide some wildlife habitat value. Three wetlands are rated as excellent due to moderate to excellent floral diversity and wildlife habitat ratings, classification as scenic habitat, and undisturbed upland buffer. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Hampshire Pond Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	1
B	Policy Changes & Public Education	15
C	Preserve	2

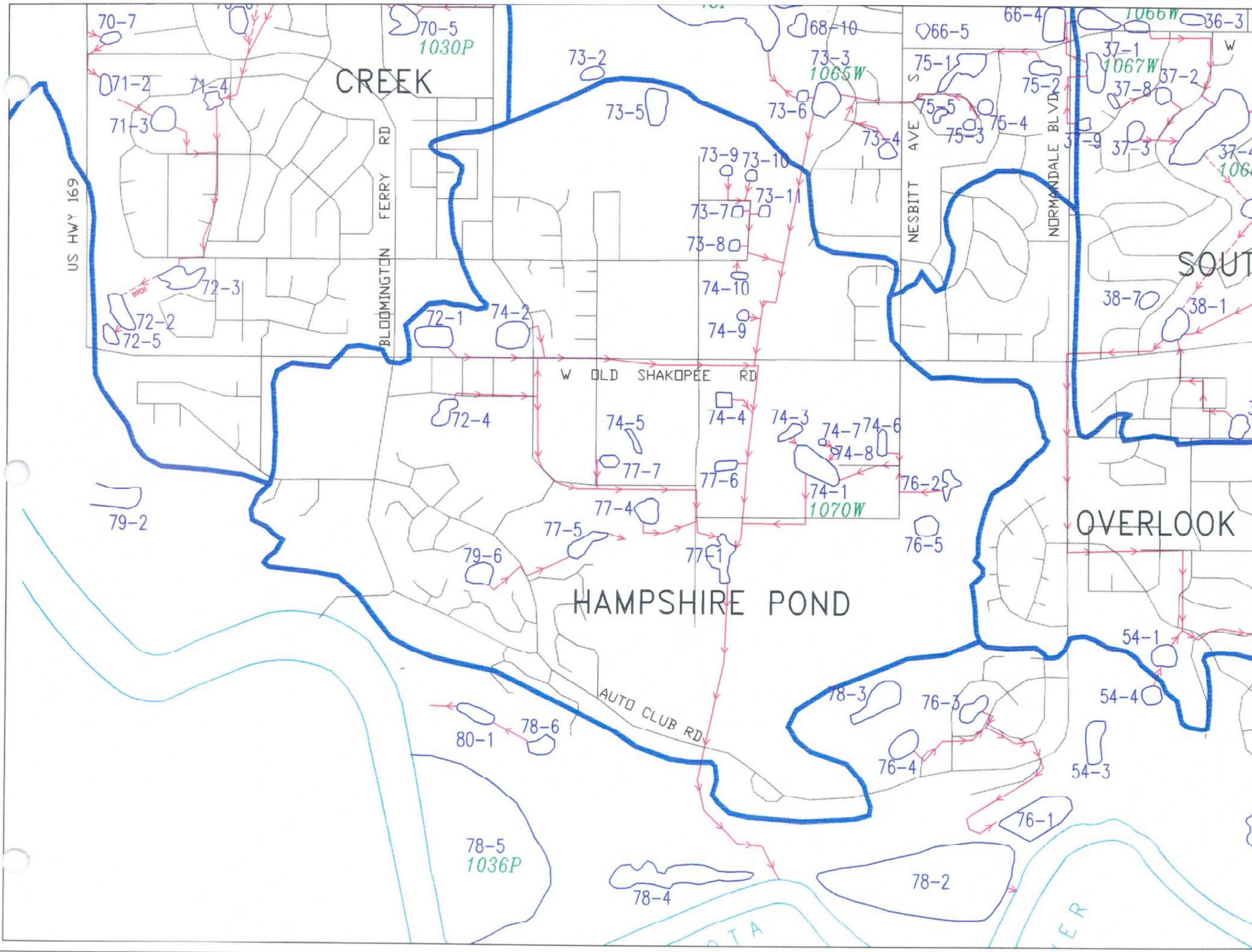
Most of the 18 wetlands are recommended for target and/or general education. See Appendix A for specific recommendations.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Trap Manhole	Minnesota Bluffs Pond (79-06)



MAP 3.15

DRAINAGE AREA: HAMPSHIRE POND



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.16 Hopkins Road Drainage Area

Watershed Description

The Hopkins Road Drainage Area is located in southeastern Bloomington; East of I-35W, south of East Old Shakopee Road, west of Nicollet Avenue, and north of the Minnesota River bluff line. It drains approximately 411 acres. One natural wetland and one manmade pond are located within the drainage area, Overlook Manor Pond and Honeywell Pond, respectively. Both water bodies drain directly into the Minnesota River. Roughly 90 percent of the drainage area is residential including single and multiple family homes. City parks, retail commercial, and wetlands comprise the remaining 10 percent of the drainage area.

Drainage Area	411 acres
Primary Land Use	Residential
Percent Impervious	46%
Number of Natural Wetlands	1
Number of Manmade Ponds	1
Wetlands with Storm Sewer	2
Watershed District	Lower Minnesota River
Receiving Water Body	Minnesota River

Wetland Quality

Overlook Manor Pond, the only natural wetland with the Hopkins Road Drainage Area, is rated as highly impacted in water quality. The highly impacted rating is based on Overlook Manor Pond's moderate ratings in floral diversity and wildlife habitat, mowed upland buffer and wetland, and high utilization as a flood and storm water detention basin. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Hopkins Road)**

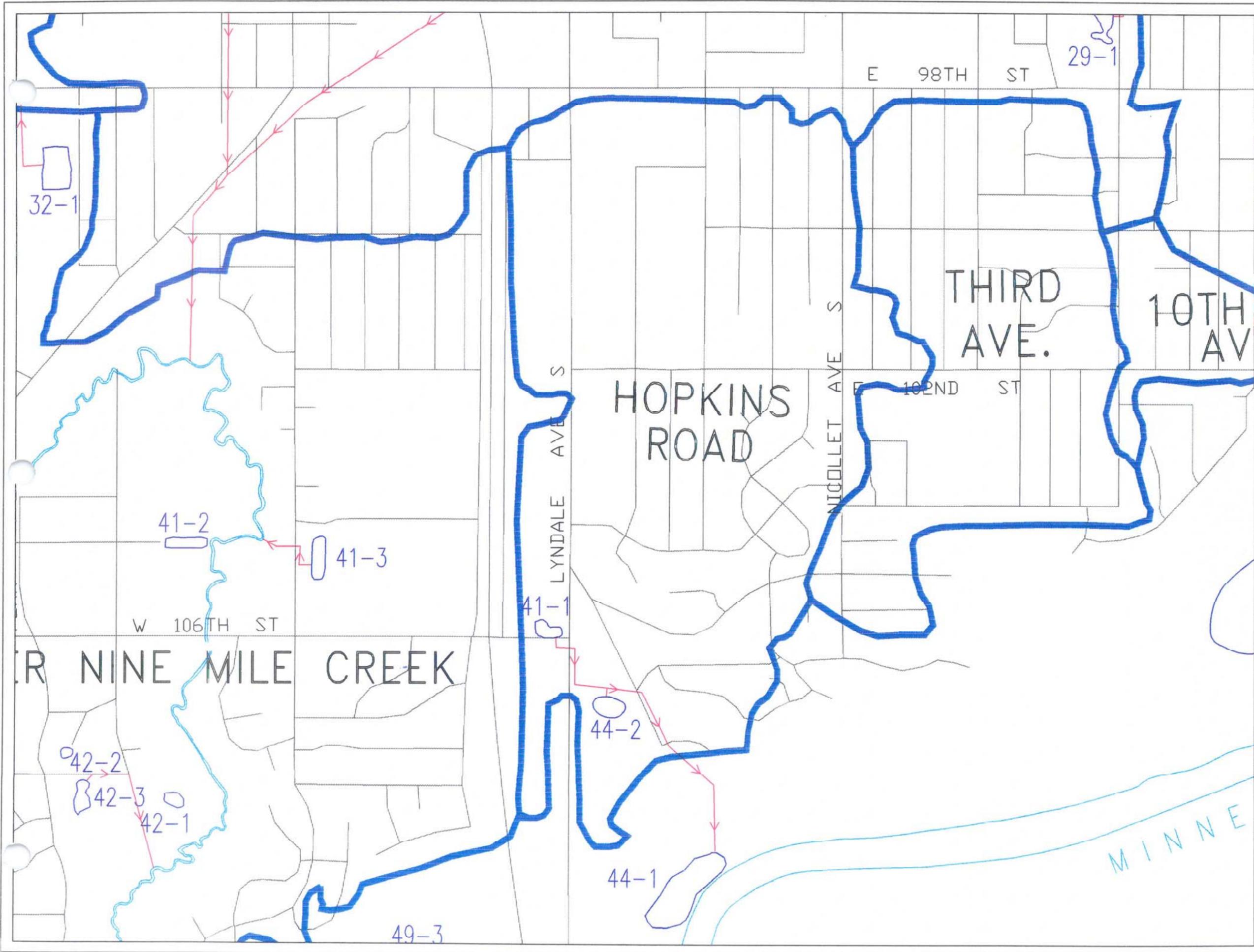
Action Category		Number of Wetlands
A	Capital Improvements	0
B	Policy Changes & Public Education	2
C	Preserve	0

Overlook Manor Pond (41-01) and Honeywell Pond (44-02) are recommended for target and general education. See Appendix A for specific recommendations.



MAP 3.16

DRAINAGE AREA:
HOPKINS
ROAD



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.17 Hyland Hills - Colorado Pond Drainage Area

Watershed Description

The Hyland Hills - Colorado Pond Drainage Area is located in west-central Bloomington; west of Normandale Boulevard and east of Bush Lake Road from approximately 94th Street to 106th Street. It drains approximately 830 acres. The drainage area has two primary storm water storage basins. Hyland Lake receives storm water from the upper drainage area and flows to Colorado Pond, which receives most of the storm water from the lower portion of the drainage basin. The Colorado Pond outlet is a lift station that flows to Hampshire Pond, in the Hampshire Pond Drainage Area, and eventually into the Minnesota River. Roughly 40 percent of the drainage area is residential, including single and multiple family homes. The remainder of the area is Hyland Park Preserve and Hyland Golf Course.

Drainage Area	830 acres
Primary Land Use	Residential, Hyland Park Preserve
Percent Impervious	21%
Number of Natural Wetlands	17
Number of Manmade Ponds	5
Wetlands with Storm Sewer	16
Watershed District	Riley-Purgatory-Bluff Creek
Receiving Water Bodies	Minnesota River via Hampshire Pond

Wetland Quality

Overall wetland quality for the Hyland Hills - Colorado Pond Drainage Area is rated as moderate. Three wetlands are rated highly impacted in wetland quality due to low floral diversity value ratings, extensive mowing of the upland buffer zone, a history of chemical treatment, and significant human disturbance. Ten wetlands are rated as moderate in water quality due to low to moderate floral diversity value ratings, moderate to high wildlife habitat value ratings, high utilization for flood and storm water detention basins, a history of chemical treatment, and natural upland buffer zones. Half of the moderately rated wetlands are located in Hyland Park. The four wetlands rated as excellent in wetland quality are moderate to high in floral diversity value ratings and contain a natural, undisturbed buffer zone. Refer to Appendix A for field inventory data summary sheets for each wetland.



Summary of Recommendations
(Hyland Hills-Colorado Pond Drainage Area)

Action Category		Number of Wetlands
A	Capital Improvements	2
B	Policy Changes & Public Education	9
C	Preserve	2
H	Hyland Park Preserve	9

A number of recommended actions are common to wetlands in all three action categories. These recommendations include target and/or general education as well as review of City maintenance practices and chemical treatment policies. Target education focuses education programs on buffer strips, lawn maintenance practices, trash removal, erosion control, mowing, and chemical treatment. See Appendix A for specific recommendations.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Trap Manhole	Timberglade Pond, N (75-01) Berkshire Pond (75-02)

Wetlands in the Hyland Park Preserve (**H**) are managed by Hennepin County Parks. Hennepin County Parks will prepare a management plan for these wetlands.

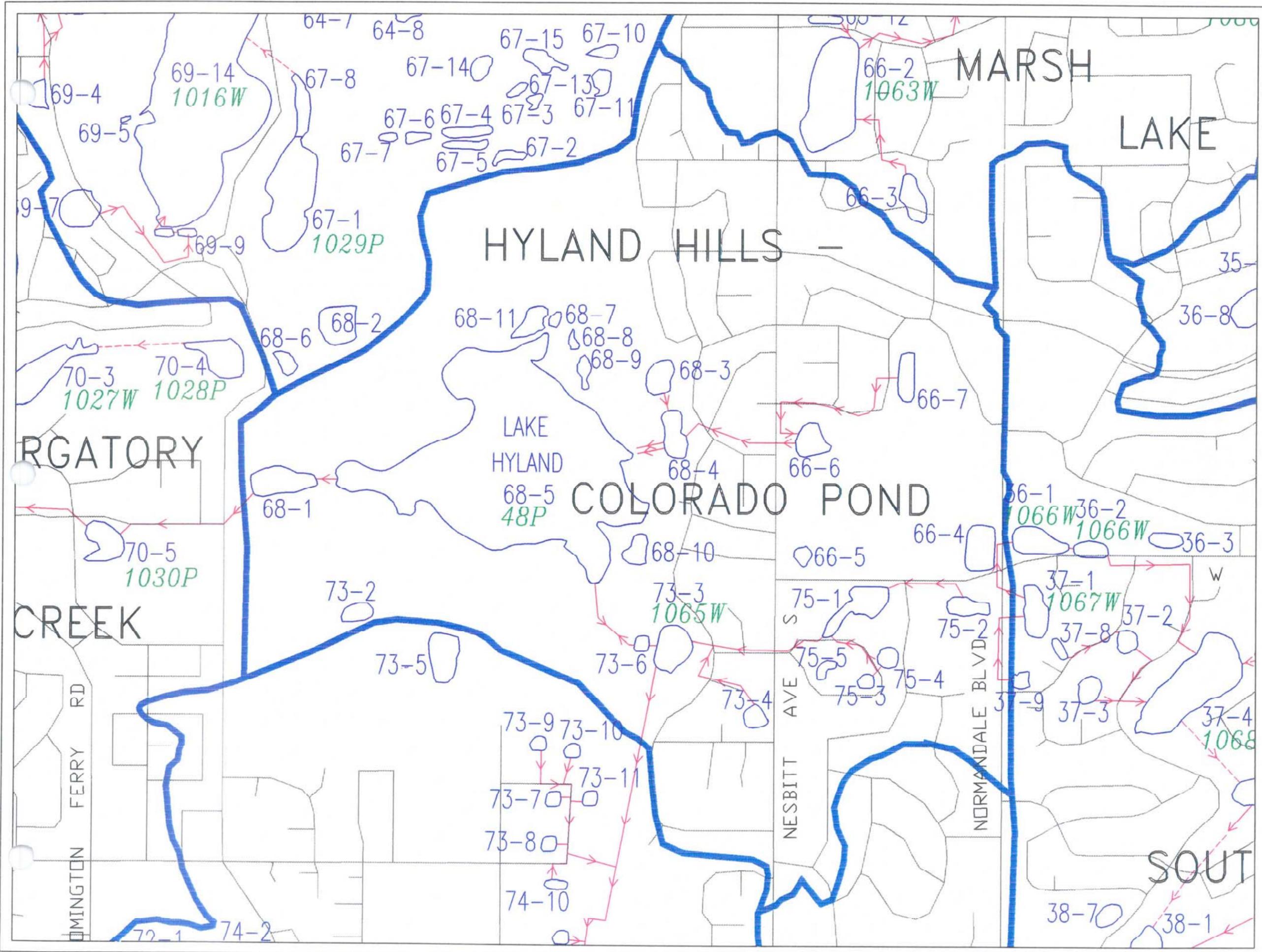
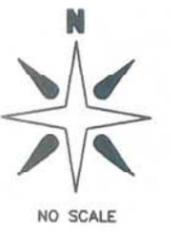


MAP 3.17

DRAINAGE AREA:
HYLAND
HILLS —
COLORADO
POND

LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.18 Lower Nine Mile Creek Drainage Area

Watershed Description

The Lower Nine Mile Creek Drainage Area is located in south-central Bloomington; east of Xerxes Avenue, west of I-35W and south of West 98th Street. It drains approximately 1137 acres. Nine Mile Creek flows through the center of the drainage area. Three of the basins are isolated, the other two flow directly to Nine Mile Creek. Roughly 75 percent of the drainage area is residential, including single and multiple family homes. The remaining 25 percent is comprised of City Parks, Nine Mile Creek, and wetlands.

Drainage Area	1137 acres
Primary Land Use	Residential
Percent Impervious	30%
Number of Wetlands	4
Number of Manmade Ponds	1
Wetlands with Storm Sewer	2
Watershed District	Nine Mile Creek
Receiving Water Body	Nine Mile Creek

Wetland Quality

Overall wetland quality for the Lower Nine Mile Creek Drainage Area is rated as excellent. One wetland, Humboldt Pond (41-03), is rated as highly impacted due to low floral diversity and wildlife habitat value ratings, removal of hydrology, utilization as an ice rink, and extensive mowing of upland buffer and wetland. The three wetlands rated as excellent are high in floral diversity and wildlife habitat value ratings, contain scarce wetland types, and contain undisturbed upland buffer zones. Refer to Appendix A for field inventory data summary sheets for each wetland.



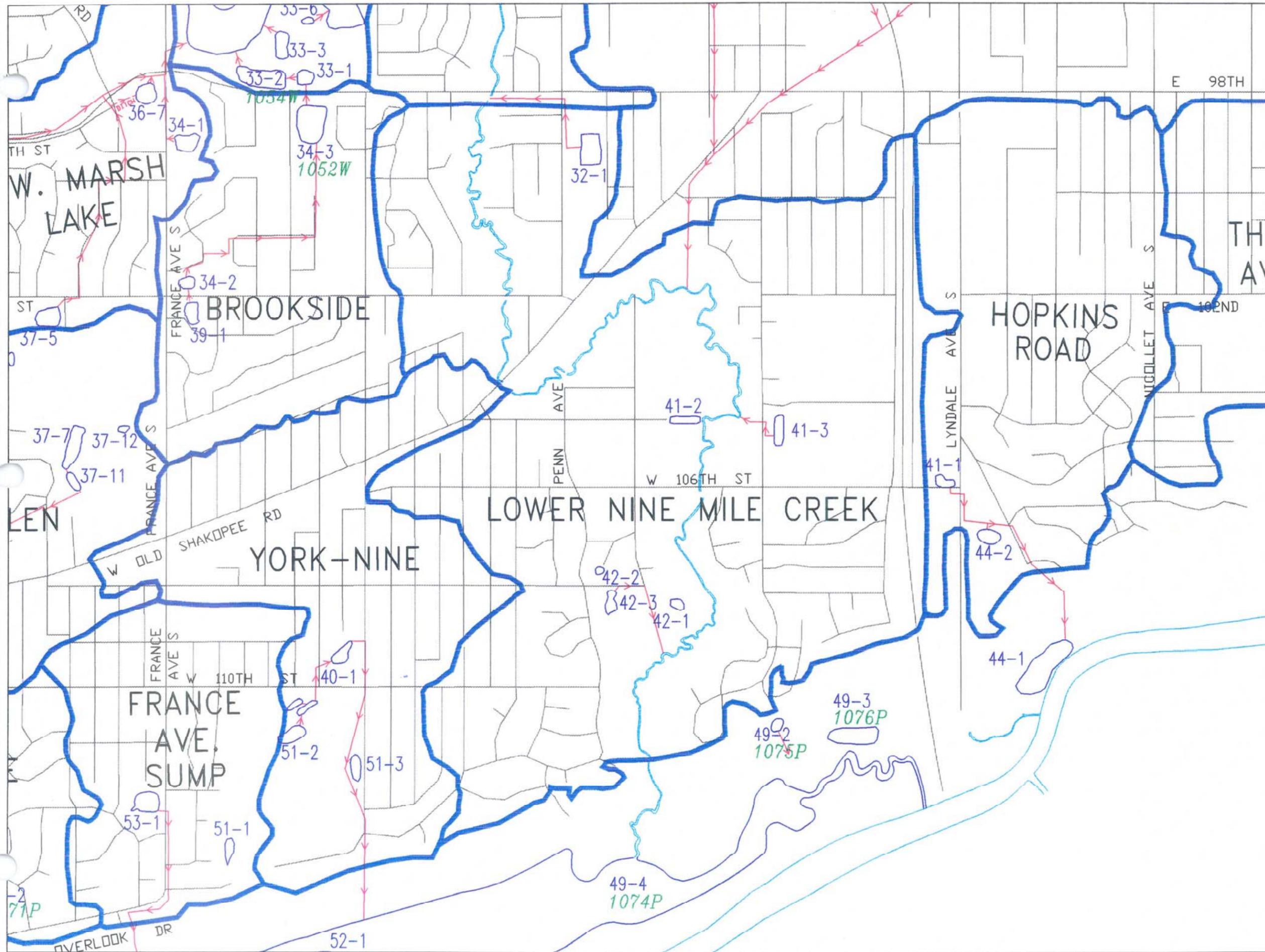
Summary of Recommendations
(Lower Nine Mile Creek Drainage Area)

Action Category		Number of Wetlands
A	Capital Improvements	0
B	Policy Changes & Public Education	3
C	Preserve	2

Target and/or general education is recommended for four of the five wetlands. The remaining manmade pond, Gideon Pond (32-01), is recommended for routine maintenance. Morgan Hollow (42-02) would be more easily preserved if it was in single ownership. It is recommended that the existing owners be approached about replatting (at City expense) to designate the wetland area on each lot. A neighborhood wetland preservation group could be encouraged via the Adopt-A-Wetland program.

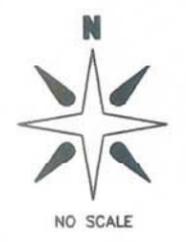


DRAINAGE AREA:
LOWER NINE
MILE CREEK



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.19 Mall of America Drainage Area

Watershed Description

The Mall of America Drainage Area is located in the northeast corner of Bloomington; south of I-494 and east of Cedar Avenue. Draining approximately 645 acres, the drainage area does not contain any natural wetlands. The three water bodies are manmade ponds which outlet to Pond “C”, Bass Ponds, or Long Meadow Lake (which are located within the Minnesota Valley National Wildlife Refuge) before reaching the Minnesota River. The drainage area is nearly 100 percent developed, including the highly commercial area surrounding the Mall of America, single and multiple family homes, and office/warehouse space.

