



Wetland Protection and Management Plan



Amended November 2017



City of Burnsville, Minnesota

Executive Summary

The City of Burnsville (City) covers approximately 17,282 acres, of which approximately 2,785 acres, or 16 percent, are wetlands or other water features. These surface water resources include six lakes, 266 wetlands, 59 storm water or other created ponds, and portions of three designated trout streams that are located wholly or partially within the City. Wetlands alone constitute 1,824 acres, or about 11% of the city area. One of the most prominent features in the City is the Minnesota River and the extensive backwater and wetlands associated with it. The Minnesota River associated wetlands and Black Dog fen within the Minnesota Valley National Wildlife Refuge account for 913 acres, or about half of the wetland habitat within the city limits.

The City of Burnsville is located at the northern boundary of Dakota County (Figure 1). The City includes portions of four watersheds; the Black Dog, Lower Minnesota River, Vermillion River, and Credit River (Figure 2). These watersheds are managed by several watershed organizations, of which the City is an active member. This Plan has been drafted to comply or exceed the requirements of these organizations.

This Wetland Protection and Management Plan has been developed to provide the City with an updated wetland inventory and functions and values analysis, to provide enhanced management strategies to preserve and protect the wetland resources, and to comply with local watershed organizations plans. The regulatory framework developed in this Plan will be incorporated into the City's existing planning and zoning regulations and implemented by ordinance. This Plan is an update to the original Plan completed in 1998.

Wetlands within the City have been classified into four categories to provide a range of protection standards. These categories are Protection, Improvement, Management, and Management II. The first three categories are unchanged from the 1998 inventory and Plan. The exception to this is the automatic classification of any Outstanding Resource Waters as Protection. The validity of the 1998 classification system was tested using the Minnesota Routine Assessment Method Version 3.0 (MnRAM) to see if the older classes continue to accurately represent the wetland functions and values. Comparison of a subsample of the of the 1998 inventory to the MnRAM-derived classifications demonstrated that the older inventory was equal or more conservative than the more current methods, and was therefore still acceptable. A new category, Management II, has been added to the updated Plan to provide a category for wetlands currently being used for storm water management purposes, but would be regulated as a wetland.

This Plan update includes:

- Updated inventory of the wetlands in the City; including accurate mapping, functions and values analysis, and classification;
- Differentiation of regulated wetlands from other water features;
- Development of regulatory and non-regulatory options for wetland preservation and protection;
- Identification of potential wetland mitigation sites within the city;
- Refinement of a GIS-based wetland management system.

Purpose of the Plan

The purpose of this Plan is to establish a comprehensive wetland protection and management program to protect, conserve, and manage the wetlands within the City. The Plan also recognizes that development and redevelopment will continue well into the future, and will serve as a guide for City staff and developers to follow as they evaluate the potential impacts of a given project. The Plan will serve as the toolbox for the City, and includes the best available mapping of the wetlands and water resources, differentiation of wetlands from other water features, and development of regulatory policies and goals. This Plan is also intended to

meet or exceed the requirement of the watershed management organizations within the city, and allow the City to continue managing its wetland resources in accordance with the Plan.

Basis for the Plan

This Plan has been prepared following the requirements of Minnesota Rule Chapter 8420.0650, Local Comprehensive Wetland Protection and Management Plans. These statutes and rules allow for the City to regulate wetland policy, provided that minimum standards are met. The planning process must include the following:

- Provide for resource agency and public participation;
- Wetland functional assessment information for the plan area;
- High priority area identification;
- Meet no-net loss of wetlands within the plan area;
- Follow Wetland Conservation Act requirements; and
- Adopt a local ordinance that implements the plan.

This Plan has also been prepared with the requirement that it comply with the standards of the local watershed management organization plans. The City is located within four major watershed units as shown in Figure 2. These watersheds are regulated by three organizations including: Black Dog Watershed Management Organization (BDWMO), Lower Minnesota River Watershed District (LMRWD), and Vermillion River Joint Powers Organization. The fourth watershed, Credit River, is administered by the BDWMO for the portion of the watershed within Dakota County.

Goals and Objectives

The main objective for the updated Wetland Protection and Management Plan is to provide a current inventory of the wetland resources in the City, differentiate regulated wetlands from other water features, and develop a comprehensive approach to regulate and protect wetlands based on wetland functions and associated public values.

This Plan includes an update of the results of a complete field inventory of the City along with an assessment of the quality of the wetland resources completed in 1998. It is intended to provide a guide for City staff and residents to make informed decisions about the future development and redevelopment of the City with respect to the protection, conservation, and management of wetland resources.