Drainage Area	645 acres
Primary Land Use	Commercial
Percent Impervious	69%
Number of Natural Wetlands	0
Number of Manmade Ponds	3
Wetlands with Storm Sewer	3
Watershed District	Lower Minnesota River
Receiving Water Body	Minnesota River

Wetland Quality

Because the Mall of America Drainage Area contains only manmade ponds, the wetland quality was not rated. Refer to Appendix A for specifics on the ponds.



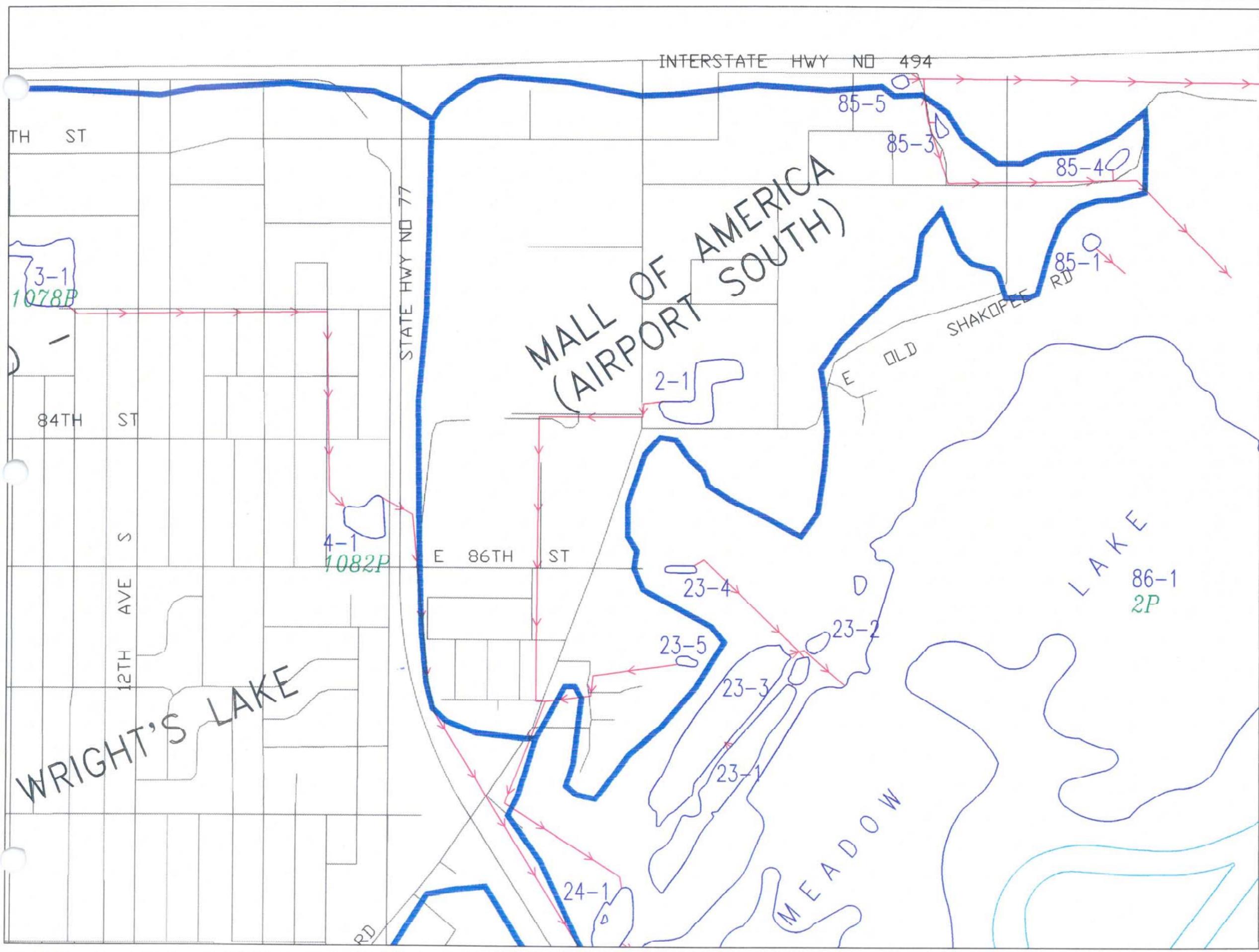
Summary of Recommendations
(Mall of America Drainage Area)

Action Category		Number of Wetlands
A	Capital Improvements	0
B	Policy Changes & Public Education	3
C	Preserve	0

All three basins were created for storm water storage. They are recommended for routine maintenance. See Appendix A for specific recommendations.



DRAINAGE AREA:
MALL OF AMERICA



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.20 Overlook Lake Drainage Area

Watershed Description

The Overlook Lake Drainage Area is located in southwestern Bloomington; west of France Avenue, east of Normandale, south of 106th Street, and north of Overlook Drive. It receives drainage from approximately 504 acres within the drainage basin and overflow from the South Glen Drainage Area via the South Glen lift station. Of the two basins within the drainage area, Overlook Lake serves as the primary storm water storage basin and outlets to the Minnesota River. Roughly 70 percent of the area is comprised of single family homes. The remaining 30 percent is conservation area, industrial, and wetlands.

Drainage Area	504 acres
Primary Land Use	Residential
Percent Impervious	33%
Number of Natural Wetlands	2
Number of Manmade Ponds	0
Wetlands with Storm Sewer	2
Watershed District	Lower Minnesota River
Receiving Water Body	Minnesota River

Wetland Quality

Overall wetland quality for the Overlook Lake Drainage Area is rated as moderate. Both wetlands in the drainage area are rated as moderate due to moderate floral diversity value ratings, moderate to high wildlife habitat value ratings, high utilization as flood and storm water detention basins, and significant human disturbance. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Overlook Lake Drainage Area)**

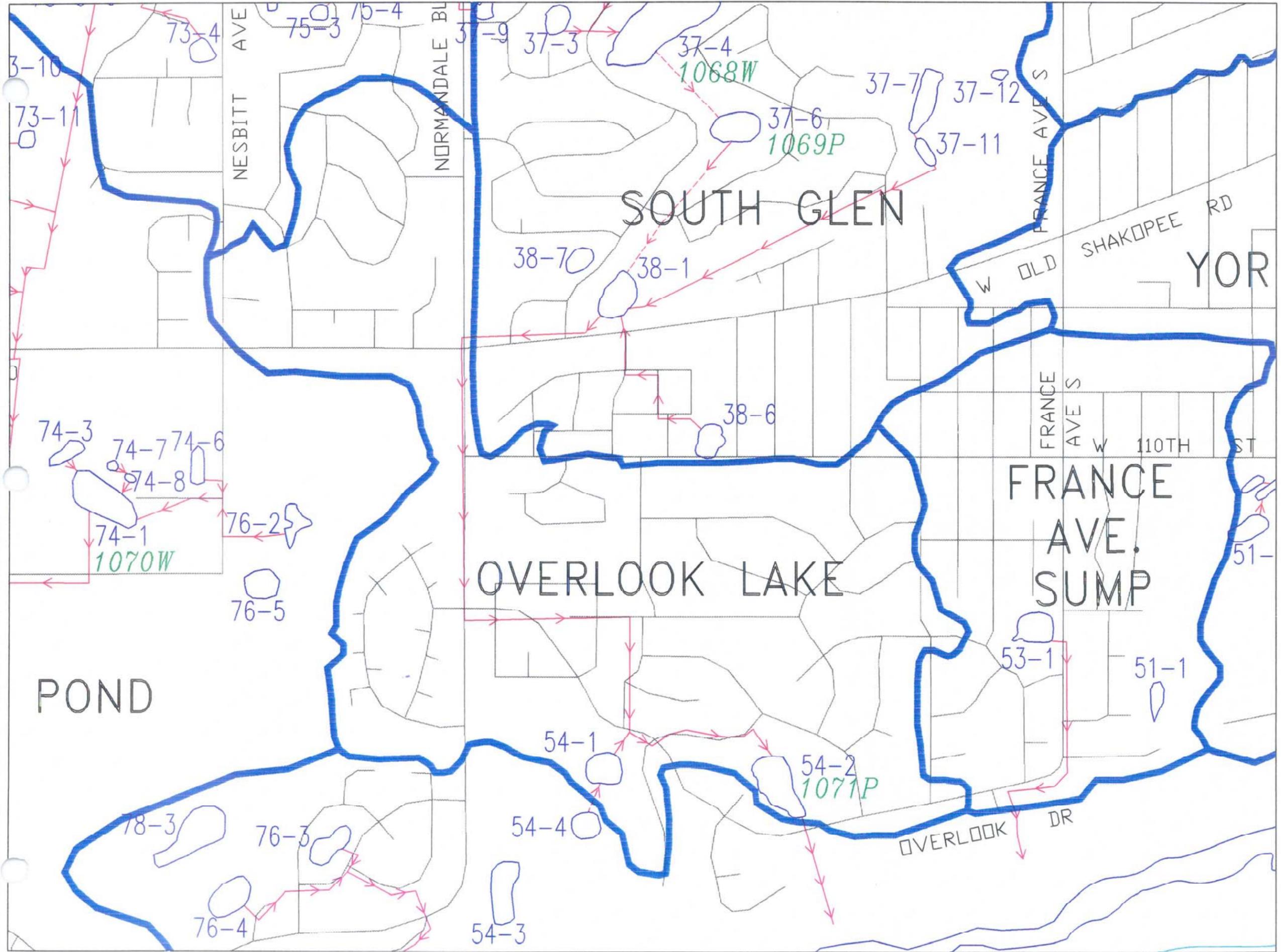
Action Category		Number of Wetlands
A	Capital Improvements	0
B	Policy Changes & Public Education	2
C	Preserve	0

Target and/or general education has been recommended for Masonic Home Pond North (54-01) and Overlook Lake (54-02). See Appendix A for specific recommendations.



MAP 3.20

DRAINAGE AREA:
OVERLOOK
LAKE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.21 Oxboro Lake Drainage Area

Watershed Description

The Oxboro Lake Drainage Area is located in east-central Bloomington; south of West 78th Street, east of I-35W, north of Old Shakopee Road, and west of Portland Avenue. It drains approximately 2035 acres, making it the second largest drainage area in the City. Oxboro Lake serves as the primary storm water storage basin, with Nine Mile Creek the receiving watercourse. Roughly 90 percent of the drainage area is comprised of single and multiple family and the I-35W corridor. Parks and wetlands comprise the remaining 10 percent of the drainage area.

Drainage Area	2035 acres
Primary Land Use	Residential
Percent Impervious	51%
Number of Natural Wetlands	4
Number of Manmade Ponds	5
Wetlands with Storm Sewer	8
Watershed District	Nine Mile Creek
Receiving Water Body	Nine Mile Creek

Wetland Quality

Overall wetland quality for the Oxboro Lake Drainage Area is rated as highly impacted. All four natural wetlands are rated as highly impacted due to low to moderate floral diversity and wildlife habitat value ratings, high utilization as flood and storm water detention basins, extensive mowing of the upland buffer zone, and significant human disturbance. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Oxboro Lake Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	2
B	Policy Changes & Public Education	7
C	Preserve	0

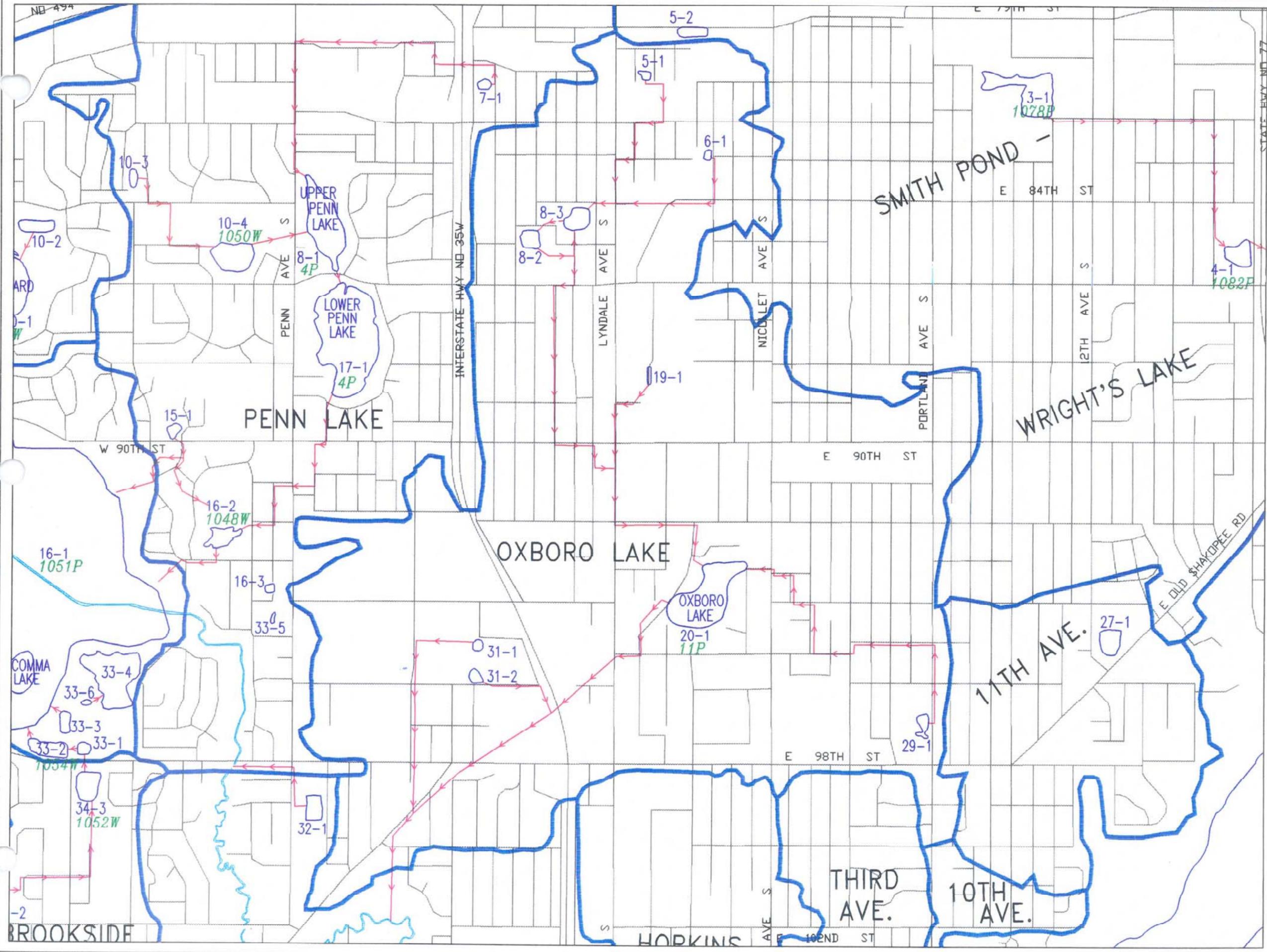
A number of recommended actions are common to wetlands in both action categories. Target education programs focus on buffer strips, lawn maintenance, and park maintenance. The five manmade ponds, constructed for water quality, are recommended for routine maintenance. Lower Bryant (08-02) and Upper Bryant (08-03) are recommended for future water quality monitoring sites. See Appendix A for specific recommendations.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Trap Manhole(s)	Oxboro Lake (20-01)
Repair Existing Forebays	Upper Bryant (08-02)



MAP 3.21

DRAINAGE AREA: OXBORO LAKE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.22 Penn Lake Drainage Area

Watershed Description

The Penn Lake drainage area is located in north central Bloomington; west of I-35W, east of Xerxes Avenue, north of 98th Street, and south of I-494. It drains approximately 1540 acres including 340 acres from the City of Richfield which flows to Upper Penn Lake. The drainage area outlets to Nine Mile Creek. Roughly 80 percent of the drainage area contains residential including single and multiple family homes, retail space, and office/warehouse space. The remaining 20 percent is park and wetlands.

Drainage Area	1540 acres
Primary Land Use	Residential/Commercial
Percent Impervious	39%
Number of Natural Wetlands	8
Number of Manmade Ponds	1
Wetlands with Storm Sewer	8
Watershed District	Nine Mile Creek
Receiving Water Body	Nine Mile Creek

Wetland Quality

Overall wetland quality for the Penn Lake Drainage Area is rated as highly impacted to moderate. Four wetlands are rated highly impacted due to low floral diversity value ratings, moderate wildlife habitat value ratings, high utilization as flood and storm water detention basins, a history of chemical treatment, extensive mowing of the upland buffer zone, and significant human disturbance. The remaining four wetlands are rated as moderate in water quality due to low to moderate floral diversity and wildlife habitat value ratings, mowing of the upland buffer zone, and moderate human disturbance. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Penn Lake Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	2
B	Policy Changes & Public Education	7
C	Preserve	0

A number of recommended actions are common to wetlands found in both action categories. Recommendations include target and/or general education, routine maintenance, and review of City park maintenance practices. Educational programs focus on mowing of the buffer and wetland, using fertilizer and pesticides, and mowing of public land by homeowners. Penn Hollow North (16-03) has been recommended for erosion control measures and trash removal. See Appendix A for specific recommendations.

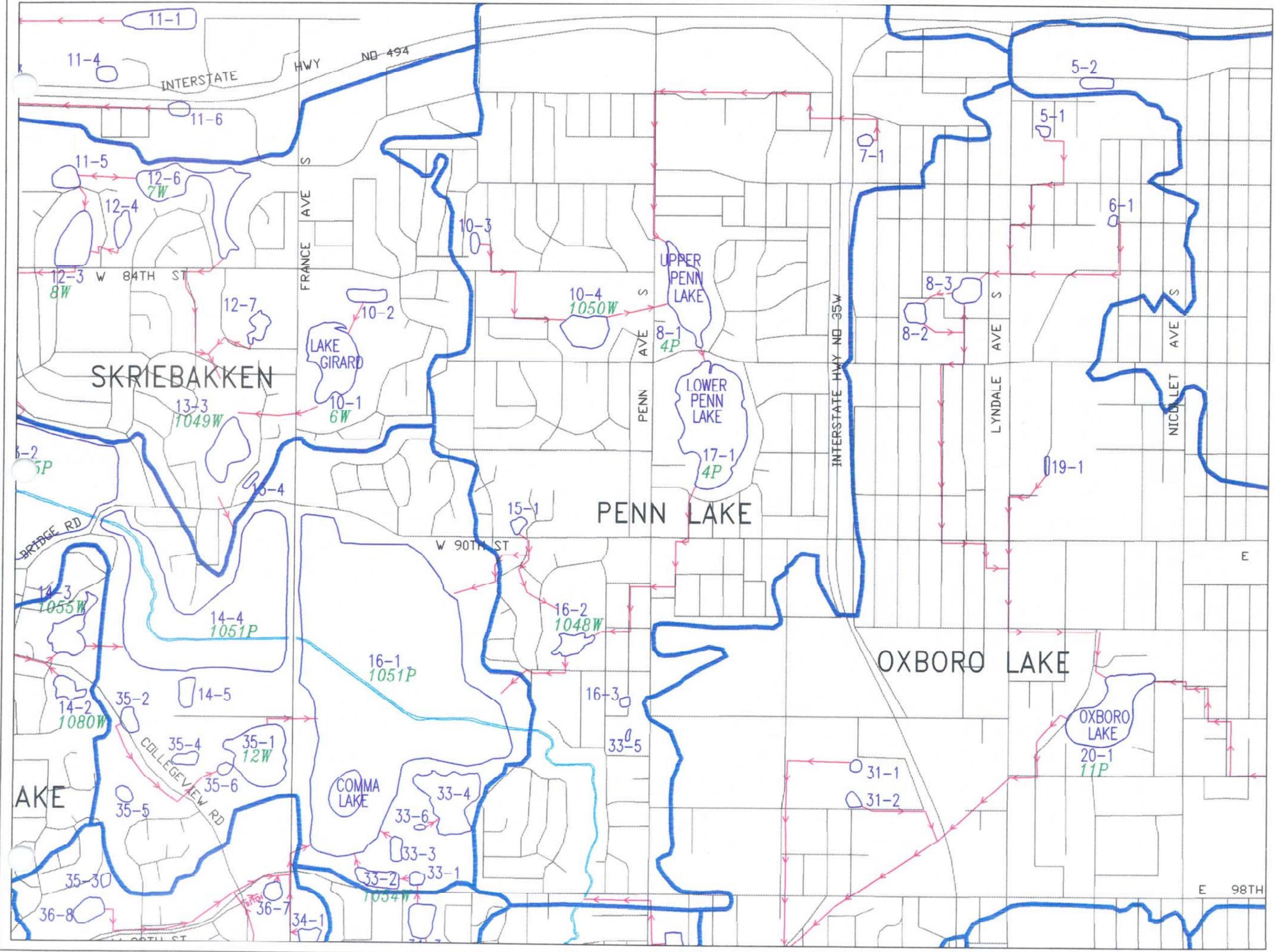
Purple loosestrife monitoring is recommended for Adelman Pond (10-04). Refer to Section 4.47 and Table 4.47a for control measures.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Sedimentation Basin	Barthel's Pond (16-02)
Repair Sedimentation Basins	Lower Penn Lake (17-01)



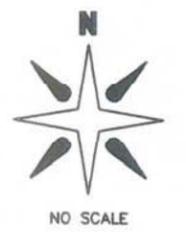
MAP 3.22

DRAINAGE AREA: PENN LAKE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



city of bloomington, minnesota
PUBLIC WORKS DEPARTMENT

3.23 Riley-Purgatory Creek Drainage Area

Watershed Description

The Riley-Purgatory Creek Drainage Area is located on the southwest border of Bloomington; west of West Bush Lake Road and south of Amsden Road. It drains 1146 acres in Bloomington and 340 acres from Eden Prairie. Before the outlet to Purgatory Creek at Eden Prairie's Riverview Road was installed in 1980, the entire drainage basin was landlocked. Roughly 60 percent of the drainage area contains single family homes and retail businesses. Public land, including the Highway 169 right-of-way, and conservation land make up the remaining 40 percent of the drainage area.

Drainage Area	1486 acres
Primary Land Use	Residential/Public
Percent Impervious	33%
Number of Natural Wetlands	19
Number of Manmade Ponds	2
Wetlands with Storm Sewer	18
Watershed District	Riley-Purgatory-Bluff Creek
Receiving Water Body	Purgatory Creek

Wetland Quality

Overall wetland quality for the Riley-Purgatory Creek Drainage Area is rated as highly impacted to moderate. Seven wetlands are rated as highly impacted in wetland quality due to low to moderate floral diversity value ratings, a history of chemical treatment, disturbance during the construction of Highway 169, and mowing of the upland buffer zone. Eleven wetlands are rated as moderate in wetland quality due to moderate to high floral diversity and wildlife habitat value ratings, moderate human disturbance, infestation of invasive exotic species, and mowing of the upland buffer zone. Warren Conservation Area (70-03), the only wetland rated as excellent in wetland quality, is rated high in floral diversity and wildlife habitat value ratings, low human disturbance, and natural upland buffer zone. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Riley-Purgatory Creek Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	9
B	Policy Changes & Public Education	10
C	Preserve	2

A number of recommended actions are common to wetlands found in all three action categories. Recommendations include target and/or general education, review of City park maintenance practices, purple loosestrife control and monitoring, and routine maintenance. Target educational programs focus on mowing and chemical treatment. See Appendix A for specific recommendations.

Purple loosestrife control is recommended for four of the wetlands. Refer to Section 4.47 and Table 4.47a for control measures.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Trap Manhole (s)	Amsden Ridge Pond (62-01) Marce Woods Pond, N (62-02) Marce Woods Pond, S (62-03) Woodbridge Marsh (69-01) Duck Pond, S (69-03) Lindstrom Pond (69-08) Warren Conservation (70-03) Utah Pond 2 (70-05)
Forebay	Duck Pond, S (69-03)
Re-route storm sewer	Warren Conservation (70-03)
Redesign Inlet/Outlet	Sunrise Pond, NS (69-02)



3.24 Skriebakken Drainage Area

Watershed Description

The Skriebakken Drainage Area is located in north-central Bloomington; south of I-494, east of Normandale Boulevard, north of West 98th Street, and west of Xerxes Avenue. It drains approximately 853 acres. The two main storm water storage basins, Pauly's Pond and Skriebakken Pond, both flow into Nine Mile Creek. Roughly 80 percent of the drainage area is residential; primarily single family homes. The remaining 20 percent is comprised of wetlands and commercial area.

Drainage Area	853 acres
Primary Land Use	Residential
Percent Impervious	55%
Number of Natural Wetlands	9
Number of Manmade Ponds	0
Wetlands with Storm Sewer	8
Watershed District	Nine Mile Creek
Receiving Water Body	Nine Mile Creek

Wetland Quality

Overall wetland quality for the Skriebakken Drainage Area is rated as highly impacted to moderate. Three wetlands are rated as highly impacted in wetland quality due to low to moderate floral diversity value ratings, extensive mowing of the upland buffer zone, a history of chemical treatment, high utilization as flood and storm water detention basins, and significant human disturbance. Seven wetlands are rated as moderate in wetland quality due to moderate to high floral diversity and wildlife habitat value ratings, infestation of invasive and exotic species, storm water detention basins, mowing of the upland buffer zone, and moderate human disturbance. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Skriebakken Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	4
B	Policy Changes & Public Education	5
C	Preserve	0

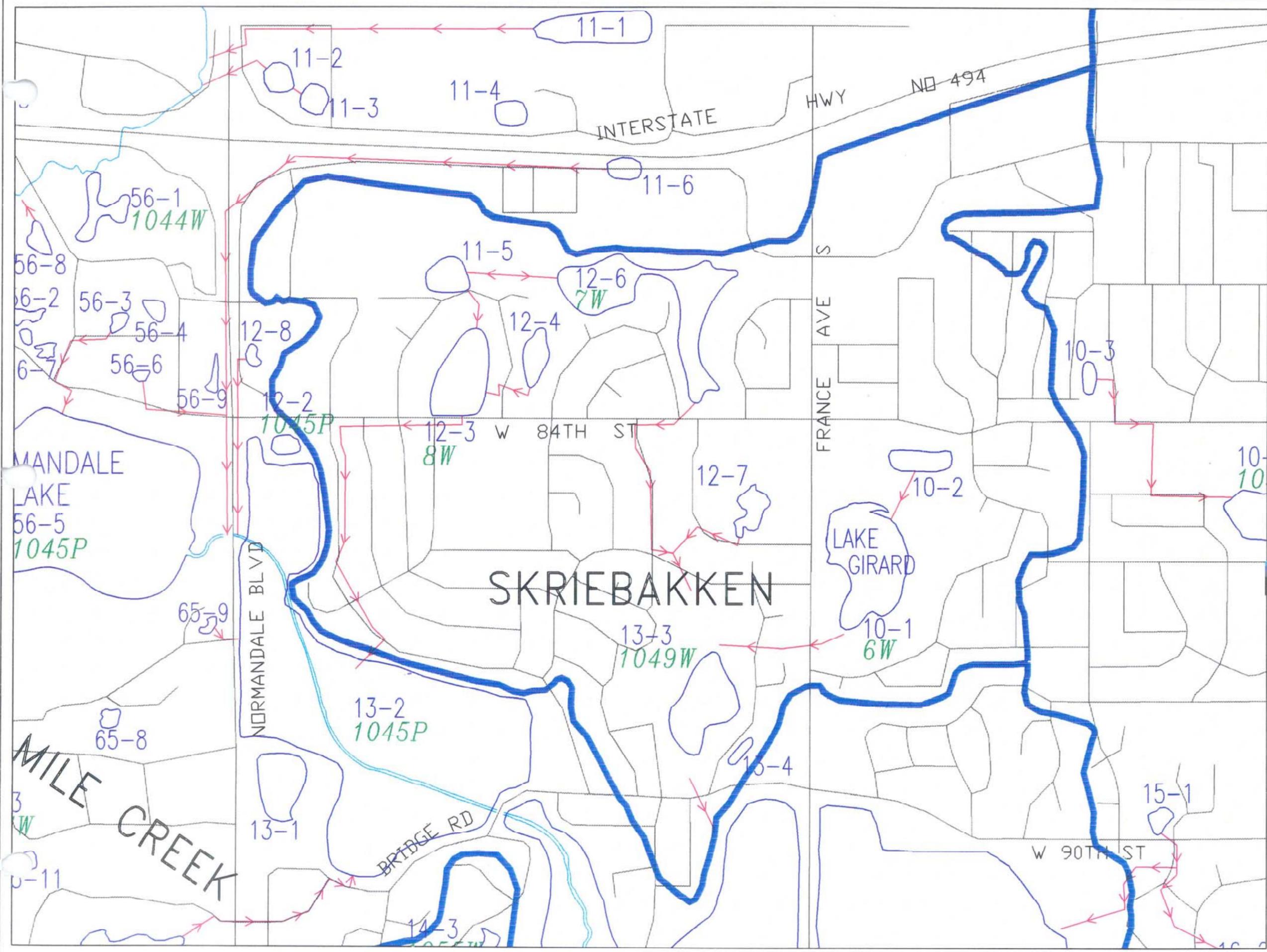
A number of recommended actions are common to wetlands found in both action categories. Recommendations include target and/or general education, review of City park maintenance programs; and purple loosestrife control. Education programs focus on buffers and wetland mowing; fertilizer and pesticide use, chemical treatment; and yard maintenance practices. See Appendix A for specific recommendations.

Due to an uncontrollable amount of purple loosestrife, Girard Lake (10-01) and Girard Pond (10-02) are recommended for purple loosestrife monitoring. If an acceptable means of control is developed, it is recommended that it be used. Control of purple loosestrife is recommended for Wanda Miller Pond (12-06). Refer to Section 4.47 and Table 4.47a for control measures.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Sedimentation Basin (s)	Girard Lake (10-01) Girard Pond (10-02) Skriebakken Pond, E (13-03)
Forebay	Wanda Miller Pond (12-06)



DRAINAGE AREA:
SKRIEBAKKEN



LEGEND

- 27-1 Wetland ID #'s
 - 1078B DNR Protected Water #'s
 - Storm Sewer
 - - - Overland Flow
 - Drainage Area Boundary
 - Wetland Boundaries *
 - Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.25 Smith Pond - Wright's Lake Drainage Area

Watershed Description

The Smith Pond -Wright's Lake Drainage Area is located in northeast Bloomington; east of Nicollet Avenue, west of Cedar Avenue, south of I-494, and north of 94th Street. It drains approximately 2265 acres, including 580 acres from the City of Richfield. Only two basins are located in the drainage area, Smith Pond and Wright's Lake. All drainage from the area is conveyed to Pond C, (which was built by the Minnesota Department of Transportation during the 1990 Trunk Highway 77 construction), through Long Meadow Lake and to the Minnesota River. Roughly 75 percent of the drainage area is residential, single and multiple family homes. The remaining 25 percent is comprised of churches, schools, and industrial.

Drainage Area	2265 acres*
Primary Land Use	Residential
Percent Impervious	44%
Number of Natural Wetlands	2
Number of Manmade Ponds	0
Wetlands with Storm Sewer	2
Watershed District	Richfield - Bloomington WMO
Receiving Water Bodies	Pond C/Long Meadow Lake/ Minnesota River

*The majority of the Richfield flow is diverted to the I-494 storm sewer system.

Wetland Quality

Overall wetland quality for the Smith Pond and Wright's Lake Drainage Area is rated as highly impacted. Both wetlands are rated as highly impacted in wetland quality due to low to moderate floral diversity value ratings, extensive mowing of the upland buffer zone, mowing of the wetland, a history of chemical treatment, and high utilization as flood and storm water detention basins. Refer to Appendix A for field inventory data summary sheets for each wetland.



Summary of Recommendations
(Smith Pond - Wright's Lake Drainage Area)

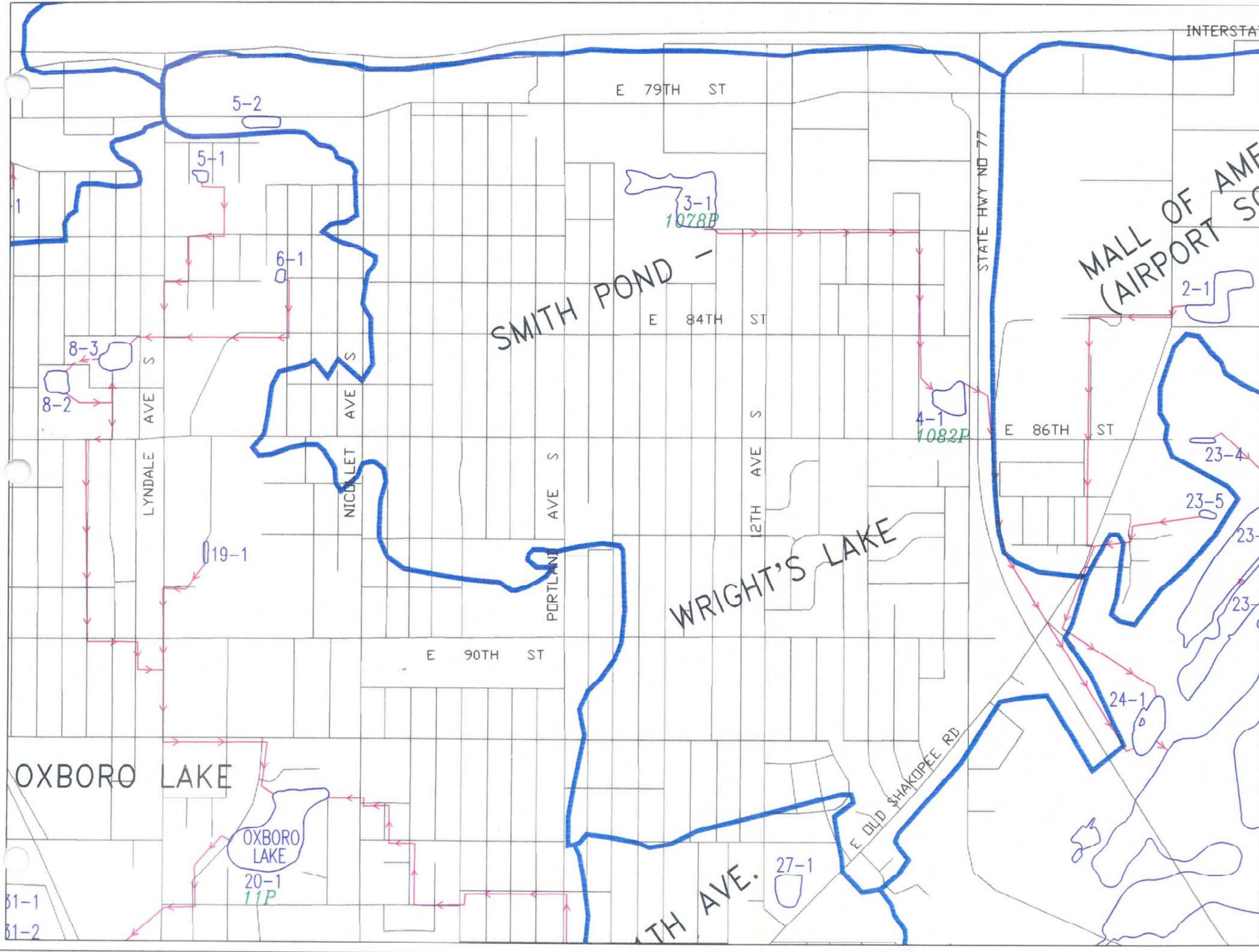
Action Category		Number of Wetlands
A	Capital Improvements	2
B	Policy Changes & Public Education	0
C	Preserve	0

General education is recommended for Smith Pond (03-01) and review of City park maintenance practices is recommended for Wright's Lake (04-01). See Appendix A for specific recommendations.

Recommended Capital Improvement(s)	Name(s)/Index Number(s)
Forebay or Sedimentation Basins Review for regional water quality design	Smith Pond (03-01)
Trap Manhole/Forebay Repair outlet structure	Wright's Lake (04-01)



DRAINAGE AREA:
SMITH POND
- WRIGHT'S LAKE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.26 South Glen Drainage Area

Watershed Description

The South Glen Drainage Area is located in south-central Bloomington; west of France Avenue, south of 98th Street, north of 102nd Street, and east of Normandale Blvd. It drains approximately 722 acres. South Glen, the primary storm water storage basin, contains a lift station which outlets to Overlook Lake in the Overlook Lake Drainage Area, then flowing to the Minnesota River. Roughly 65 percent of the drainage area is residential, including single and multiple family homes. City parks, schools, retail/commercial businesses, and wetlands comprise the remaining 35 percent.

Drainage Area	722 acres
Primary Land Use	Residential
Percent Impervious	36%
Number of Natural Wetlands	17
Number of Manmade Ponds	0
Wetlands with Storm Sewer	14
Watershed District	Nine Mile Creek
Receiving Water Body	Minnesota River

Wetland Quality

Overall wetland quality for the South Glen Drainage Area is rated as highly impacted to moderate. Five wetlands are rated as highly impacted in wetland quality due to low floral diversity value ratings, extensive mowing of the upland buffer zone, mowing of the wetland, significant human disturbance, and high utilization as flood and storm water detention basins. Ten wetlands are rated as moderate in wetland quality due to predominantly moderate floral diversity and wildlife habitat value ratings, high utilization as flood and storm water detention basins, and mowing of the upland buffer zone. Most wetlands rated as moderate are located within residential neighborhoods. Two wetlands, Ancel Glen Pond (37-04) and Heritage Hills Pond, Middle (37-06), are rated as excellent in wetland quality due to high floral diversity and wildlife habitat value ratings, and they have natural upland buffer zones. Refer to Appendix A for field inventory data summary sheets for each wetland.



Summary of Recommendations
(South Glen Drainage Area)

Action Category		Number of Wetlands
A	Capital Improvements	2
B	Policy Changes & Public Education	12
C	Preserve	3

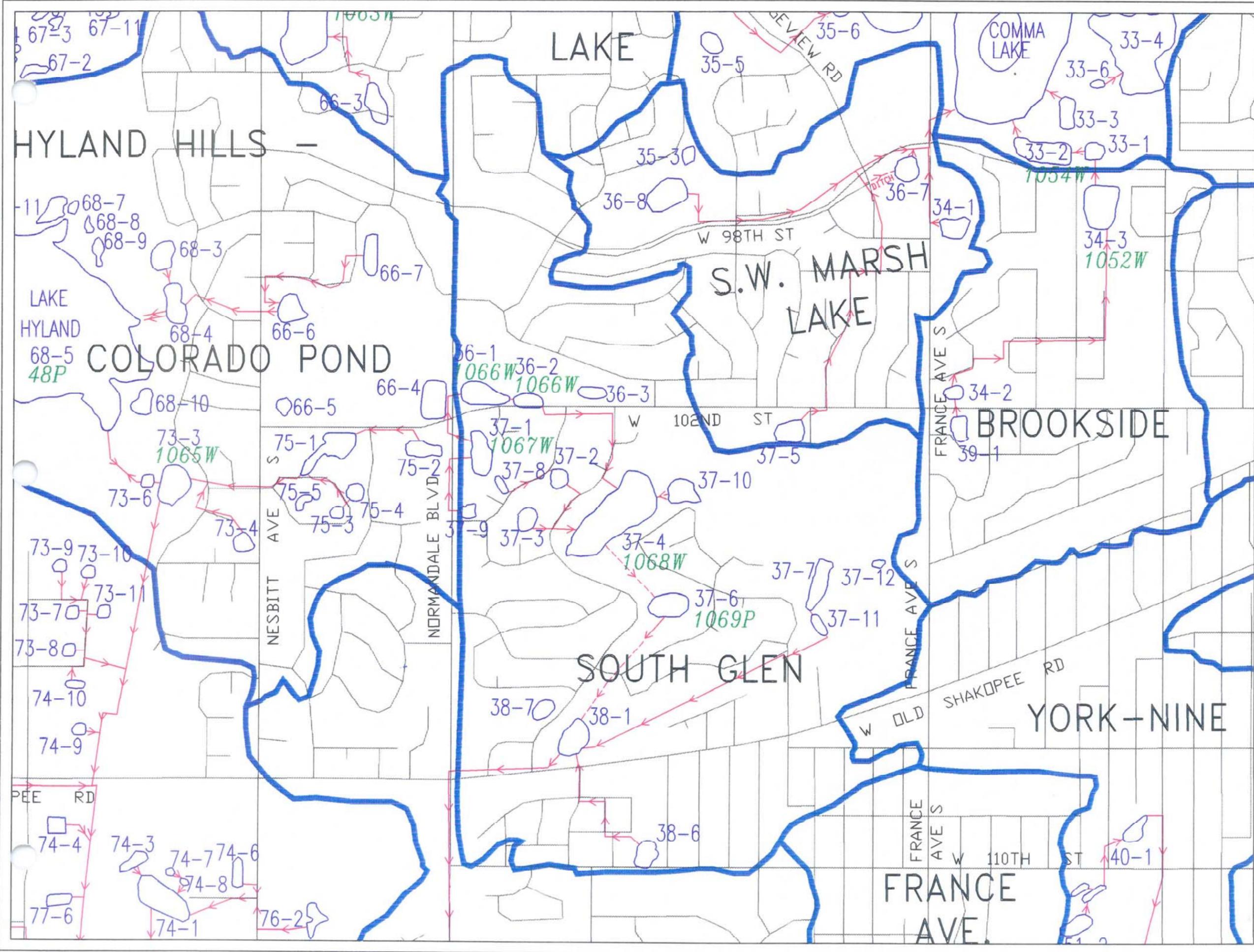
A number of recommended actions are common to wetlands found in all three action categories. Recommendations include target and/or general education. Education programs focus on buffer and wetland mowing, chemical treatment, and erosion control measures. Four private ponds, Tarnhill Pond West (36-01), Scarborough Northwest (37-02), Heritage Hills Pond East (37-07), and Heritage Hills Pond Northeast (37-11), are recommended for the installation of trap manholes by property owners. See Appendix A for specific recommendations.

Recommended Capital Improvement (s)	Name(s)/Index Number(s)
Trap Manhole (s)	Scarborough, NW (37-01) Ancel Glen Pond (37-04)
Forebay	Ancel Glen Pond (37-04)



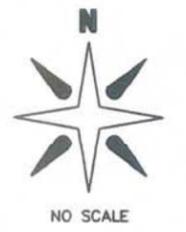
MAP 3.26

DRAINAGE AREA:
SOUTH GLEN



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary.
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.27 South West Marsh Lake Drainage Area

Watershed Description

The Southwest Marsh Lake Drainage Area is located in central Bloomington; east of France Avenue, south of 97th Street, and north of 102nd Street. It drains approximately 317 acres. Four of the five basins in the drainage area flow directly to East Marsh Lake and eventually into Nine Mile Creek. Roughly 80 percent of the area is single and multiple family homes and Normandale Community College. The remaining 20 percent is park and wetland.

Drainage Area	317 acres
Primary Land Use	Residential
Percent Impervious	33%
Number of Natural Wetlands	5
Number of Manmade Ponds	0
Wetlands with Storm Sewer	4
Watershed District	Nine Mile Creek
Receiving Water Bodies	East Marsh Lake/ Nine Mile Creek

Wetland Quality

Overall wetland quality for the South West Marsh Lake Drainage Area is rated as moderate. All five wetlands in the drainage area are rated as moderate in wetland quality due to moderate floral diversity and wildlife habitat value ratings, natural upland buffer zones, existence of invasive exotic species, and moderate human disturbance. Refer to Appendix A for field inventory data summary sheets for each wetland.



Summary of Recommendations
(South West Marsh Lake Drainage Area)

Action Category		Number of Wetlands
A	Capital Improvements	1
B	Policy Changes & Public Education	4
C	Preserve	0

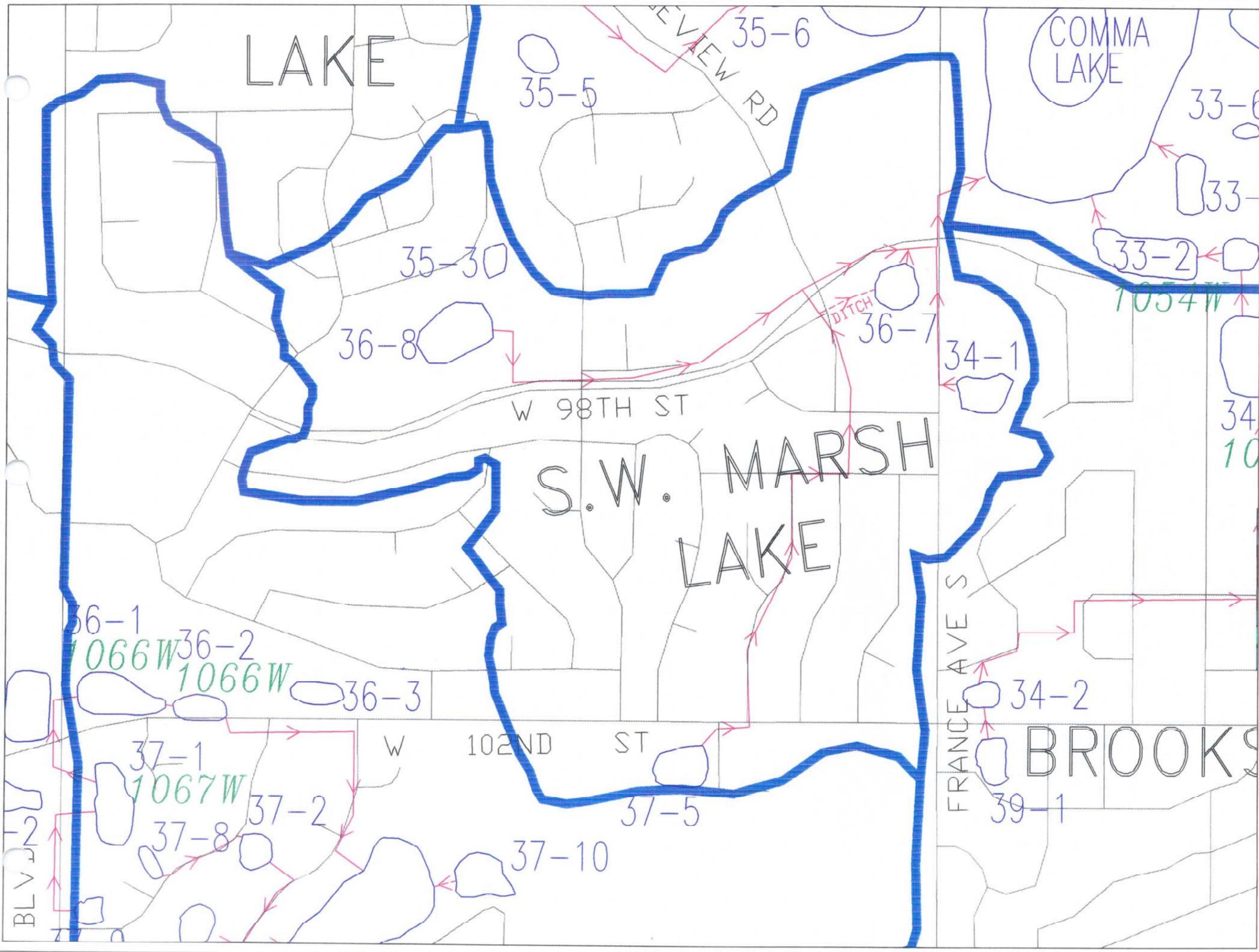
All five basins are recommended for target and/or general education. See Appendix A for specific recommendations.

Recommended Capital Improvement (s)	Name(s)/Index Number(s)
Trap Manhole/Forebay	Tarnhill Park Pond (36-08)



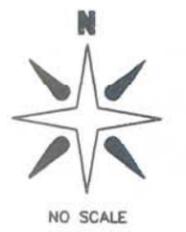
MAP 3.27

DRAINAGE AREA:
SOUTH WEST
MARSH LAKE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.28 Upper Nine Mile Creek Drainage Area

Watershed Description

The Upper Nine Mile Creek Drainage Area is located from the northwest corner to north-central Bloomington. Irregularly shaped, the drainage area is south of I-494 and follows the Nine Mile Creek corridor to West Old Shakopee Road. As the City's largest drainage area, it drains approximately 3108 acres. With the exception of Anderson Lake (which outlets to Nine Mile Creek via a 15-inch diameter storm sewer, but can also overflow into Bush Lake,) all the main storm water storage basins, including Normandale Lake, Lola Lake, West Marsh Lake, and South West Marsh Lake, are a part of the Nine Mile Creek flood plain. Roughly 50 percent of the drainage area is classified as conservation area, wetland, or park land. The remaining 50 percent is primarily residential, including multiple and single family homes, and commercial, primarily office/warehouse space.

Drainage Area	3108 acres
Primary Land Use	Commercial/Residential
Percent Impervious	26%
Number of Natural Wetlands	63
Number of Manmade Ponds	15
Wetlands with Storm Sewer	46
Watershed District	Nine Mile Creek
Receiving Water Body	Nine Mile Creek

Wetland Quality

Overall wetland quality for the Upper Nine Mile Creek Drainage Area is rated as moderate. Twelve wetlands are rated as highly impacted in wetland quality due to low floral diversity value ratings, moderate wildlife habitat value ratings, high utilization as flood and storm water detention basins, extensive mowing of the upland buffer zone, and significant human disturbance and altering of the wetland. Thirty-seven wetlands are rated as moderate in wetland quality. Moderately rated wetlands share several general characteristics including: predominantly moderate floral diversity and wildlife habitat value ratings, a moderate degree of human disturbance, natural upland buffer zones, invasive exotic species, and high utilization as flood and storm water detention basins. Thirteen wetlands are rated as excellent in wetland quality due to moderate to excellent floral diversity and wildlife habitat value ratings, and natural upland buffer zones. These are mainly diverse wetland complexes. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(Upper Nine Mile Creek Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	13
B	Policy Changes & Public Education	44
C	Preserve	12
H	Hyland Park Preserve	8

A number of recommended actions are common to wetlands found in all three action categories. Recommendations include target and/or general education, purple loosestrife control/monitoring, interpretative signing, monotypic species reduction, trash removal, and buckthorn control. Target education programs focus on mowing, buffer strips, erosion, and chemical treatment. See Appendix A for specific recommendations.

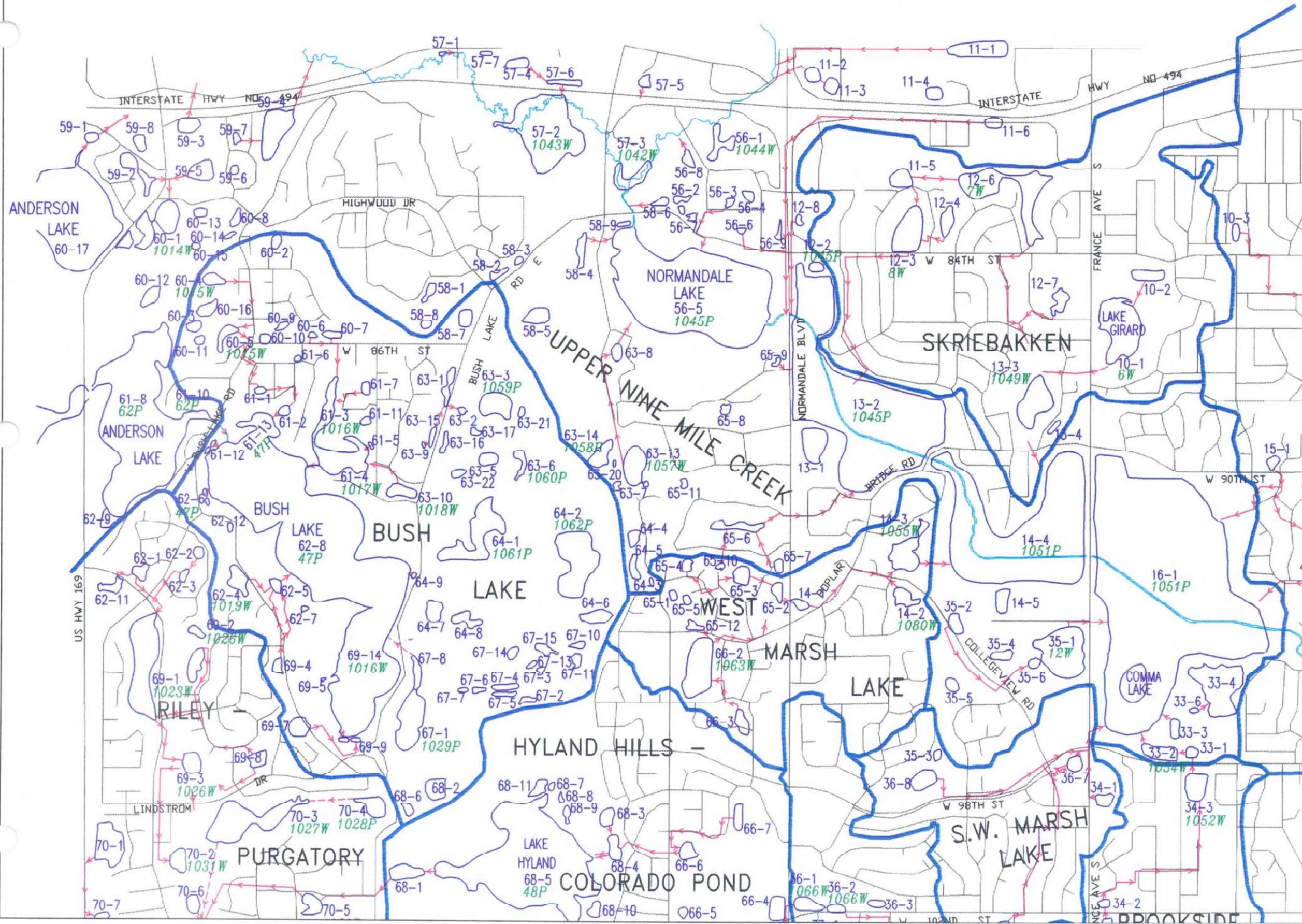
Eleven wetlands are recommended for purple loosestrife control. Six wetlands are recommended for purple loosestrife monitoring. Four wetlands are recommended for buckthorn control. Refer to Section 4.47 and Tables 4.47a and 4.47b for control measures.

Recommended Capital Improvement (s)	Name(s)/Index Number(s)
Repair Outlet Structure	Rauenhorst Pond (11-01)
Trap Manhole (s)	Normandale & 82nd Pond (12-08) Nord Myr (13-02) Marsh Lake, W (14-04) Marsh Lake, E (16-01) Normandale Lake (56-05) Kingslee Pond South (58-02) Tierneys Wood Pond, E (59-04) Dewitt Pond (60-02) Anderson Lake, SE (61-08) Bernardi's Pond (63-08) Hutton Pond (63-13)
Skimmer Structure to Outlet	Leshum Pond (57-06)
Trap Manhole/Sediment Basin	Tierneys Wood Pond, E (59-04)

Wetland in the Hyland Park Preserve (**H**) are managed by Hennepin County Parks. Hennepin County Parks will prepare a management plan for these wetlands.



DRAINAGE AREA:
UPPER NINE
MILE CREEK



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



NO SCALE

3.29 West Marsh Lake Drainage Area

Watershed Description

The West Marsh Lake is located in west-central Bloomington; south of 92nd Avenue and north of 97th Avenue. It drains approximately 400 acres. Kingsdale Pond, the primary storm water storage basin, outlets to West Marsh Lake and eventually into Nine Mile Creek. Roughly 70 percent of the drainage area is residential; primarily single family homes. The remaining 30 percent is made of parks, wetlands, small commercial businesses, and churches/schools.

Drainage Area	400 acres
Primary Land Use	Residential
Percent Impervious	33%
Number of Natural Wetlands	11
Number of Manmade Ponds	1
Wetlands with Storm Sewer	10
Watershed District	Nine Mile Creek
Receiving Water Body	Nine Mile Creek

Wetland Quality

Overall wetland quality for the West Marsh Lake Drainage Area is rated as highly impacted to moderate. Four wetlands are rated as highly impacted in wetland quality due to low floral diversity value ratings, high utilization as flood and storm water detention basins, extensive mowing of the upland buffer zone, and significant human disturbance. Six wetlands are rated as moderate in wetland quality due to moderate to high floral diversity and wildlife habitat value ratings, mowing of the upland buffer zone, infestation of invasive exotic species, moderate to high utilization as flood and storm water detention basins, and a history of chemical treatment. Kingsdale Pond is the only wetland rated as excellent in wetland quality due to its high floral diversity and wildlife habitat value ratings, natural upland buffer zone, diverse aquatic habitat, and low human disturbance. Refer to Appendix A for field inventory data summary sheets for each wetland.



Summary of Recommendations
(West Marsh Lake Drainage Area)

Action Category		Number of Wetlands
A	Capital Improvements	4
B	Policy Changes & Public Education	8
C	Preserve	0

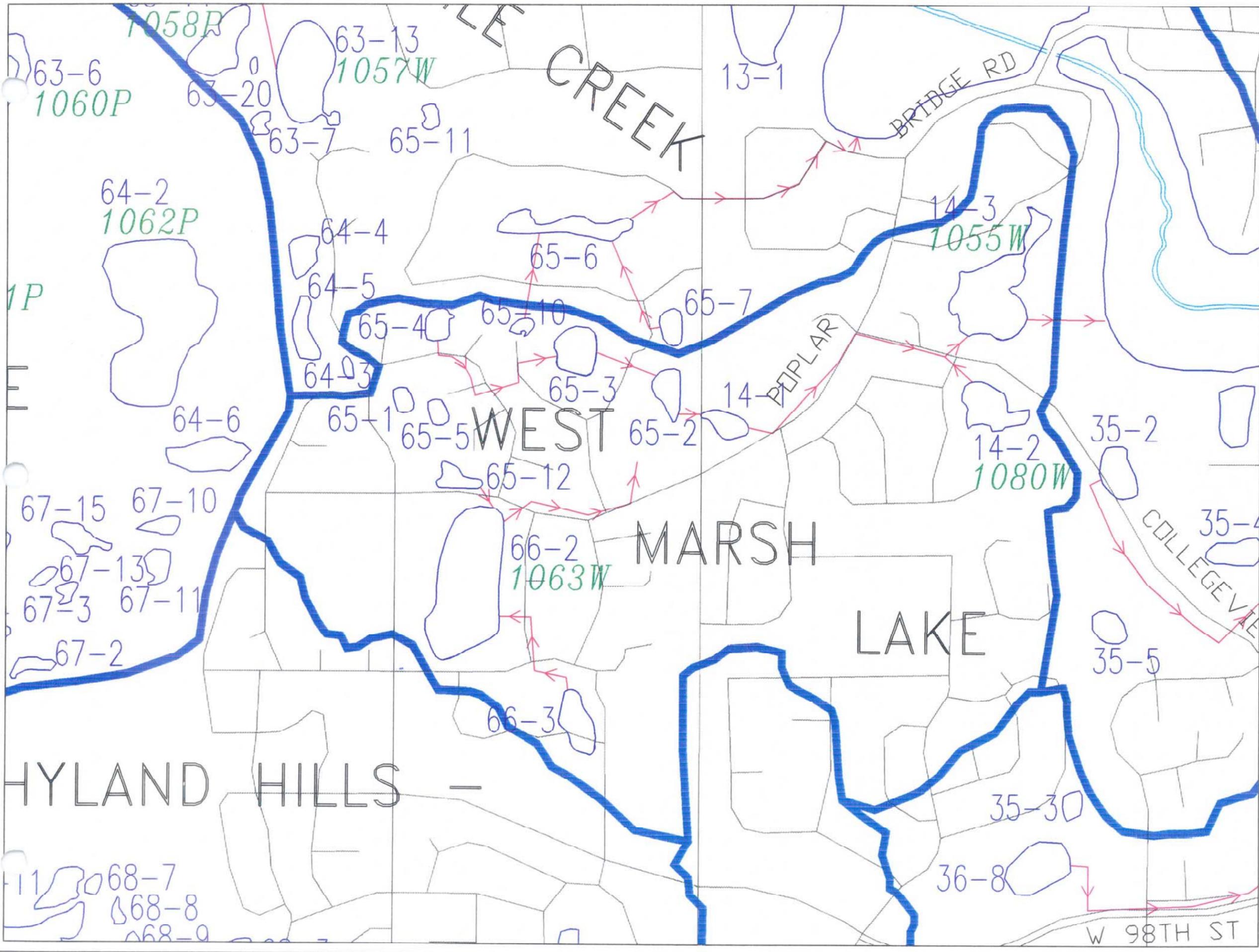
Target and/or general education are recommended for all twelve wetlands. Target education programs focus on upland and wetland buffer mowing practices, fertilizer and pesticide use, and chemical treatment. See Appendix A for specifics recommendations.

Recommended Capital Improvement (s)	Name(s)/Index Number(s)
Forebay	Water Plant Pond (14-01)
Trap Manhole (s)	Water Plant Pond (14-01) Kingsdale Pond (14-03) Green Briar 2nd Pond (65-03) St. Edwards Pond (66-02)



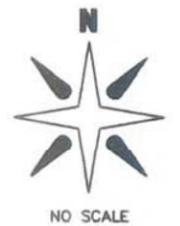
MAP 3.29

DRAINAGE AREA:
WEST MARSH
LAKE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



3.30 York-Nine Drainage Area

Watershed Description

The York-Nine Drainage Area is located in south-central Bloomington; north of Overlook Drive, south of West Old Shakopee Road, west of Thomas Avenue, east of Beard Avenue. It drains approximately 413 acres. The three basins in the drainage area all drain into the Minnesota River. Roughly 80 percent of the drainage area is residential; primarily single family homes. City parks and wetlands comprise the remaining 20 percent.

Drainage Area	413 acres
Primary Land Use	Residential
Percent Impervious	25%
Number of Natural Wetlands	1
Number of Manmade Ponds	2
Wetlands with Storm Sewer	3
Watershed District	Nine Mile Creek
Receiving Water Body	Minnesota River

Wetland Quality

Overall wetland quality for the York-Nine Drainage Area is rated as highly impacted. Xerxes Pond, the only natural wetland in the drainage area, is rated as highly impacted in wetland quality due to a low floral diversity value rating, extensive mowing of the upland buffer zone, mowing of the wetland, and significant human disturbance. Refer to Appendix A for field inventory data summary sheets for each wetland.



**Summary of Recommendations
(York-Nine Drainage Area)**

Action Category		Number of Wetlands
A	Capital Improvements	1
B	Policy Changes & Public Education	2
C	Preserve	0

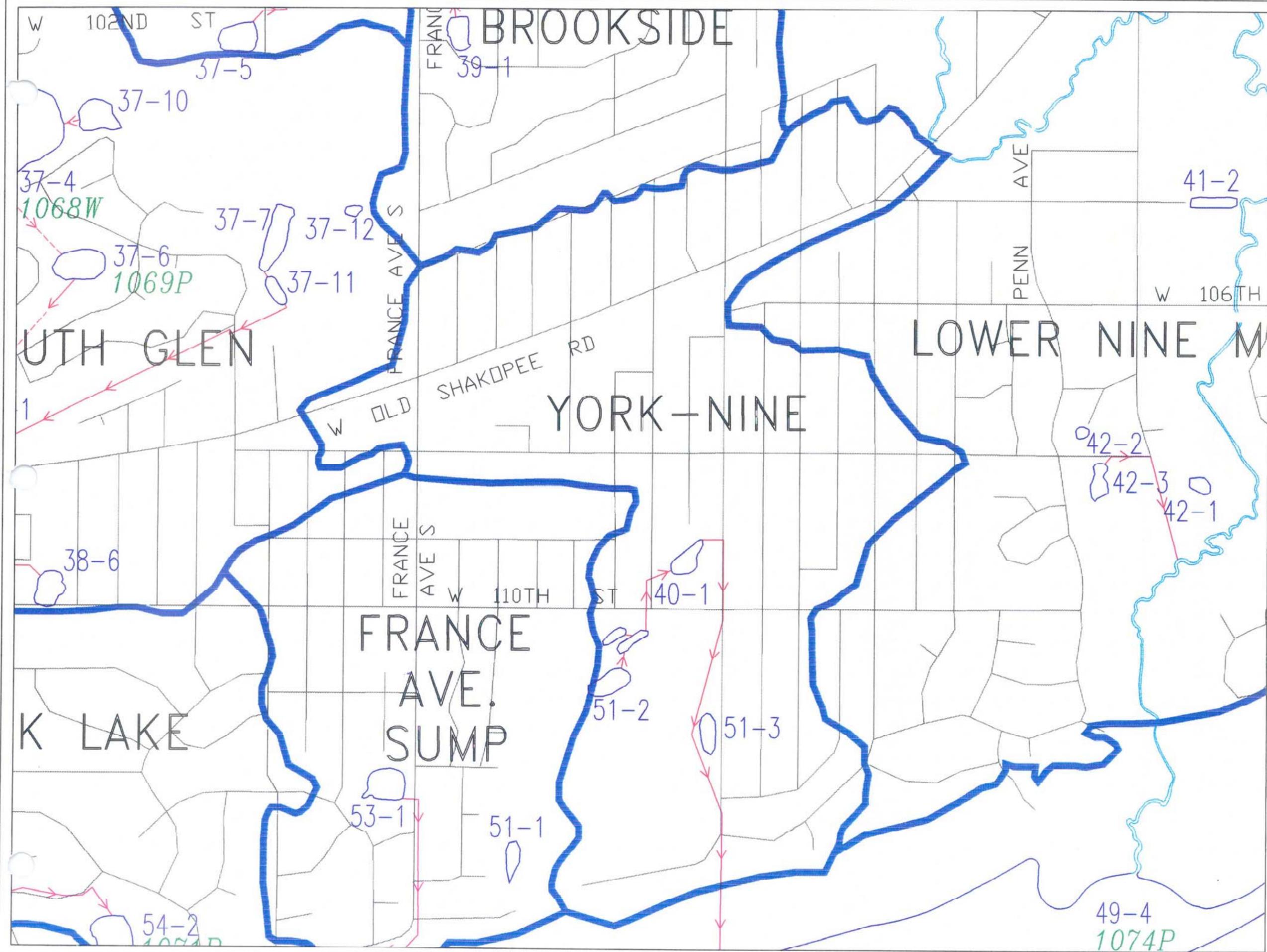
Target and/or general education are recommended for all three basins. Target education focuses on mowing practices. See Appendix A for specific recommendations.

Recommended Capital Improvement (s)	Name(s)/Index Number(s)
Trap Manhole (s)	Xerxes Pond (40-01)



MAP 3.30

DRAINAGE AREA:
YORK-NINE



LEGEND

- 27-1 Wetland ID #'s
- 1078B DNR Protected Water #'s
- Storm Sewer
- - - Overland Flow
- Drainage Area Boundary
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



4.0 Existing and Proposed Policies, Ordinances and Programs

4.10 Summary

This section of the plan presents a summary of the existing and proposed City policies, ordinances, and programs that deal with wetland issues. It explains how the policies, ordinances, and programs address the problems identified in the needs assessment. Where revisions or additions to existing policies, ordinances, and programs are needed to adequately meet the needs, recommendations are provided. In cases where a new policy, ordinance, or program is proposed, a rationale for adoption and the recommended content is provided. Copies of the existing policies, ordinances and programs can be found in Appendices E, F and G, respectively.

4.20 Policies

4.21 Summary

The policies presented herein are proposed to be Council approved, written policies that would serve as guidance for future administrative and Council decisions in these areas. Three policies are presented in this section. The vegetative buffer zone policy is new. The wetland modification assessment policy and the aquatic plant chemical treatment policy are existing policies for which changes are recommended.

4.22 Vegetative Buffer Zone Policy

Introduction

One of the steps the City can take to improve the quality of its wetlands is providing a vegetative buffer zone around its wetlands. A vegetative buffer zone is a natural area of vegetation in the upland area adjacent to a water body wetland or a watercourse wetland. Vegetative buffer zones enhance water quality and fish and wildlife habitat.

Discussion

Much of the privately held land in Bloomington that surrounds wetlands is maintained as manicured lawn. In some areas, the lawn is maintained to the edge of the wetland or water course. These conditions have existed for many years. Many citizens purchased their homes with this as the existing condition; one that they value.

Most of the water body wetlands and watercourse wetlands located on public land have some vegetative buffer. There are many areas where the buffers do not meet the minimum widths recommended in the new state guidelines. This is due to a number of factors. In some areas, the public land is not wide enough and the adjacent private land is maintained as a lawn. In some park areas the buffer area is mowed. A few areas of public land adjacent to wetlands are maintained as lawn by the adjacent private property owners.



Vegetative buffer zones provide numerous benefits. Lawn care chemicals cannot be applied immediately adjacent to a wetland that has a vegetative buffer zone. If a buffer exists between a wetland and a manicured lawn, it will filter suspended solids, and provide uptake of nutrients and harmful or toxic substances that are carried by surface water runoff. Besides the benefits of nutrient uptake and filtering herbicides applied to lawns, buffers help minimize other human impacts; such as nutrient leaching from shoreline compost piles, illegal dumping of hazardous materials and erosion from open slopes.

Buffers can provide shade to reduce the temperature of both the storm water runoff and the wetland. Water temperature is one of the factors controlling the ability of water to hold dissolved oxygen. This ability decreases with increasing water temperature. The dissolved oxygen level must be maintained at a minimum level to maintain healthy aquatic life.

Buffers provide visual screens, food sources and brooding areas for numerous wildlife species. In some areas, the wetlands are part of a continuous corridor that permits wildlife to move freely. The wetlands protected by buffers offer areas of rest and food for migratory birds and waterfowl. Buffers also provide goose control. Geese are much less likely to feed on lawn areas if there is a natural vegetative buffer between the wetland and the turf.

An ad hoc group consisting of representatives from federal, state and local government recently prepared recommendations for vegetative buffer widths around wetlands, lakes and streams. The recommendations are based on the value of the wetlands (defined by five wetland classes). The wetland classes and the recommended vegetative buffer widths for each are defined in the following tables.



Table 4.22a

Recommended Wetland Buffer Width Classes*	
Class 1	Wetlands assigned the unique/outstanding rating in the inventory of wetlands conducted by the city. Class 1 wetlands are those with conditions and functions most highly susceptible to human impacts, are most unique, have the highest community resource significance such as rare species habitats, and similar characteristics.
Class 2	High value wetlands that are relatively undisturbed, with conditions and functions that are susceptible to human impacts, are connected to other wetlands or waterways, and may contain locally significant or rare wetland types.
Class 3	Wetlands whose functions include wildlife habitat value, that is, provide a diversity of habitats, and are connected to other wetland or upland habitats to provide wildlife habitat
Class 4	Moderate value wetlands that are less susceptible to further impacts than Class 1 or 2, and have low diversity and connectivity to other wetlands and waterways.
Class 5	Wetlands assigned the highly impacted rating in the city's inventory. Class 5 wetlands are those with conditions and functions most impacted by human activities, with the least diverse vegetation communities, least community resource significance and similar characteristics.

* If the policy is enacted, the City's wetlands will be categorized for buffer widths using the 5 classes described in this table.

Table 4.22b

Recommended Buffer Widths for Classes					
	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3 + Lakes + Streams</u>	<u>Class 4</u>	<u>Class 5 Storm_ Water</u>
Average buffer width	100 feet	100 feet	50 feet	25 feet	0 feet
Minimum buffer width	100 feet	50 feet	25 feet	20 feet	0 feet



Recommendations

It is recommended that a vegetative buffer zone policy be enacted. The policy would use the buffer widths presented in the state guidance. Three specific situations would be addressed.

1. New development of land in its natural state would have to meet the buffer width criteria.
2. The City would (a) modify its maintenance practices to increase buffer widths to meet the buffer width criteria and (b) take action to end the maintenance of public land areas adjacent to wetlands as lawns by adjacent private land owners.
3. Private land owners would be encouraged to convert maintained lawn areas next to wetlands to natural vegetative buffer zones. The education program could be used as a vehicle to distribute information on the importance of buffers and provide tips on how to conduct a successful conversion.

4.23 Wetland Modification Assessment Policy

Introduction

This policy is recommended as a revision to what is currently called the Pond Restoration Assessment Policy. The policy was developed to provide a basis for cost sharing, (between the City and private landowners) for construction projects that modify a wetland (pond) for aesthetic purposes.

Discussion

The policy was developed to provide a means of insuring that property owners who requested a wetland modification project for aesthetic purposes in a wetland that they lived on would pay some of the cost of the project. A cost-share schedule was created that varied based on the ownership of the wetland, the wetland's connection to the public storm sewer system and the level of public access to the wetland. The policy must be updated to better define its purpose and to match the goals of this plan.

Recommendations

A revised draft of the Wetland Modification Assessment Policy is provided in Appendix E. Besides changing the policy name, the revised policy clearly defines the reason for the policy: to assess those properties surrounding a wetland for petitioned wetland modification construction projects done to address aesthetic issues. The revised policy also states that the project must meet the goals of this plan, or be shown to be beneficial to the wetland, if the proposed work will result in a change in wetland type from that existing at the location historically.



4.24 Aquatic Plant Chemical Treatment Policy

Introduction

The Environmental Services Division of the City of Bloomington provides an algae and aquatic macrophyte control program for surface water bodies within the City. The 48 water bodies listed in Table 4.24 have been treated with either herbicide or algaecide compounds in the past. See Figure 7 for a map showing the location of wetlands that have been chemically treated to control aquatic vegetation.

Table 4.24

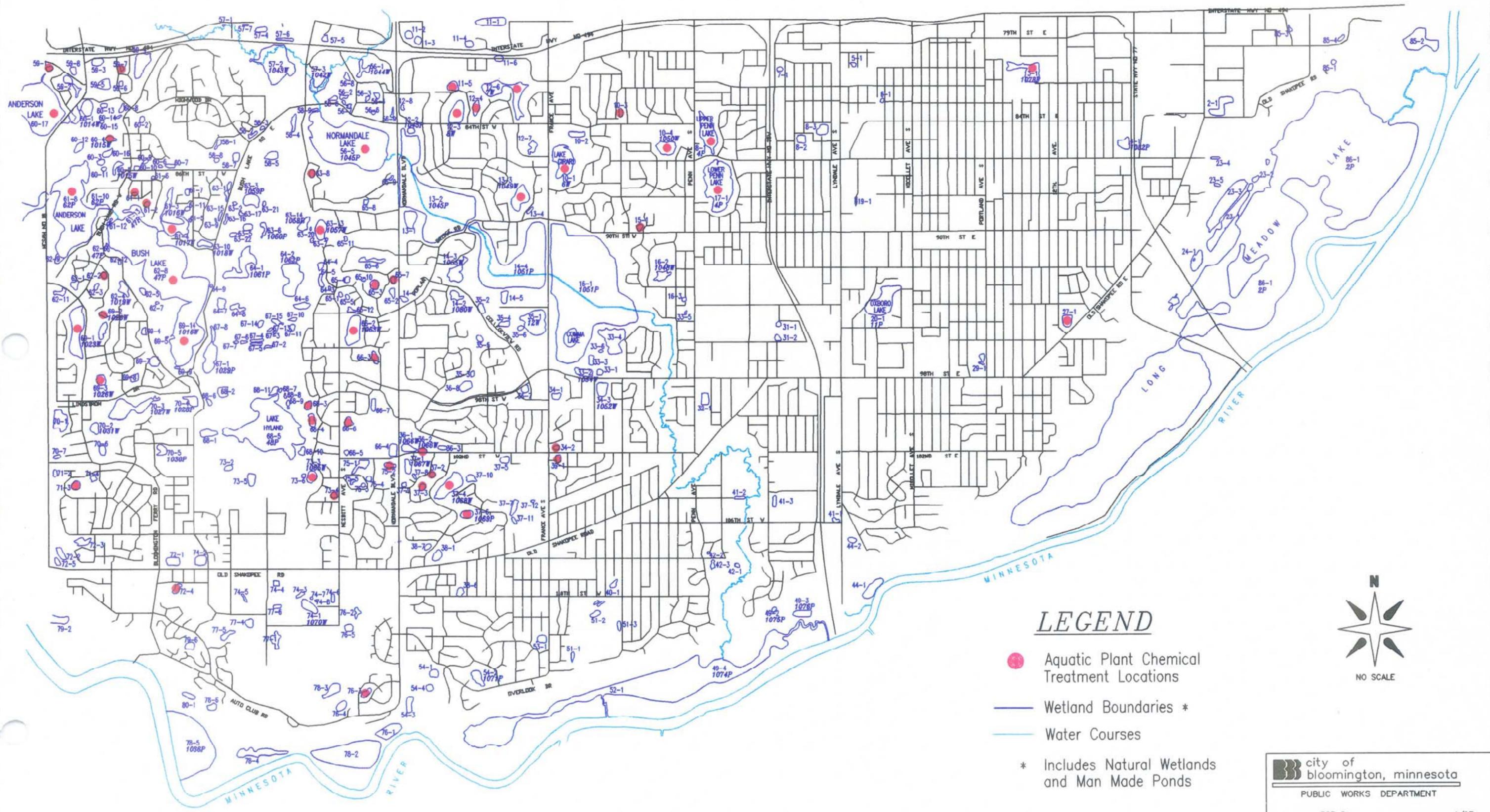
Water Bodies that the City has Chemically Treated			
03-01	Smith Pond	61-02	Utah Pond 1
08-01	Upper Penn Lake	61-04	Bush Lake, East Bay
10-01	Girard Lake	61-07	Pine Pond
10-03	Forest Crest Pond	61-08	Anderson Lake, SE
10-04	Adelmann Pond	61-17	West Anderson Lake
11-05	Victoria Pond	62-02	Marce Woods Pond, N
12-03	Pauly's Pond	62-08	Bush Lake
12-04	Oxmore Pond	63-08	Bernardi's Pond
12-06	Wanda Miller Pond	63-13	Hutton Pond
13-03	Skriebakken Pond	65-03	Green Briar 2nd Pond
15-01	Lincoln Pond	65-07	Briar Pond
17-01	Lower Penn Lake	66-02	St. Edwards Pond*
27-01	Running Pond	66-03	Hyland Court Pond
34-02	Galloway Pond	66-06	Hyland Greens Pond, NW
36-02	Tarnhill Pond, E	68-03	Hyland Hills Pond, N
37-02	Scarborough, NE	68-04	Hyland Hills Pond, S
37-03	Scarborough, S	69-01	Woodbridge Marsh
37-04	Ancel Glen Pond	69-02	Sunrise Pond, NS
37-06	Heritage Hills Pond - Middle	69-03	Duck Pond, S
37-07	Heritage Hills Pond, East	69-08	Lindstrom Pond
39-01	Canterbury Oaks Pond	69-14	Bush Lake, South Bay
56-04	Joston's Pond, East	71-03	West Park Hills Pond 2
56-05	Normandale Lake	72-04	Curry Farms Pond*
59-01	Andcor Pond*	73-03	Colorado Pond
59-07	Tierneys Woods Pond, NW	73-04	Strand Estates Pond
60-04	Park Knoll 2nd Pond	75-02	Berkshire Pond
60-05	Bogen Pond	76-03	River Bluff Pond
61-01	Pickfair Pond		

* Manmade



FIGURE 7

AQUATIC PLANT CHEMICAL
TREATMENT LOCATIONS MAP



LEGEND

-  Aquatic Plant Chemical Treatment Locations
-  Wetland Boundaries *
-  Water Courses
- * Includes Natural Wetlands and Man Made Ponds



NO SCALE

 city of
bloomington, minnesota
PUBLIC WORKS DEPARTMENT

DRAWN BY BOB O. DATE 1/97

Discussion

Aquatic treatments are done in accordance with rules and regulations promulgated by the Departments of Natural Resources and Agriculture. The persons engaged in the treatments are City employees who have passed written examinations, who have annual continuing education training credits, and who are certified by the Department of Agriculture to use the compounds that are applied to the water bodies.

These compounds are diquat and copper sulfate, which are used in the largest percentage of applications. Glyphosate salts, endothal salts, 2-4D and surfactants are used in a smaller percentage of applications.

The common types of aquatic macrophytes treated are: Eurasian watermilfoil, chara, potamogetons, bushy pondweed, coontail, curlyleaf pondweed, duckweed, water lily and purple loosestrife. In addition, (swimmers itch) parasites, filamentous and plankton algae are treated.

Yellow lotus, an aquatic macrophyte found in Bloomington, is protected. This plant may not be treated with pesticides. Bulrushes and cattails are considered desirable, they may be removed or treated only under special circumstances.

Aquatic pesticides are used on water bodies for a variety of reasons: to enhance recreational use of the water body, to control diseases affecting public health (swimmers itch), to remove undesirable exotic species, to reduce objectionable odors, and to prevent blooms of toxic algae (rhodophyta and anabaena).

The benefits of aquatic macrophytes, in terms of food, shelter, and habitat for aquatic organisms, fish, mammals, amphibians, reptiles, and waterfowl are numerous. The use of aquatic pesticides must be done in a manner that does not totally disrupt aquatic life. Therefore, treatments of entire water bodies are neither recommended nor permitted, when delicate or sensitive natural resources could be adversely impacted by the treatments.



Recommendations

Historical Environmental Records Database

Develop a database to store all chemical treatment data. Develop policies for length of time data is kept on file and security issues for the database.

Permit Requirements and City Policy for (Private) Aquatic Chemical Treatment in Bloomington Waters

Currently the State of Minnesota Pesticide Control Act allows homeowners to use chemical treatments without the regulation of local government. Citizens can get many pesticides and herbicides from mail order companies. It is recommended that a local policy be developed to protect water bodies from non-recommended treatments and to assist in maintaining historical treatment data on each water body.

In addition, a local policy is needed to establish a requirement for notification when homeowners hire private contractors for aquatic macrophyte treatments.

Studies to Test Alternative Treatment Methods

It is recommended to continue the series of water quality tests which have been initiated on a limited number of water bodies to evaluate a conversion from the use of copper sulfate for algae control to an enzyme based product called Fritz-zyme 360. Fritz-zyme 360 is a blend of live heterotrophic bacteria and enzymes specifically formulated for handling high nutrient loads for efficient pond management and ease of maintenance. Fritz-zyme 360 would be used to treat algae growth in place of copper sulfate. The Fritz-zyme study would assist in determining the proper dosage of chemicals to apply to a water body.



4.30 Ordinances

4.31 Summary

The City currently has five ordinances that apply, in some manner, to wetland management and protection. These ordinances address wetlands, weed control, erosion control, shore area regulations and flood plain zoning. The recommendations presented in this plan would revise the wetland ordinance to meet the requirements of Minnesota Rules Chapter 8420. The weed ordinance (see Appendix F) would be revised to address vegetative buffer zones.

Two new ordinances are recommended. The first is a fertilizer and pesticide management ordinance that would address the type and usage of lawn fertilizer and chemicals, and education on proper use. The second ordinance addresses the need for inspection and maintenance of storm water quality treatment ponds and trap manholes that are a part of private storm sewer systems.

4.32 Wetland Ordinance

Introduction

The City enacted its wetland ordinance in 1992. This ordinance addresses the protection and replacement of wetlands, a “no net loss” policy, as per Minnesota Statutes section 103G.221 through 103G.2373, and the Wetland Conservation Act (WCA) of 1991. The statute prohibits burning, draining, and filling of wetlands, except for certain permitted cases.

Discussion

A 1996 revision to WCA provides cities that have an approved local comprehensive wetland protection and management plan some flexibility in the WCA permit review process for projects affecting wetlands. This allows the City three areas of flexibility. First, the Minnesota Rules Chapter 8420, part 8420.0240, paragraph three, states, “If the local government unit has a comprehensive wetland protection and management plan that delineates location, size and type of all wetlands, approved by the technical evaluation panel (BWSR, HCD and the LGU), and subsequently incorporated into local ordinance, the local government unit can make determinations in place of the technical evaluation panel.”

Second, the Minnesota Rules Chapter 8420, part 8420.050, subp.2B states, “The plan may vary application of the sequencing standards in Minnesota Statutes, section 103G.222, subdivision 1, paragraph (b), for projects based on the classification and criteria set forth in the plan.” This would allow all capital improvement projects approved with this plan to proceed with no further sequencing requirements.

Third, the Minnesota Rules Chapter 8420, part 8420.0650, subp. 2C allows for a variety of replacement standards. The City will follow the replacement standards stated in Chapter 8420.



Recommendations

It is recommended that the existing wetland ordinance be amended to adopt the Local Comprehensive Wetland Protection and Management Plan prepared under the requirements of the Minnesota Rules Chapter 8420, part 8420.0650. Refer to Appendix F to view the existing wetland ordinance and the proposed revisions.

4.33 Fertilizer and Pesticide Management Ordinance

Introduction

Currently the City does not have a fertilizer and pesticide management ordinance. Improper use of residential lawn fertilizer can contribute to accelerated eutrophication of Bloomington's water bodies. Better management of lawn fertilizers and other chemicals that can enter Bloomington's storm sewer system will assist in maintaining and improving Bloomington's wetland water quality.

Discussion

City staff reviewed lawn fertilizer studies and neighboring communities' programs and ordinances concerning usage of lawn fertilizers and pesticides. A study completed by the City of Plymouth found that of 100 randomly taken soil samples, obtained in both commercial and residential areas, all contained excessive phosphorus. A number of Metro Area cities have ordinances controlling the use of fertilizers and pesticides. These ordinances regulate the type and usage of fertilizers.

Recommendations

It is recommended that a fertilizer and pesticide management ordinance be developed and adopted. Educational materials would target both residential and commercial users of fertilizers and pesticides. Further, in order to assist homeowners in choosing the correct lawn fertilizers, soil sampling kits would be made available to individual homeowners for a limited period of time to help generate interest.

Commercial fertilizer applicators currently must obtain a license to conduct business in the City. The proposed fertilizer and pesticide management ordinance would apply to commercial applicators, the suppliers of fertilizers and pesticides, and individual property owners who use these products.

Both commercial and non-commercial fertilizer applicators would have to use phosphate free fertilizers, with an exception for newly established or developed turf and lawns during their first growing season; or for lawns needing phosphorus, as indicated by a soil test.

Fertilizers and pesticides would not be allowed in vegetative buffer zones, except where approved as a means of controlling noxious weeds and invasive or exotic vegetation. The use of fertilizers would not be permitted below the ordinary high water level of a water body or within 15 feet of any wetland or watercourse. Fertilizers could not be applied to impervious surfaces, on frozen ground, or when conditions exist that would promote or create a runoff.



4.34 Private Storm Sewer Facility Maintenance Ordinance

Introduction

There are approximately 130 trap manholes and 30 storm water quality treatment ponds that are a part of private storm water drainage systems in Bloomington. These facilities were constructed to provide treatment of storm water runoff from private property prior to entering the public storm water management system. There is currently no requirement for maintenance (i.e. cleaning) of these facilities.

Discussion

These treatment facilities were constructed to provide protection to the public system. The ponds or trap manholes are designed to capture sediment carried by storm water runoff as well as other pollutants like oils and debris. They also provide a first line of defense for containment of hazardous materials spills.

The ponds and the trap manholes must be inspected and, if needed, cleaned to insure that they operate properly and provide the desired treatment of the storm water runoff. The proposed ordinance will provide the means to make sure that this action occurs.

Recommendations

A list of all known private trap manholes and storm water quality treatment ponds has been developed by the Public Works Department. It is recommended that an ordinance be developed that requires property owners to provide proof of inspection and, if necessary, cleaning (annually for trap manholes and every 3 years for water quality treatment ponds). If this action does not occur, the ordinance will give the City the authority to hire a contractor to enter the private property, inspect the facility and, if necessary, clean it. The cost will be billed to the property owner. The ordinance will require the Public Works Department to maintain the records for this activity.



4.35 Weed Ordinance

The City established a weed ordinance in 1959. This ordinance was last updated in 1981 (see Appendix F). It addresses the control of all noxious weeds or growing grass on any property within Bloomington.

This ordinance does not address buffer areas that are left unmowed and often reach a height greater than one foot. The ordinance requires that growing grass be maintained at a height of one foot, or less. In Section 4.22 of this plan, a vegetative buffer zone policy is recommended. If the recommendations of that policy are adopted by the City Council, appropriate changes would be necessary to the existing weed ordinance to allow designated natural vegetative buffer zones to grow to heights in excess of one foot.

4.36 Erosion Control Ordinance

The City enacted an erosion control ordinance in 1958. This ordinance was last updated in 1992. The City also adopted a steep slope ordinance in 1982 and updated it in 1993 (see Appendix F). Together, these ordinances fully address all current needs for erosion and sediment control. The MPCA's "Protecting Water Quality in Urban Areas," commonly known as "Best Management Practices in Minnesota" (October 1989), was adopted in the Erosion Control Ordinance. This document presents numerous methods of erosion and sediment control that can be used to minimize erosion and capture sediment carried by runoff from sites where bare ground is exposed. The City's Building and Inspections Division is charged with inspection for and enforcement of this ordinance. No additions or revisions to these ordinances are recommended at this time.



4.37 Shore Area Ordinance

In 1993, the City established shore area regulations. These regulations were developed under the flexibility provision of the state's model shoreland ordinance. The ordinance regulates (via permit) the use, development and alteration of shore areas. Topics covered include: shore area alterations such as the removal or alteration of vegetation, the use of fertilizer, grading and filling; control of structures including limits on the type, number, location and design of such; constraints for roads, driveways and parking areas; restrictions for water and sewage facilities, agricultural uses and storm water control.

The regulations apply to only those water bodies and watercourses identified by the MDNR as requiring coverage under a shoreland ordinance. They are listed in the Shore Area Ordinance, which is found in Appendix F. No changes are recommended for this ordinance.

4.38 Flood Plain Ordinance

The City joined the permanent Flood Insurance Program in 1981. A flood hazard overlay district for zoning purposes was adopted by ordinance in 1982 and last updated in 1992. The Flood Plain Ordinance, included in Appendix F, has been approved by the MDNR. The ordinance controls development activities in the flood plain for the purpose of reducing the possibility of property damage due to flooding. No changes to this ordinance are proposed.



4.40 Programs

4.41 Summary

The plan presents nine programs that affect wetlands. Four exist today in some form (street sweeping, public trap manhole maintenance, public storm water pond maintenance and park turf maintenance). The street sweeping program will be modified to sweep streets in priority watersheds first (i.e. those with high quality wetlands). Formal public trap manhole inspection and maintenance, and public storm water pond maintenance, programs will be developed to insure maintenance is performed when needed. The park turf maintenance policy will be revised to address vegetative buffer zones.

Five new programs will be developed. The education program will be a focal point of this plan. Much of the benefit to be derived from the implementation of this plan will come from educating the public about what wetlands are, why they are important and what individuals can do to help protect and preserve wetlands.

The second new program addresses methods for controlling invasive or exotic wetland vegetation. Such vegetation can choke out other types of vegetation and result in a significant loss of floral diversity and wildlife habitat.

The third new program is called the Adopt-A-Wetland Program. It is being developed to foster public involvement and to provide residents with hands-on opportunities for wetland protection. A neighborhood or group can “adopt” a wetland and volunteer for numerous tasks such as debris cleanup or exotic vegetation control.

The wetland banking program will be implemented to provide wetland mitigation sites within the City. These sites would be used to provide WCA-required wetland mitigation acres for future City projects that impact wetlands. If such a program is not begun, the City may find itself in the position of needing to acquire wetland property in other portions of the county to satisfy future mitigation requirements.

The fifth new program will establish methods for monitoring and evaluating the overall effect of implementing the recommendations in this plan. The biological and chemical condition of numerous wetlands will be monitored as a part of this program.

4.42 Education Program

Introduction

A major factor in the long term success of the City’s Wetland Protection and Management Plan will be the degree to which people adapt their activities to benefit the wetlands. The most effective way to bring about this change is through a comprehensive information and education program.

A recent survey of the public in Dakota County showed that there is a definite need to educate the public concerning water related resources. Many people do not understand the functions a wetland



performs. They also do not realize that storm sewers convey water directly to a water body or watercourse, or that their activities dealing with lawn and garden care or waste disposal can have a major impact on the quality of a wetland.

Discussion

The goal of this education program will be to increase the public's knowledge and awareness of the value of wetlands as a water resource and to stimulate public involvement in preserving and improving this resource. This goal will be met through the completion of the following action steps and will involve various target audiences in the City:

1. **Develop education information** for target audiences and distribute that information via various sources; articles in *Bloomington Briefs* and the *Bloomington Sun-Current*, presentations on cable TV, information brochures to be mailed city wide, and utility billing inserts. This information will explain what a wetland is and why it is valuable. Depending on the target audience, the information will provide specific recommendations for actions that groups can take to help preserve wetlands
2. **Prepare a bibliography and a web page** of sources for information and assistance with water resources issues, including wetlands.
3. **Establish a staff speaker program** to provide staff who can present basic information about wetlands and the city's Comprehensive Wetland Protection and Management Plan to interested groups in the City.
4. **Establish an "Adopt-a-Wetland" program** to encourage citizens to become more actively involved in preserving wetlands.
5. **Prepare a handout for all grading permit applicants** that explains the need for proper erosion control on a site and describes the steps needed to ensure that it occurs.

The Target Audiences Include:

- the general public
- shoreland owners
- business owners and operators
- developers and contractors
- government policy and decision makers
- city staff
- students and teachers



Recommendations

It is recommended that the City carry out the above public awareness programs. Implementation is recommended as follows:

1. Develop education information and distribute it to target audiences.

The first portion of the education plan will involve the preparation and distribution of a brochure that explains what a wetland is and why it is valuable. The brochure will explain the many functions a wetland can serve (floral diversity, wildlife habitat, fishery habitat, flood and storm water storage, water quality protection, shoreland protection, recreational/educational/aesthetic benefits, groundwater interaction and commercial uses). It will also describe the variety of wetlands in Bloomington, how wetlands have been affected by our past actions and why it is now important to preserve and improve wetland quality.

It is hoped that, by providing this information about the importance of wetland quality, people's awareness of the issue will be heightened and they will recognize there is a problem, what causes it and accept the solutions presented for addressing wetland quality issues.

The brochure will then present various actions that each target audience can take to become involved in preserving and improving wetlands.

The **general public** will be told about the effects of improper application of lawn and garden fertilizers and pesticides, the affects of the improper disposal of household hazardous materials, the improper disposal of lawn clippings and leaves and the improper disposal of pet wastes. Proper methods of dealing with these issues will be provided.

Shoreland owners will be told of the value of providing vegetative buffers around wetlands and that compost sites should be kept back from the shoreline.

Business owners and operators will be told of the value of proper parking lot maintenance (trash pickup, sweeping, catch basin cleaning), and proper disposal of hazardous materials.

Developers and contractors will be told about the benefit of proper erosion and sedimentation control on construction sites.

Copies of this brochure will be given to the **City Council, legal staff and planning staff**; along with a staff memo identifying possible changes or additions to City ordinances and policies that would aid the effort to preserve and improve the City's wetlands.

City staff involved in construction and maintenance will be given instruction in any changes in procedure or policy produced as a result of the adoption of this plan.

A number of steps will be taken to enhance the educational materials and opportunities for **students and teachers**. The City will work with the staff of the Minnesota Valley National Wildlife Refuge and the Hennepin Conservation District (HCD) to coordinate the acquisition of new educational materials, catalog the materials on hand at the City, the



Refuge resource library, web site contacts, and the HCD and notify the schools of the availability of the general wetland information brochure and provide copies to schools as requested.

- 2. Prepare a bibliography and a web page** of sources for information and assistance with water resources issues, including wetlands.

This document will be available through the City. It will list federal, state, regional, county and local sources of information concerning water resources. Its availability will be noted in the initial information brochure. It will be provided to K-9 teachers. The web page would include the bibliography and a section addressing current wetland issues.

See Appendix H for a list of sources for obtaining additional information.

- 3. Establish a program to provide staff as speakers** who can present basic information about wetlands and the City's Comprehensive Wetland Management Plan.

These individuals will be available to speak to schools, service organizations and neighborhood groups to further the education effort. A core presentation will be developed that can be modified based on the interests or needs of the audience.

- 4. Establish an "Adopt-A-Wetland" program** to encourage citizens to become more actively involved in preserving wetlands.

This program will enhance the education program and allow citizens to take ownership of the wetland plan by taking part in activities that will restore, enhance and protect wetlands. Examples of projects that a group can do under this program include buckthorn and purple loosestrife control, litter and trash removal, developing vegetative buffer zones and water quality monitoring.

- 5. Prepare a handout for all grading permit applicants** that explains the need for proper erosion control on a site and describes the steps needed to ensure that it occurs.

This handout will briefly explain the reason proper erosion control is necessary, provide information (including typical details) on the types that are available and provide information on proper maintenance.



4.43 Street Sweeping Program

Introduction

Each winter, street maintenance crews deposit salt/sand on Bloomington streets to provide safe driving conditions. Over the winter, the salt is washed out and only the sand remains. By spring, large amounts of sand have built up on the streets. With the spring rains, large amounts of sand are carried into the storm sewers and deposited in the City's wetlands and lakes.

Discussion

Certain wetlands and lakes have been identified for water quality protection. It is estimated that 15 to 20 percent of the sand used in the winter is deposited into the City's water bodies. By sweeping the streets in the drainage areas of these priority wetlands and lakes first, much of the sand can be picked up before it enters a water body.

Recommendations

The following revision to the existing Street Sweeping Program is recommended. The drainage areas of nine priority wetlands and lakes be swept first in the order listed.

Priority Sweeping List

- 1 Bush Lake Drainage Area
- 2 Lola Lake Drainage Area
- 3 West Marsh Lake Drainage Area
- 4 Lower Penn Lake Drainage Area
- 5 Oxboro Lake Drainage Area
- 6 North East Marsh Lake Drainage Area
- 7 Nord Myr Drainage Area
- 8 Lower Nine Mile Creek Drainage Area
- 9 Running Pond Drainage Area



4.44 Public Trap Manhole Maintenance Program

Introduction

The City currently has 76 trap manholes in the public storm sewer system. There is no formal procedure for inspection and maintenance of these structures. Maintenance is based on historic experience and the availability of equipment and labor

Discussion

Trap manholes must be inspected and maintained (cleaned) if they are to be effective. Development of a written plan that includes a schedule for inspection and cleaning will help insure that the structures are maintained in a timely manner. The existing historic knowledge of maintenance needs will be used to develop an efficient inspection schedule.

Recommendations

Street Maintenance Division staff and Engineering Division staff will work together to develop a maintenance inspection schedule. Street Maintenance will be responsible for the inspection, maintenance cleaning and record keeping for the program.



4.45 Public Storm Water Pond Maintenance Program

Introduction

The existing Storm Water Pond Detention Maintenance Program assures proper operation of the storm drainage system by maintaining the designed flow into and out of water bodies.

The City has an extensive storm sewer system. A major part of this system is natural water bodies and manmade ponds constructed for storm water detention. Over time, water flow into or out of the pond may be restricted due to sediment deposits or undesirable plant growth.

Discussion

In order to inspect and maintain inlets and outlets, site access is necessary. Many of the existing access easements to the water body inlets and outlets have become inaccessible for maintenance. Property owners have installed landscaping or built within the easement (i.e., trees, shrubs, gardens, retaining walls and small storage sheds). No access easements exist in some locations, making regular maintenance impossible.

Recommendations

The following are recommendations for additions to the City's Storm Water Pond Maintenance Program.

1. Maintenance Access In Existing Easements

Due to the need to maintain the inlets and outlets structurally as well as a need to remove sediment deposited below inlets, many of these easements will need to be made accessible. Public Works Department staff will prioritize the inlets and outlets, based on their historic maintenance needs, and recommend the necessary changes to make the easements accessible for maintenance equipment. Staff will work with property owners to facilitate these changes.

2. Access Easements to be Obtained

In many locations, no access easement exist. Public Works Department staff will prioritize the access easements needed and pursue their acquisition.

3. Inspection Program

Continue the City-wide inspection program of all inlets and outlets, sediment basins and forebays. Record baseline data on structural condition of inlet and outlet, amount of sediment buildup, site accessibility, easements in place or to be obtained and easement maintenance needed. Data will be entered into the Water Body Database. The continuing work will be completed using a seasonal intern to do the site visits and data entry. After the compiled data have been reviewed, a maintenance program will be developed.

4.46 Park Turf Maintenance Program



Introduction

The existing Park Turf Maintenance Program assures a detailed, well organized approach to turf maintenance. The wide variety of park users require many turf conditions and maintenance practices. Turf areas are broken down into six priority areas based on type, extent of use, and aesthetic value of the area. Priority IV addresses turf areas adjacent to pond or wetland areas. A summary of the Park Turf Maintenance Program can be found in Appendix G.

Discussion

Turf maintenance priority IV area consists of vegetation areas which are maintained at a minimal level, in a natural condition, or areas that do not have turf/vegetation to be maintained. Examples of priority IV areas are steep slopes, open, or natural areas that have not been converted to turf, and vegetative buffer areas adjacent to water bodies. Although the maintenance of vegetated buffer areas around water bodies is included in the priority IV areas, a specific policy for vegetated buffer zones does not presently exist. A new policy for vegetative buffer zones is proposed (Section 4.22) which recommends a vegetated buffer zone width depending on the class of wetland.

Recommendations

It is recommended that the City establish new, and maintain existing, vegetative buffer zone areas on public lands adjacent to water bodies as outlined in Section 4.22, Vegetative Buffer Zone Policy.



4.47 Invasive and Exotic Species Vegetation Control Program

Introduction

Invasive and exotic species, such as purple loosestrife, buckthorn, and Eurasian watermilfoil, often out compete native vegetation, decreasing the floral diversity of wetlands and areas adjacent to wetlands. Further, they disrupt the natural ecosystem, often do not have natural predators, and usually provide poor native wildlife habitat.

Currently, Bloomington does not have a management program for invasive and exotic species. Left unchecked, invasive and exotic species could spread throughout Bloomington - perhaps to uncontrollable levels. See Figure 8 for a map showing the location of wetlands with purple loosestrife and buckthorn infestation.

Discussion

1. Purple Loosestrife

Purple loosestrife is listed as a noxious weed by the Minnesota Department of Agriculture. Loosestrife is displacing native wetland plants at an alarming rate. When the conditions are right, a small isolated group of loosestrife plants can spread and cover a marsh in only one growing season. Loosestrife chokes out the diverse native vegetation and a wetland becomes monotypic. Waterfowl, muskrats and song birds will avoid wetlands that become dominated by loosestrife. It is a prolific seed producer. It can also propagate via rhizomes and sprouts from broken off plant parts.

In May through August 1995, a number of wetland sites were identified in Bloomington as having purple loosestrife infestation. There are three main areas of concern.

The first is the Upper Nine Mile Creek drainage area where purple loosestrife is established and growing throughout the Nine Mile Creek corridor. Uncontrolled, purple loosestrife could take over the corridor and destroy its habitat value.

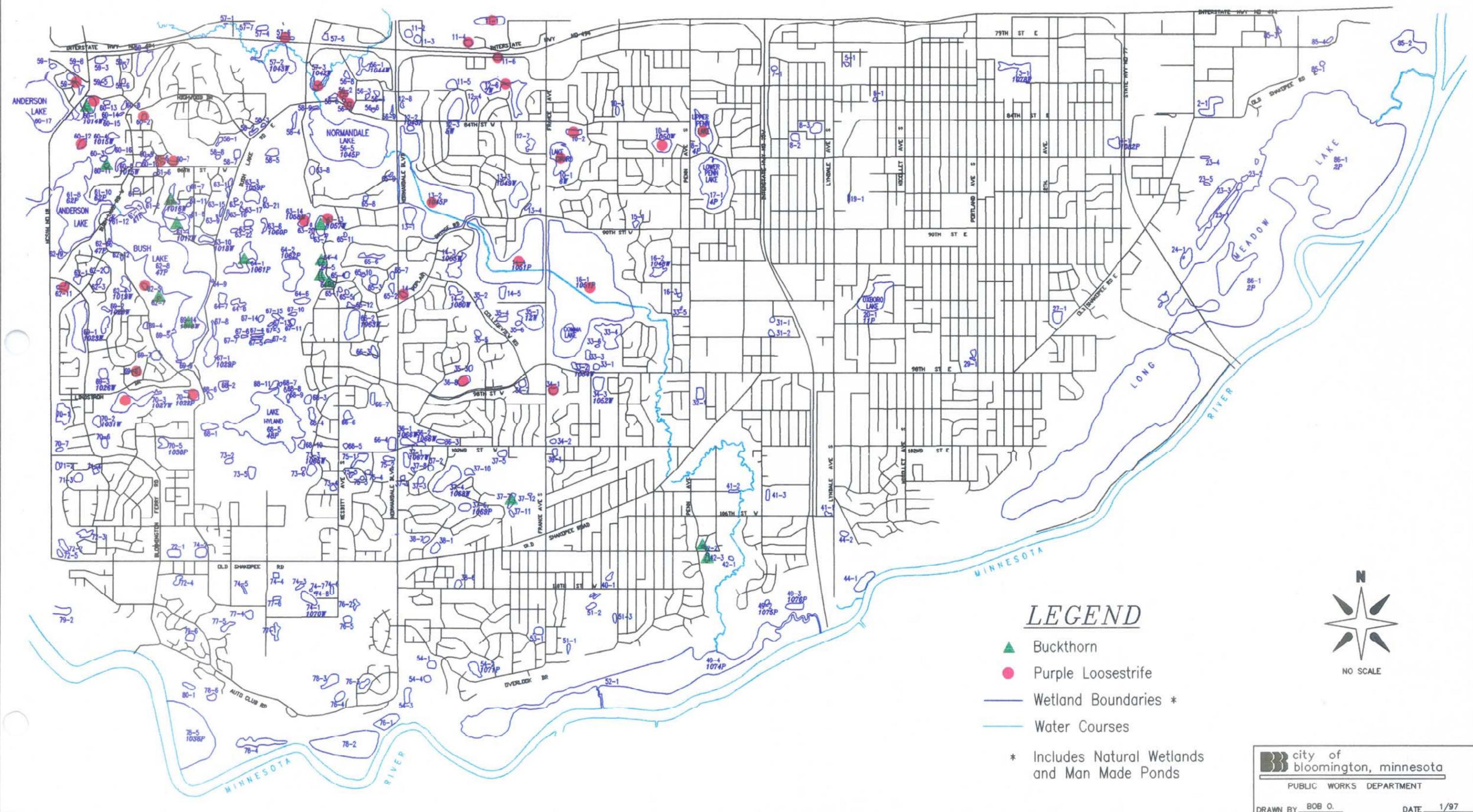
The second area of concern is the Warren Conservation Area, a designated conservation area with high quality, diverse in wildlife habitat. The purple loosestrife is at a stage that is easy to control by hand in this area. It is recommended that measures be taken immediately to eliminate the loosestrife population in this area.

The third area of concern is the Skriebakken drainage area, containing eight wetland complexes ranging in size from 1 to 22 acres. The Skriebakken area is adjacent to, and flows into, the Upper Nine Mile Creek drainage area. One-half of the wetlands in this area are infested with purple loosestrife. In the Lake Girard wetland complex alone, loosestrife comprises 25 percent of the vegetation.



FIGURE 8

BUCKTHORN AND PURPLE LOOSESTRIFE INFESTATION AREAS MAP



LEGEND

-  Buckthorn
-  Purple Loosestrife
-  Wetland Boundaries *
-  Water Courses
- * Includes Natural Wetlands and Man Made Ponds



Table 4.47a

Wetlands Infested with Purple Loosestrife				
Index Number	Wetland Name	Estimated Wetland Acreage	Estimated Purple Loosestrife Acreage	Recommended Action
08-01	Penn Lake, Upper	9.70	unknown	field visit August 1997
10-01	Girard Lake	21.32	4.26	beetle control
10-02	Girard Pond	3.47	0.24	beetle control
10-04	Adelmann Pond	7.13	0.36	hand/chemical control
11-01	Rauenhorst Pond	4.56	0.36	beetle control
11-04	ADC Pond	0.25	0.01	chemical control
11-06	Nord Marsh	1.52	0.15	beetle control
12-06	Wanda Miller Pond	18.24	small amount	hand control
13-02	Nord Myr	115.00	11.50	beetle control
14-01	Water Plant Pond	1.53	0.02	hand control
14-04	Marsh Lake, West	100.00	significant amount	beetle control
16-01	Marsh Lake, East	207.00	significant amount	beetle control
34-01	Braewood Pond	2.40	small amount	hand control
36-08	Tarnhill Park Pond	1.28	0.06	hand/chemical control
56-02	Norman Center Pond 2	0.62	0.01	hand control
56-07	Normandale Lake Office Pond , West & East	0.75	.01	hand/chemical control
57-03	Josten's Pond	18.00	0.90	beetle control
57-06	Leshum Pond	1.20	0.06	chemical control
59-02	West Line Pond	3.40	0.03	hand control
60-01	Tierneys Woods Pond	5.07	0.25	beetle control
60-02	Dewitt Pond	1.20	0.01	hand control
60-06	Autumn Chase Pond, West	0.25	0.01	hand control
60-07	Autumn Chase Pond, East	0.67	0.01	hand control
60-12	Tierneys Woods D	1.29	0.06	beetle control
62-05	Wiencke Pond	0.73	0.01	hand/chemical control
62-11	McDonald's Pond	0.65	0.01	hand control
63-13	Hutton Pond	7.33	0.07	hand/chemical control
63-14	Hennepin County Park Pond #5	4.68	0.05	hand control
69-08	Lindstrom Pond	0.54	0.01	hand control
70-03	Warren Conservation	13.30	0.13	hand control
70-04	Cemetery Pond	0.99	0.01	beetle control

Note: Extent of total cover observed June - August 1995.



2. Buckthorn

Buckthorn is a small tree/shrub introduced into the United States in the early 1900's as an ornamental planting and for creating dense hedge rows. Over the years, this very adaptable plant has invaded most woodland, and many wetland areas of the Twin Cities area and Bloomington. Left unmanaged, buckthorn becomes the dominant understory species reducing the diversity and integrity of these natural areas.

In May through August of 1995, a number of wetland sites in Bloomington were identified as having buckthorn infestations.

Table 4.47b

Wetlands Infested with Buckthorn			
Index Number	Wetland Name	Estimated Acreage	Estimated Buckthorn Acreage
37-07	Heritage Hills Pond, East	2.39	0.02
42-02	Morgan Hollow	0.37	0.02
42-03	Westwind Hollow	0.52	unknown
60-01	Tierneys Woods Pond	5.07	0.10
60-11	Tierneys Woods East	0.55	0.03
61-03	Bush Lake, North Arm	7.60	0.30
61-04	Bush Lake, East Bay	9.90	0.1
62-07	Bush Lake Park Pond	0.12	unknown
63-13	Hutton Pond	7.33	0.15
64-01	Hennepin County Park Pond #6	13.10	unknown
64-03	Willow Pond	0.13	0.01
64-04	Hyland Pond Q	0.30	0.01
64-05	Hyland Pond P	0.66	0.03
69-14	Bush Lake, South Bay	38.32	unknown

Note: Extent of total cover observed June - August 1995.

There are two areas of concern. The first is an area adjacent to Bush Lake known as Bush Lake North Arm (61-03) and Bush Lake East Bay (61-04). The East Bay area contains 1 percent buckthorn. The North Arm area contains large sections dominated by it.

The second area is Tierney's Woods Park. The vegetation in wetlands 60-01 (Tierney's Woods Pond) and 60-11 (Tierney's Woods East) is 2 to 3 percent buckthorn.

These wetland areas are either within a park or on publicly owned land. They are in areas of high wildlife usage. As buckthorn invades, these areas will lose valuable wildlife habitat.



3. Eurasian Watermilfoil

Eurasian watermilfoil is a rooted plant consisting of a reddish-brown stem with many branches and dark-green, feathery leaves grouped in clusters of four around the stem. In late summer, a 1-inch-long flower spike of tiny yellow flowers sticks up above the water surface. It grows in depths of up to 15 feet in sandy, mucky, or rocky bottoms.

Because it often forms dense surface mats, which shade native plants and interfere with water recreation, Eurasian watermilfoil has been designated by the MDNR as an undesirable exotic aquatic plant in Minnesota.

Bush Lake and two connected wetlands have been identified as having Eurasian watermilfoil. The lake has been chemically treated with Aqua-Kleen to provide control of the large established areas; however, this will not eliminate the plant from the lake.

RECOMMENDATIONS

1. Purple Loosestrife

It is recommended that the State noxious weed specialist be contacted concerning the latest techniques for controlling purple loosestrife (beetles, pesticide, etc.). Other recommendations are as follows:

1. Limit seed source, remove flowering heads before going to seed, dispose of by drying or burning.
2. Spot spraying with pesticides (MDNR permit required).
3. Pull or dig out by hand.
4. Removal by excavating and disposing of the root structure in the winter months.
5. Monitor wetlands for new loosestrife populations.

These methods of control could be done by homeowners, volunteer groups or City forces (including Sentenced to Serve crews). A purple loosestrife program for monitoring and controlling growth could be implemented through the Adopt-A-Wetland program, as outlined in Appendix G.

2. Buckthorn

It is recommended that a program for buckthorn removal be implemented. The goal for this being to restore native plant communities in designated natural areas, private wetland areas and other park locations by controlling and removing non-native invasive species. A buckthorn removal program could be implemented through the Adopt-A-Wetland Program, as outlined in Appendix G.



3. Eurasian Watermilfoil

Continue to treat the Eurasian watermilfoil by approved MDNR methods, hand pulling and herbicide applications. Prevent the spreading of watermilfoil by posting warning signs at the boat accesses explaining the need to remove all plant fragments from the boats and trailers or any other equipment after leaving the water.

4. Related Issues

In some instances, an event or series of events allows one type of vegetation to become dominant in a wetland (e.g., cattails or reed canary grass). In cases where monotypic vegetation is determined to be detrimental, large scale control is a possible solution. Monotypic vegetation control is estimated to cost \$20,000 per acre.

4.48 Adopt-A-Wetland Program

Introduction

The City presently does not have a formal program to utilize volunteer groups for the improvement and upkeep of the fringe of wetlands or watercourse areas within the city. Many of the City's wetlands are adjacent to city park or public open space lands.

Discussion

The Adopt-A-Wetland program is modeled after the Minneapolis Park and Recreation Board's Adopt-A-Park Program. Adopt-A-Wetland Programs, like Minneapolis', have several advantages including: providing higher quality recreational facilities without additional costs, providing local volunteer groups a sense of pride and ownership, and improving the condition and aesthetic beauty of wetlands.

Bloomington's Adopt-A-Wetland Program will utilize volunteer groups to perform various duties outlined in a Task Agreement. Tasks may include litter pickup, purple loosestrife control and monitoring, buckthorn control, and water quality data collection for various wetlands.

The program would be implemented and supervised through the City Park Maintenance Division. Interested volunteer groups would be given a packet of materials including: an Adopt-A-Wetland Agreement, Task list, safety guidelines brochures, and liability waivers. After reviewing the materials, volunteer groups will meet with the appropriate Park Maintenance personnel to discuss the details and scheduling of the services the group would perform. See Appendix G for details on the proposed Adopt-A-Wetland Program.



Recommendations

An Adopt-A-Wetland Program should be developed and implemented to provide a means for interested citizens to become actively involved in the protection and enhancement of the City's wetlands.

4.49 Wetland Banking Program

Introduction

The Wetland Conservation Act's goal is to achieve "no-net loss in the quantity, quality and biological diversity of Minnesota's wetlands." A wetland bank is a system of identifying wetlands that have been restored or created for replacement credit. The "banked" acres can be used as mitigation acres for projects that impact wetlands and require wetland replacement plans.

Discussion

City of Bloomington construction projects might impact wetlands by disturbing vegetation, filling or draining. Wetland impacts are covered under Wetland Conservation Act Rules, Chapter 8420, part 8420.0210, Exemption Determinations; and part 8420.0540, Replacement Plan Evaluation Criteria.

Non-exempt wetland impacts must be replaced (mitigated) at a 2:1 ratio. This means creating new wetland areas or restoring existing disturbed wetlands. It is often difficult to identify and/or obtain sites for wetland mitigation. The banking program allows new wetlands to be built and/or existing sites to be restored and "deposited in a bank". If a future project impacts a wetland, banked credits can be withdrawn and used to meet the mitigation requirements.

Many of the City's predevelopment wetlands were drained, filled and built upon as Bloomington developed. As a result, locations for potential wetland restoration or wetland creation for banking are difficult to obtain.

Two sites within the City have been identified as potential wetland restoration /creation sites. These proposed acres would be banked as outlined in the Wetland Conservation Act Rules, Chapter 8420, part 8420.0700, Standards and Criteria for State Wetland Banking.

Site 1: Lake Girard Park

Lake Girard Park is located at the southeast quadrant of France Avenue and West 84th Street. This park area is currently open space. This area was wetland prior to the late 1950s, when it was used as a spoil disposal area for residential construction. A large wetland complex still exists adjacent to this area. It consists of a mix of Type 1, 3 and 4 wetlands.

Approximately two acres of wetland could be restored at this location to either a Type 2 or a Type 3 wetland. Adjacent upland could also be restored to a natural prairie condition.



Site 2: Smith Pond

Smith Pond is located within Smith Park at Chicago Avenue between East 80th Street and East 82nd Street. A large portion of this area was filled in the 1950s and developed for commercial and residential use. An expansion of Smith Pond is proposed at this time to incorporate regional water quality treatment, wetland enhancement and park improvements.

Types 2 and 3 wetland would be created or enhanced at this location.

Recommendations

It is recommended that the City adopt the Girard Park and Smith Pond sites as mitigation sites for possible future City impacts on Bloomington wetlands. Additional mitigation sites for banking should be identified.

4.50 Monitoring and Evaluation Program

Introduction

The success of the implementation of the recommendations in this plan must be quantified via a program of monitoring and evaluation. Such a program will also provide an effective means of determining what plan revisions may be necessary in the future.

It would be difficult, at best, to determine the proportional benefit of implementing the various individual plan elements. A determination of the overall condition of the wetlands, using biological and chemical assessment techniques, would appear to be the most practical approach.

Discussion

The City's current stormwater monitoring program began in late 1994. The first full year of sampling did not occur until 1995 and focused on meeting future NPDES requirements. Storm water samples are taken in the storm sewer pipe upstream of the receiving water body or watercourse. The storm water is tested for 11 constituents. This will allow the City to compile baseline data on pollutant loads, identify high priority pollutants, detect illegal discharges, and determine the need for appropriate storm water BMP's and treatment. Year end storm water monitoring reports for 1994, 1995, and 1996 can be found in the Bloomington Public Works library.

Biological and chemical studies have been conducted on a few water bodies in the City. The biological studies have included identification and counts of aquatic invertebrates, identification and counts of aquatic and benthic organisms, studies of fish (particularly fish disease and fish stunting).



Chemical studies have included laboratory water tests to measure pH, dissolved oxygen, biological oxygen demand, nitrates, phosphorus, standard plate count and suspended solids. (The City's water plant laboratory has the capability to conduct these analyses.) These studies have also included field tests to measure water temperature and clarity.

Recommendations

It is recommended that the City confer with the appropriate government agencies and private consultants to determine the best methods of monitoring and evaluating wetland conditions. Then the implementation schedule will be updated to more accurately reflect the cost and effort required for this task.

A program that assesses the biological and chemical condition of specific target wetlands on a regular basis, over a number of years is envisioned. In addition, a survey of residents might be appropriate in two or three years to determine if the education program has had an impact.



5.0 Improvements, Operation, and Maintenance

5.10 Introduction

This plan recommends a number of improvements to the existing storm water management system infrastructure. The proposed improvements will improve the quality of storm water runoff that flows into a wetland by removing sediment and other suspended or floating pollutants from the water. These improvements will be constructed under a capital improvements program which will have funds approved as a part of the City's annual budget process.

Formal operation and maintenance plans will be developed and implemented to insure that new and existing storm water treatment improvements operate effectively. The estimated cost of providing inspection and maintenance is included in the implementation plan.

The implementation plan is provided in Table 6.10.

5.20 Capital Improvements

5.21 Discussion

Many of the wetlands in Bloomington are connected to the storm sewer system. They are used for storm water detention and, secondarily, as storm water quality treatment facilities. While removal of sediment and the associated pollutants that attach to sediment is one of the recognized functions of a wetland, there is a limit to the amount of storm water runoff that a wetland can effectively treat. This ability (and thus the value of the function) is compromised if a large volume of water is conveyed through the wetland at a rapid rate. This condition exists at most of the wetlands that have storm sewers entering them.

The use of wetlands for storm water detention is a critical function in many areas. Changing this condition to route storm water around a wetland would require the acquisition of developed land. Homes and businesses would be displaced and exorbitant capital costs would be incurred to change the storm sewer system.



5.22 Conclusions

The recommended structural improvements will reduce the volume of sediment that reaches wetlands. This reduction in sediment load will result in a more healthy wetland and improve the wetland's ability to treat storm water runoff that passes through it.

The existing storm sewer system was reviewed to determine where it would be feasible to build structural facilities to provide sediment removal. Three different methods are recommended: forebays, sedimentation basins and trap manholes. A forebay is an area that is located immediately adjacent to, or in a shallow portion of, a wetland that traps sediment and debris. A sedimentation basin performs the same function, but is located in an upland area. The trap manhole captures larger-sized sediment particles, floating pollutants and debris. A trap manhole is built on a storm sewer line before it enters a wetland.

The plan recommends the construction of 11 forebays, 4 sedimentation basins and 50 trap manholes as shown in Table 5.21. The location of these improvements is shown on Figure 9.

Two caveats apply to these recommendations. First, a number of the recommended forebay sites would require filling in the wetland. WCA requires mitigation of the filled wetland area at a 2 to 1 ratio. Staff recommends waiting to construct these forebays until a revision to the WCA, that would make such work exempt from the mitigation requirement, is brought before the legislature. Representatives from the BWSR and the MDNR have been approached with this concept; and it is hoped that the agencies, with support from metro area cities, will introduce such a proposal to the legislature.

The second issue concerns the effectiveness of trap manholes; which has not been fully proven by field studies. Many of these structures are being installed in other cities within the Twin Cities metropolitan area and nationwide. The plan recommends constructing a total of five trap manholes at two different wetlands and establishing a program to sample and test storm water runoff entering and leaving the structures and the wetlands. If the results show definite benefit from the trap manholes, the remaining 43 structures would be built over a number of years. The plan also calls for the construction of two trap manholes at two exceptional quality wetlands.



SUMMARY OF PROPOSED CAPITAL IMPROVEMENTS

<u>Drainage Basin</u>	<u>Wetland #</u>	<u>Wetland Name</u>	<u>Proposed Improvement</u> ⁽¹⁾
11th Avenue	27-01	Running Pond	Sediment Basin
Brookside	34-03	Brookside Pond	Forebay, Trap Manhole
	39-01	Canterbury Oaks Pond	Trap Manhole
Bush Lake	60-05	Bogen Pond	Trap Manhole
Hampshire Pond	79-06	Minnesota Bluffs Pond	Trap Manhole
Hyland Hills - Colorado Pond	75-01	Timberglade Pond, N	Trap Manhole (3)
	75-02	Berkshire Pond	Trap Manhole
Oxboro Lake	20-01	Oxboro Lake	Trap Manhole
	08-03	Bryant Pond, Upper	Repair & enlarge existing forebay
Penn Lake	16-02	Barthel's Pond	Forebay
	17-01	Penn Lake, Lower	Rebuild existing sediment basins
Riley - Purgatory Creek	62-01	Amsden Ridge Pond	Trap Manhole
	62-02	Marce Woods Pond, N	Trap Manhole
	62-03	Marce Woods Pond, S	Trap Manhole
	69-01	Woodbridge Marsh	Trap Manhole (2)
	69-03	Duck Pond, S	Trap Manhole (2), Sediment basin
	69-08	Lindstrom Pond	Trap Manhole
	70-03	Warren Conservation	Trap Manhole
	70-05	Utah Pond 2	Trap Manhole
Skriebakken	10-01	Girard Lake	Sediment basin
	10-02	Girard Pond	Sediment basin
	13-03	Skriebakken Pond	Forebay (3)
Smith Pond - Wright's Lake	04-01	Wright's Lake	Forebay, Trap Manhole
South Glen	37-01	Scarborough, NW	Trap Manhole (2)
	37-04	Ancel Glen Pond	Forebay, Trap Manhole (3)
SW Marsh Lake	36-08	Tarnhill Park Pond	Trap Manhole, Forebay
	13-02	Nord Myr	Trap Manhole (3)
	14-04	Marsh Lake, W	Trap Manhole (2)
	16-01	Marsh Lake, E	Trap Manhole (2)



SUMMARY OF PROPOSED CAPITAL IMPROVEMENTS

<u>Drainage Basin</u>	<u>Wetland #</u>	<u>Wetland Name</u>	<u>Proposed Improvement</u> ⁽¹⁾
Upper Nine Mile Creek	56-05	Normandale Lake	Trap Manhole (2)
	60-02	Dewitt Pond	Trap Manhole
	61-08	Anderson Lake, SE	Trap Manhole
	63-08	Bernardi's Pond	Trap Manhole
	63-13	Hutton Pond	Trap Manhole
	63-14	Hennepin County Park Pond #5	Trap Manhole
	58-02	Kingslee Pond South	Trap Manhole
West Marsh Lake	14-01	Water Plant Pond	Trap Manhole (2)
	14-03	Kingsdale Pond	Trap Manhole (2)
	65-03	Green Briar 2nd Pond	Trap Manhole (2)
	66-02	St. Edward Pond*	Trap Manhole
York Nine	40-01	Xerxes Pond	Trap Manhole (2)

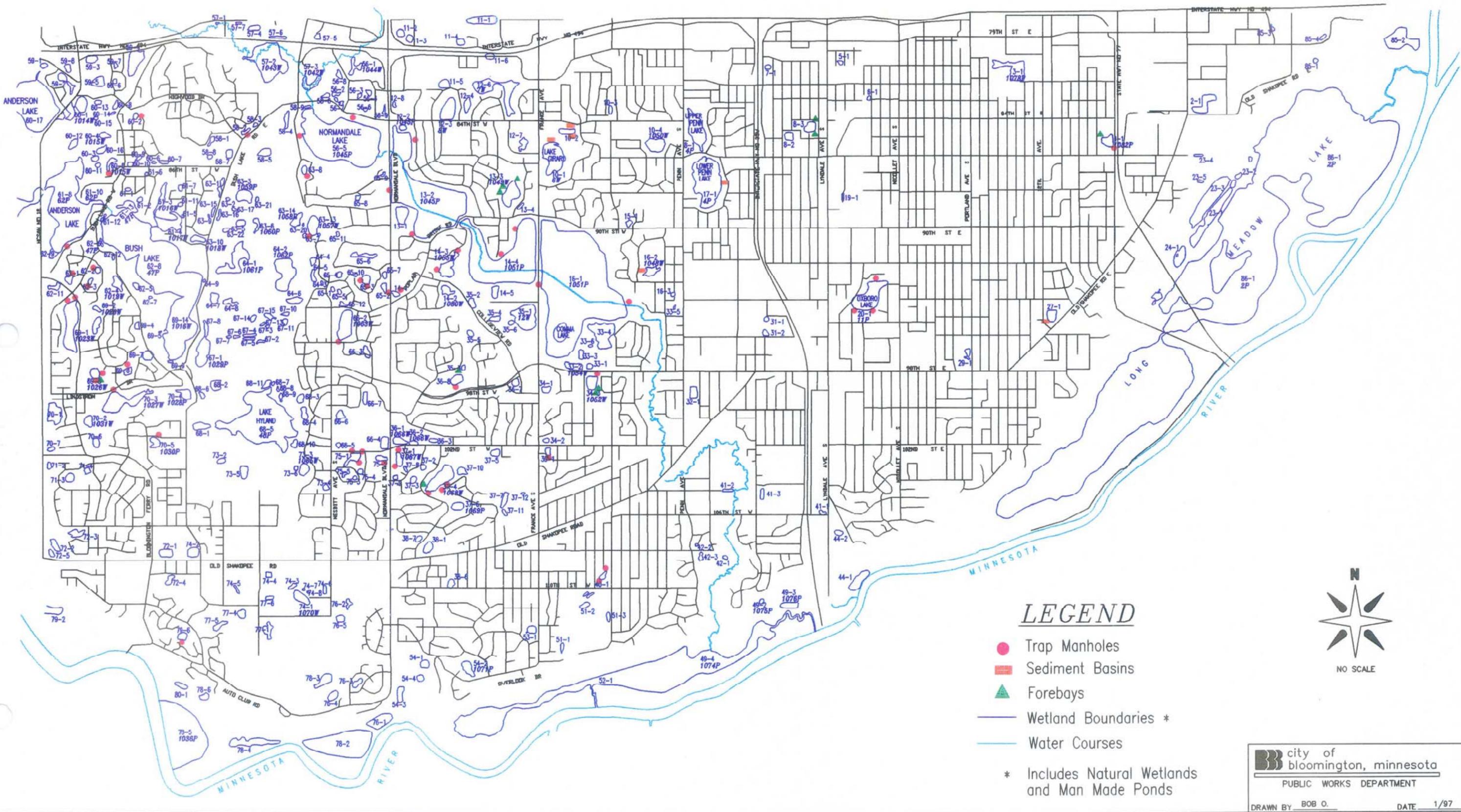
⁽¹⁾ A number shown in parenthesis indicates the total number of a specific type of improvement that are recommended for construction.

* Manmade basin



FIGURE 9

PROPOSED CAPITAL IMPROVEMENTS MAP



LEGEND

- Trap Manholes
- ▭ Sediment Basins
- ▲ Forebays
- Wetland Boundaries *
- Water Courses
- * Includes Natural Wetlands and Man Made Ponds



5.30 Operation and Maintenance

5.31 Discussion

All of the proposed and existing structural features of the storm water management system that provide removal of sediment or other pollutants from storm water must be maintained. Once a certain volume of sediment collects in the treatment structures they become ineffective. Inspection of these features is necessary if an efficient, effective maintenance (i.e., cleaning) program is to be developed.

5.32 Conclusions

Sections 4.44 and 4.45 of the plan address the development of formal inspection and maintenance plans for trap manholes and storm water ponds (includes sedimentation basins and forebays). The implementation plan lists inspection and maintenance as an annual task and assigns an estimated cost to the task for budgeting purposes.



6.0 Implementation Plan and Prioritization

6.10 Prioritization Process and Implementation Plan

The prioritizing of task completion that is presented in the implementation plan was developed by giving consideration to:

- the relative importance of the task,
- the availability of funding,
- the availability of staff,
- time required to obtain and analyze test results at pilot installations,
- phased improvements, and
- dependence on action by entities outside of the City.

In the case of the education program, the primary concern was to provide an initial large-scale effort to distribute basic educational materials to all citizens. Other factors considered were: the time of year the activity would have to occur (staff availability) and spreading the cost somewhat evenly over the main implementation period (for Alternatives 1 and 2).

The policy, ordinance and program revisions were scheduled based on the relative importance of each and the staff time required. Only one major ordinance or policy consideration was scheduled per year.

The capital improvements were scheduled based on the relative importance of the wetlands being protected, availability of funds, the need to wait for other projects affecting a wetland to be completed, testing the effectiveness of pilot installations (the trap manhole program) and dependence on action by the state legislature to change the WCA mitigation requirements.

6.20 Responsibility

The implementation plan lists the division or department in the City that would perform a given task. Many of the policy, ordinance and program recommendations will require the efforts of multi-disciplinary teams. In these cases, the City division or department best suited to serve as the team leader is listed.

6.30 Funding

Possible sources of funding for each task are shown in the implementation plan. Staff will pursue all know possibilities for grants in an attempt to reduce the cost to the City. In addition, other options such as partnering, cost-sharing and sponsorships will be considered.



Cost Summary for Implementation Plan and Wetland Protection and Management Plan

Table 6.10
(1 of 6)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total Category Cost
Education Alternative #1	\$78,300	\$62,800	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$199,100
Cost to City (with grant)	\$19,575	\$15,700	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$93,275
Education Alternative #2	\$86,745	\$71,655	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$216,400
Cost to City (with grant)	\$21,685	\$17,915	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$97,600
Education Alternative #3		\$53,940	\$22,425	\$52,640	\$20,535	\$31,860	\$7,000	\$7,500	\$7,000	\$7,500	\$210,400
Programs/Ordinances	\$13,300	\$26,750	\$15,750	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$141,550
Wetland Capital Improvements	\$48,700	\$58,200	\$116,700	\$132,700	\$90,700	\$102,700	\$113,800	\$145,900	\$60,400	\$4,000	\$873,400
Yearly Totals*	\$62,000	\$138,890	\$154,875	\$197,590	\$123,485	\$146,810	\$133,050	\$165,650	\$79,650	\$23,750	\$1,225,350⁽¹⁰⁾

All costs in 1996 dollars.

* Assuming Education Alternative #3

Footnotes

- (1) Hire half-time coordinator for 2 years, obtain Twin Cities Water Quality Initiative Program (TCWQIP) grant. All costs shown in 1996 dollars.
- (2) Hands-on teaching materials for schools and youth organizations.
- (3) Pay for soil test on up to 2000 residential properties to encourage owners to test for fertilizer needs.
- (4) Could be set up at schools, libraries, etc.
- (5) Build a dock on a wetland that can hold up to 20 people - would be utilized for educational purposes.
- (6) 1040 hours per year.
- (7) Assign staff to coordinate program - obtain TCWQIP grant. All costs shown in 1996 dollars.
- (8) 1040 hours per year.
- (9) Assign staff to coordinate - do not obtain TCWQIP grant. All costs shown in 1996 dollars.
- (10) Assumes Education Alternative #3. If Education Alternative #1 is assumed, the total cost to the City would be \$1,108,225. If Education Alternative #2 is assumed, the total cost to the City would be \$1,111,250.

Education Program

(2 of 6)

Alternative #1 ⁽¹⁾		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Responsible Division	Possible Funding Source	Comments
1	Develop, print, & distribute color informational brochure to all City addresses	\$34,000										Engineering	a,b,c	
2	Develop, print, distribute resource bibliography	\$5,000										Engineering	a, b, c	
3	Develop web page	\$2,000		\$500		\$500		\$500		\$500		Engineering	a, b, c	
4	Develop, print, & distribute watershed-specific information door hangers	\$6,000										Engineering	a, b, c	
5	Utility billing insert			\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	Miscellaneous information items/reminders
6	Briefing articles			\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	Engineering	a, b	Miscellaneous information items/reminders
7	Assemble wetland teaching trunks ⁽²⁾		\$2,000									Engineering	a, b, c	
8	Assemble and distribute media packets	\$500										Engineering	a, b, c	
9	Purchase and distribute teaching posters to schools		\$3,000									Engineering	a, b, c	
10	Cable TV information video		\$5,000									Engineering	a, b, c	
11	Fund 2000 soil tests ⁽³⁾	\$7,000	\$7,000									Environmental Services	a, b, c	
12	Develop traveling education display ⁽⁴⁾		\$7,500									Engineering	a, b, c	
13	Wetland teaching platform ⁽⁵⁾		\$10,000									Engineering	a, b, c	
14	Organize "Clean Water Week"		\$4,000									Engineering	a, b, c	
15	Coordinator ⁽⁶⁾	\$19,800	\$20,300									Engineering	a, b, c	
16	Staff time	\$4,000	\$4,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b, c	
17	Total Cost	\$78,300	\$62,800	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total = \$199,100
18	Total Cost to City (with Grant)	\$19,575	\$15,700	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total Cost to City = \$93,275

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

Education Program

(3 of 6)

Alternative #2 ⁽⁷⁾		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Respon- sible Division	Possible Funding Sources	Comments
1	Develop, print, & distribute color informational brochure to all City addresses	\$34,000										Engineering	a, b, c	
2	Develop print, distribute resource bibliography	\$5,000										Engineering	a, b, c	
3	Develop web page	\$2,000		\$500		\$500		\$500		\$500		Engineering	a, b, c	
4	Develop, print, & distribute watershed - specific information door hangers	\$6,000										Engineering	a, b, c	
5	Utility billing insert			\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	Miscellaneous information items/reminders
6	Briefing articles			\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	Engineering	a, b	Miscellaneous information items/reminders
7	Assemble wetland teaching trunks ⁽²⁾		\$2,000									Engineering	a, b, c	
8	Assemble and distribute media packets	\$500										Engineering	a, b, c	
9	Purchase and distribute teaching posters to schools		\$3,000									Engineering	a, b, c	
10	Cable TV information video		\$5,000									Engineering	a, b, c	
11	Fund 2000 soil tests ⁽³⁾	\$7,000	\$7,000									Environmental Services	a, b, c	
12	Develop traveling education display ⁽⁴⁾		\$7,500									Engineering	a, b, c	
13	Wetland teaching platform ⁽⁵⁾		\$10,000									Engineering	a, b, c	
14	Organize "Clean Water Week"		\$4,000									Engineering	a, b, c	
15	Staff time ⁽⁸⁾	\$32,245	\$33,155	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b, c	
16	Total Cost	\$86,745	\$71,655	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total =\$216,400
17	Total Cost to City (with Grant)	\$21,685	\$17,915	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total Cost to City = \$97,600

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

Education Program

(4 of 6)

Alternative #3 ⁽⁹⁾		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Responsible Division	Possible Funding Sources	Comments
1	Develop, print, & distribute color informational brochure to all City addresses		\$34,000									Engineering	a, b	
2	Develop, print, distribute resource bibliography			\$5,000								Engineering	a, b	
3	Develop web page ⁽⁵⁾				\$2,000		\$500		\$500		\$500	Engineering	a, b	
4	Develop, print, & distribute watershed - specific information door hangers				\$6,000							Engineering	a, b	
5	Utility billing insert			\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	Miscellaneous information items/reminders
6	Briefing articles			\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	Engineering	a, b	Miscellaneous information items/reminders
7	Assemble wetland teaching trunks ⁽²⁾				\$2,000							Engineering	a, b	
8	Assemble and distribute media packets		\$500									Engineering	a, b	
9	Purchase and distribute teaching posters to schools				\$3,000							Engineering	a, b,	
10	Cable TV video information				\$5,000							Engineering	a, b,	
11	Fund 2000 soils test ⁽³⁾		\$7,000	\$3,500	\$3,500							Environmental Services	a, b	
12	Develop traveling education display ⁽⁴⁾					\$7,500						Engineering	a, b	
13	Wetland teaching platform ⁽⁵⁾						\$10,000					Engineering	a, b	
14	Organize "Clean Water Week"						\$4,000					Engineering	a, b	
15	Staff time		\$12,440	\$8,925	\$26,140	\$8,035	\$12,360	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	
16	Total Cost		\$53,940	\$22,425	\$52,640	\$20,535	\$31,860	\$7,000	\$7,500	\$7,000	\$7,500			Total Cost = \$210,400

Policies, Ordinances and Programs

	Wetland Policies Ordinances & Programs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Respon- sible Division	Possible Funding Sources	Comments
1	Vegetative Buffer Zone Policy		\$7,000									Engineering	a, b	Considerable staff time from Public Works, Planning, Legal, Environmental Services
2	Wetland Modification Assessment Policy	\$500										Engineering	a, b	Revise policy
3	Aquatic Plant Chemical Treatment Policy		\$5,000 (database) \$5,000 (sampling)	\$5,000 (sampling)	Environmental Services	a, b	Database development and water quality sampling program							
4	Wetland Ordinance	\$1,300										Engineering	a, b	Revise ordinance to adopt WPMP
5	Fertilizer and Pesticide Management Ordinance			\$3,500								Planning	a, b	Develop new ordinance
6	Private Trap Manhole/ Pond Maintenance Ordinance	\$5,500	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	Engineering	a, b	\$2,000 to establish data base using summer intern - Public Works, Legal, Environmental Services involved in ordinance draft
7	Weed Ordinance		\$1,000									Environmental Services	a, b	Dependent on adoption of buffer policy (revise ordinance)
8	Shore Area Ordinance		\$1,000									Planning	a, b	Dependent on adoption of buffer policy (revise ordinance)
9	Street Sweeping Program	\$250										Street Maintenance	a, b	No additional cost - utilize map developed by the Wetland Advisory Committee
10	Public Storm Water Trap Manhole Maintenance Program	\$1,000										Street Maintenance	a, b	Formalize inspection - no additional cost - current maintenance task
11	Public Storm Water Pond Maintenance Program	\$1,000											a, b	Formalize inspection - no additional cost - current maintenance task
12	Park Turf Maintenance Policy		\$500									Park Maintenance	a, b	Possible cost - dependent on adoption of buffer policies
13	Invasive and Exotic Species Vegetation Control Program	\$1,750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	Park Maintenance	a, b	Purple loosestrife control via beetles
14	Adopt-A-Wetland Program	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	Park Maintenance	a, b	Program administration
15	Wetland Banking Program	\$1250										Engineering	a, b	40 hours when a project occurs
16	Monitoring and Evaluation Program		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	Engineering		
17	Total Cost	\$13,300	\$26,750	\$15,750	\$12,250			Total Cost = \$141,550						

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

Capital Improvements and Maintenance

(6 of 6)

	Wetland Capital Improvements	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Responsible Division	Possible Funding Sources	Comments
1	Lower Penn Lake		\$30,000									Engineering	a, b	Rebuild existing sediment basin (maintenance project)
2	Running Pond	\$30,000 Imp. Proj \$7,500 Parks										Engineering	a, b	Sediment basin Parks and Recreation participation
3	Duck Pond			\$10,000								Engineering	a, b	Sediment basin
4	Ancel Glen Pond			\$35,000								Engineering	a, b	Forebay
5	Wright's Lake*				\$127,000							Engineering	a, b, d	Forebay - (wetland mitigation cost is included)
6	Skriebakken Pond*					\$85,000						Engineering	a, b, d	Forebays (three)
7	Brookside Pond*						\$40,000					Engineering	a, b, d	Forebay
9	Upper Bryant Pond			\$66,000								Engineering	a, b, d	Repair & enlarge existing forebay
10	Tarnhill Pond							\$20,000				Engineering	a, b, d	Forebay (in conjunction with purple loosestrife control program)
11	Girard Lake/Pond								\$81,000			Engineering	a, b	Sediment basins (in conjunction with purple loosestrife control program)
12	Barthel's Pond							\$30,000				Engineering	a, b, d	Forebay
13	Trap Manholes 70-03,58,02	\$11,200 (two)										Engineering	a, b	Improvement project (wetlands on the preserve list)
14	Trap Manholes 65-03(two), 37-04 (three)		\$28,000 (five) (Pilot)	\$5,000 (Sampling)	\$5,000 (Sampling)	\$5,000 (Sampling)						Engineering	a, b	Improvement project Pilot program (five trap manholes)
15	Remainder of Trap Manholes						\$62,000	\$62,000	\$62,000	\$56,000		Engineering	a, b	Improvement projects-eleven per year
16	Trap Manhole Maintenance		\$200	\$700	\$700	\$700	\$700	\$1,800	\$2,900	\$4,000	\$4,000	Street	a, b	Annual Expense (in addition to existing maintenance costs)
17	Cost Totals	\$48,700	\$58,200	\$116,700	\$132,700	\$90,700	\$102,700	\$113,800	\$145,900	\$60,000	\$4,000			Total: \$873,400

* Need permits, WCA mitigation involved; should wait for legislative change

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

7.0 Special Considerations

7.10 Minnesota River Valley Wetlands

As stated in the Executive Summary, this plan does not address the wetlands in the City that are located below the bluff of the Minnesota River Valley. These wetlands are not included for a number of reasons.

The entire area below the bluff is designated as a conservation area in the City's Comprehensive Plan. As such, the area would remain in a natural condition to protect habitat, wildlife and open space. The major impacts to the wetlands in the river valley are inundation due to flooding of the Minnesota River and the discharge of storm water from the City's storm sewer outfalls.

The river valley is owned by either the US Fish and Wildlife Service (USF&WS), the City of Bloomington, or private citizens. Much of land is slated for acquisition by the USF&WS to be managed as part of the Minnesota Valley National Wildlife Refuge.

In meetings with staff of the USF&WS and the MDNR, the primary concern that was identified was the pollutants carried to the wetlands by storm water runoff. It was agreed that this issue that can be most effectively addressed in the City's comprehensive surface water management plan.

7.20 Regional Storm Water Quality

One of the primary issues that the City's comprehensive surface water management plan will consider is that of treating storm water runoff via regional facilities (i.e., providing basins to treat the storm water runoff from large areas of the City -- 100 to 500 acres, for example). The current storm water management system configuration utilizes many of the natural wetlands for storm water detention to reduce flooding problems in upland areas. These wetlands also provide a secondary benefit of water quality treatment for the storm water runoff. However, the wetlands' natural capacity to assimilate nutrients and capture pollutants is often exceeded due to the volume of water that is routed through the wetlands.

The comprehensive surface water management plan will address how the City will determine the ability of the wetlands to function as storm water runoff quality treatment facilities, where changes should be made to protect certain wetlands and where certain wetlands might be modified to enhance their storm water runoff quality treatment function to benefit downstream water bodies or watercourses. That analysis may result in the revision of some of the wetland rankings developed in this plan.

7.30 Comprehensive Surface Water Management Plan

As indicated in Sections 7.10 and 7.20, the City's comprehensive surface water management plan and the wetland protection and management plan will work together to provide management guidance for all of the City's water resources. The wetland protection and management plan will be included in the comprehensive surface water management plan by reference.



8.0 Plan Amendments

This plan extends for five years following the year in which it is approved and adopted. The plan shall remain in effect pending approval and adoption of a succeeding plan. Plan amendment procedure will follow the Minnesota Rules Chapter 8420, part 8420.0650, subp. 5, “Amendments to the plan become effective upon completion of the same process required for the original plan.”



Glossary

2,4 - D	A herbicide containing 2,4 Dichlorophenoxy - acetic acid.
Action Category Definitions	There are three action categories based on the recommended type of action to be taken for a wetland. Category “A” wetlands are recommended for capital improvements, category “B” wetlands are recommended for best management practices, and category “C” wetlands are recommended for preservation.
Algaecide	A chemical agent that destroys algae in water.
Aquatic Macrophyte	Macroscopic plants in a water environment.
Aquifer	A saturated permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients.
Best Management Practice (BMP)	A practice or combination of practices that are determined to be the most effective and practical (including technological, economic, and institutional considerations) means of controlling point and nonpoint pollutant levels compatible with environmental quality goals.
Biological Oxygen Demand	The amount of oxygen utilized when the organic matter in a given volume of water is degraded biologically.
Bounce	The increase in water surface elevation of a water body that occurs as a result of a storm water or snowmelt runoff event.
Buckthorn	A small exotic tree/shrub introduced into the United States in the early 1900’s as an ornamental planting and for creating dense hedgerows. Because buckthorn is a very adaptable plant, it often invades woodland and wetland areas, reducing the diversity and integrity of natural areas.
Capital Improvement	A repair or improvement project which is budgeted and paid for with City funds.
Copper Sulfate	Chemical used to control algae in impounded waters, lakes and ponds. Usually kills most vegetation within 3 to 5 days.
Detention Basin	A natural or manmade basin that temporarily stores storm water runoff to control peak discharge rates.



Diquat	A chemical used to control submergent vegetation and duckweed.
Direct Contact Lake	A water body used for recreation such as swimming, water-skiing, diving, etc.
Dissolved Oxygen	The amount of soluble oxygen in a given volume of water.
Drain	Any method for removing or diverting waters from wetlands. The methods include, but are not limited to, excavation of an open ditch, installation of subsurface drainage tile, filling, diking, or pumping.
Drainage Area	An approximate boundary which storm water runoff does not cross based on topography and storm sewer structures. Storm water within this area usually either exits at one outlet point or flows to one water body within the drainage area. Bloomington has 22 drainage areas.
Easement	The right which the public or an individual has in the lands of another. An easement does not give the grantee a right to the land - only a right to use the land for a specified purpose. The owner of the land may also use it for any purpose that does not interfere with the specified use by the grantee.
Endothal Salts	Active ingredients found in some aquatic herbicides.
Enzyme	A protein that can initiate or accelerate specific chemical reactions in the metabolism of plants and animals.
Erosion	Wearing away of the lands or structures by running water, glaciers, wind, and waves
Eurasian Watermilfoil	An exotic submerged aquatic plant that often forms dense surface mats, which shade native plants and interfere with water recreation.
Eutrophication	The process by which a body of water becomes highly productive either naturally or by pollution rich in dissolved nutrients (such as phosphates). Eutrophic lakes are often shallow, with a seasonal deficiency in dissolved oxygen.
Excavation	The displacement or removal of the sediment or other materials by any method.
Fertilizers	Liquid or solid products containing nitrogen, phosphorus and potassium that enhance the growth and development of plants.
Fill	Any solid material added to, or re-deposited in, a wetland that would alter its cross-section or hydrological characteristics, obstruct flow patterns, change the wetland boundary, or convert the wetland to a non-wetland.



Floodplain	The areas adjoining a watercourse or a water body that are covered by flood water for a given storm water or snowmelt runoff event.
Floodplain Wetland	A wetland located in the floodplain of a watercourse, with no well defined inlets or outlets, including tile systems, ditches, or natural water courses. This may include the floodplain itself when it exhibits wetland characteristics.
Forebay	An area located immediately adjacent to, or in a shallow portion of, a wetland that traps sediment and debris.
Fritz-zyme 360	The trade name of an enzyme based algaecide.
Geology	The science of the origin, history, and structure of the earth, as recorded in the rocks; together with the forces and processes now operating to modify rocks.
Glacial Drift	Poorly sorted sediment that was deposited by glaciers.
Glyphosate Salts	Active ingredients in certain aquatic herbicides.
Herbicides	An agent used to destroy or inhibit plant life, includes algaecides
Heterotrophic Bacteria	Bacteria that obtain nourishment chiefly or entirely from complex organic substances.
Hydric soils	Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.
Hydrologic	The applied science concerned with the waters of the earth in all their states - - their occurrences, distribution, and circulation through the unending hydrologic cycle of precipitation; consequent runoff, stream flow, infiltration, and storage; eventual evaporation; and precipitation.
Hydrophytic vegetation	Macrophytic plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.
Impacted Wetland	A wetland that has been drained or filled, partially or wholly, and is subject to replacement.
Indirect Contact Lakes	A water body used for recreation such as boating, fishing, or commercial uses.



Infiltration	The entrance of water into the soil or other porous material through the interstices or pores of a soil or other porous medium.
Invasive-Exotic Species	Plant and animal species non-native to North America, which in the absence of natural predators and controls, often out-compete native species. These species can reduce the diversity and integrity of biological systems.
Isolated Wetland	A wetland that is not connected to other water bodies via watercourse or storm sewer.
Manmade Pond	A water body created for water storage, water quality, or aesthetics; may or may not have properties of a natural wetland.
Monotypic Vegetation	A vegetative community containing only one type, e.g. a genus or plant community consisting of a single species.
Nitrates	Salts and esters of nitric acid.
No Net Loss	No reduction in the area and value of a wetland from existing conditions.
Non-point Source Pollution	Pollution originating at a variety of non-localized sources, such as street runoff, septic systems, atmospheric deposition, or groundwater.
OHWL	Ordinary High Water Level - The boundary of public waters, which is the elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape; commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHWL is the elevation of the top of the channel bank. The OHWL is set by the Minnesota Department of Natural Resources (MDNR).
Ordinance	A law of a municipal body.
Percent Impervious	Estimated percent of impervious surface within a drainage basin based on land use.
Pesticides	Compounds used to destroy insect pests. In a broader usage, pesticides is a term commonly used to describe fungicides, insecticides, rodenticides, algacides, and herbicides.
Phosphorus	A highly reactive element. Concentrations of phosphorus in water can affect water quality and algae growth.
Policies	A written course or plan of action designed to influence future decisions.



Prairie Pothole	Shallow, marshy wetlands found particularly in the Dakotas and central Canadian provinces.
Precipitation	The total measurable supply of water from all forms of falling moisture, including dew, rain, mist, snow, hail, and sleet; usually expressed as depth of liquid water on a horizontal surface in a day, month, or year; and designated as daily, monthly, or annual precipitation.
Preserve or Preservation	A wetland management category. Wetlands in this category offer a unique functional value or characteristic that the City wishes to retain. Steps will be taken to insure that the particular function or characteristic of the wetland is protected.
Programs	A prearranged or desired plan or course of action.
Purple Loosestrife	An exotic herbaceous perennial of Eurasian origin responsible for the degradation of many prime wetland habitats throughout the temperate regions of the United States and Canada. Large monotypic stands reduce the biotic diversity of wetland systems by replacing native plant species and thereby eliminating the natural foods and cover essential to many wetland wildlife inhabitants, including waterfowl.
Sedimentation Basin	An area located in the upland area adjacent to a wetland that traps and sediment and debris.
Shore Area	All land in the City lying within a defined distance from a given public water body, as measured from the Ordinary High Water Level (OHWL). The development, use, and alteration on the shore area is regulated by sections 19.87.01-19.87.08 of the City code. The affected water bodies, and the size of the shore area for each one, can be found in Table 1 of section 19.87.03 of the City code.
Shore Area Impact Zone	All land in the City lying within a defined distance from a given public water body, as measured from the Ordinary High Water Level (OHWL). The development, use, and alteration of the shore impact zone is regulated by sections 19.87.01-19.87.08 of the City code. The affected water bodies, and the size of the shore area for each one, can be found in Table 1 of section 19.87.03 of the City code. Land in the shore area impact zone (that half of the shore area closest to the public water) is more strictly regulated than that in the shore area.
Standard Plate Count	A standard method for counting total aerobic bacterial growth of cultures incubated for 48 hours at 32 degrees centigrade in a petri dish containing standard plate agar.
Succession	The process of plants adapting to and modifying the abiotic components, and in doing so, establishing increasingly complex systems with the more complex stage gradually replacing its less complex predecessor.
Surfactant	A surface active substance. As an additive to herbicide formulations, surfactants improve the surface adhesion of the herbicide to the target plant surface.



Suspended Solids	The non-soluble compounds, materials and matter in a given volume of water.
Trap Manhole	A manhole designed to capture sediment carried by storm water runoff, as well as other pollutants like oil and debris.
Vegetative Buffer Zone	An upland area adjacent to a wetland that is covered with natural vegetation.
Water Body	An area of standing water such as a pond, wetland or lake.
Watercourse	Flowing water such as a creek, stream or river.
Watershed	The surface drainage area that contributes water to a water body or watercourse.
Watershed Management Organization	A watershed district wholly within the metropolitan area, or a joint powers entity established wholly or partly within the metropolitan area by special law or by agreement, that performs some or all of the functions of a watershed district for a watershed and that has the characteristics and the authority specified under Minnesota Statutes, section 103B.211. Lake improvement or conservation districts are not watershed management organizations.
Wellhead Protection	The process of mitigating the potential for contamination of a well or well field by instituting controls on land use in the area where the well receives its groundwater.
Wet Meadow	Wetlands dominated by herbaceous vegetation (frequently sedges of the genus <i>Carex</i>) and with waterlogged soil near the surface but without standing water for most of the year.
Wet Prairie	A herbaceous wetland dominated by grasses rather than sedges and with waterlogged soil near the surface but without standing water for most of the year.
Wetlands	Transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow areas. Wetlands must: have a predominance of hydric soils; be inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and under normal circumstances, support a prevalence of hydrophytic vegetation.
Wetland Banking	A system of identifying wetlands restored or created for replacement credit, providing for, and facilitating and tracking, the exchange of wetland banking credits for projects that require replacement plans.



Wetland Classification	Two commonly used methods for classifying wetlands have been developed. Circular 39 definitions, developed by the USF&WS in 1956, classify wetlands by “type 1, type 2, etc.”. National Wetland Inventory (NWI) definitions, developed by Cowardin for the USF&WS in 1979, classify wetlands using a tier system. More detailed Circular 39 and NWI descriptions can be found in Appendix D.
Wetland Creation	Construction of a wetland in an area that was not a wetland in the past.
Wetland Mitigation	The practice of allowing unavoidable losses of wetland in exchange for their replacement elsewhere through restoration or creation of new wetlands.
Wetland Restoration	Re-establishment of an area that was historically wetland but currently provides no or minimal wetland functions due to manmade alteration such as filling or drainage.
Wetland Type	A wetland classified according to Wetlands of the United States, USF&WS. Refer to the Circular 39 and NWI wetland types found in Appendix D for a more detailed description.
Yellow Lotus	A floating, leafed plant which contains a distinct yellow flower. It is a protected wildflower in Minnesota. No removal is allowed.



Abbreviations and Acronyms

BMP	Best Management Practice
BWSR	Board of Water and Soil Resources
HCD	Hennepin Conservation District
LGU	Local Government Unit
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
Mn/DOT	Minnesota Department of Transportation
MNRAM	Minnesota Routine Assessment Method for Evaluating Wetland Functions
NPDES	National Pollutant Discharge Elimination System Program
NWI	National Wetland Inventory (Cowardin)
USC	United States Code
USCOE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
USF&WS	United States Fish and Wildlife Service
WCA	Wetland Conservation Act



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