Wetland Inventory Database

The 1998 wetland inventory was reviewed and updated using recent high-resolution aerial photographs. The previous inventory used field-based attributes, but the boundaries were based on the National Wetlands Inventory (NWI) (Figure 4). The NWI is a good reference, but is not accurate enough to substitute for a current wetland inventory. This revised database replaces the former inventory. Review and updating of the 1998 inventory was needed as many of the former basins were not mapped correctly, mapped basins were not present, and some wetlands may have been missed. The results of the 2006 inventory are shown in Figure 5, which includes the management classification for each wetland. The official inventory will reside within the City's GIS database.

Classification of Wetland Basins

Each basin within the city has been classified into one of four categories. These categories are the basis for which protection standards have been established. The 1998 inventory attributed classifications based on the

Natural Resource Evaluation, supplemented with data from the City's 1994 Storm Water Management Plan, the Dakota County Biological Survey and other sources.

The database and supplemental information were used to determine the classification of each wetland basin by sorting the data according to total points and applying the ranking strategy. The resulting classifications include the following:

- *Protection Areas* - Basins with Native Grades of A or B, sites with complete Community Structure, any sites supporting rare species, and any sites within or adjacent to significant natural communities as identified by the Dakota County Biological Survey. This is comparable to the Preserve Classification used in the MnRAM.
- *Improvement Areas* - Basins with 3 of 4 of the Community Structure criteria, sites greater than ten acres in size, Minnesota Department of Natural Resources Protected Waters and Wetlands (Public Waters), and basins within existing City parks that are not classified as Protection Areas. Although there is some overlap, this classification is similar to the Manage I and Manage II MnRAM classifications.
- *Management Areas* - Remaining wetlands, but generally of low quality and located outside of protected areas. Management wetlands are also likely to receive untreated storm water runoff, but have not been altered to enhance treatment capabilities. This classification is comparable to the Manage II and Manage III MnRAM classifications.
- *Management II Areas* – These basins include any of the water features that may have been historic wetlands, and would remain subject to the requirement of the Wetland Conservation Act. These basins will have minimal protection standards as they currently function primarily to provide storm water management.

A detailed description of the classifications and ranking strategy is included in the Wetland Inventory and Classification section of this report.

In 2006, the older classification system was reviewed to determine if the wetland designations were still accurate and comparable to more recent assessment methods. To accomplish this, random samples of ten wetlands from each of the management classes were selected for review using the Minnesota Routine Assessment Method Version 3.0 (MnRAM). This provided a total of 30 basins to be assessed and compared to the older classifications. A detailed discussion of the comparison is included in Section III, however it has been determined that the existing classification system remains adequate or even more protective than the comparable MnRAM classification.

Wetland Restoration Areas

In addition to identifying the current wetlands, the plan update has identified areas of potential wetland restoration. This has been completed by comparing the updated inventory, mapped hydric soils, the National Wetlands Inventory, current land use, and recent and historic aerial photographs to identify areas that have the potential to either be restored or created wetland. Several areas, mainly along the northern 1/3 of the City, have been identified. These areas have been shown in Figure 5.

Major Changes from 1998 Plan

While much of this plan is a general update to the 1998 plan, there are some areas of significant change that should be identified. Although described in greater detail in the main document, the following are major changes of note:

1. The wetland inventory has been refined to separate wetlands from other water features. This includes a removal of lakes and created ponds from the wetland inventory. The result of this is that a direct comparison of wetland areas from 1998 to 2006 would reflect a significant decline. This is not accurate,

however, as lakes and ponds have been categorized as non-wetland features. In reality, the amount of wetland is unchanged.

2. Storm water ponds that were created since 1998 and are in upland soils have been excluded from the wetland inventory, but have been included as a separate GIS coverage and discussed in the Surface Water Management Plan.
3. Storm water ponds that may still be WCA regulated have been classified as a new management classification called Management II. This allows them to remain in the inventory as wetlands, but have appropriate management strategies applied to them.
4. The buffer requirements have been changed from a standard setback of 20 feet for all wetlands to a setback of 20 feet for Management II, 25 feet for Management, 35 feet for Improvement, and 50 feet for Protection.
5. Storm water pretreatment requirements have been improved to require removal of 90% of total suspended solids (TSS) and 60% of total phosphorus (TP) for areas of new development, and 70% of TSS and 30% TP removal for areas of redevelopment. Infiltration requirements have also been established. All of these are regulated in accordance with the updated Surface Water Management Plan.
6. Hydrologic guidelines have been changed to be more specific for the wetland management classes. Protection wetlands will require that excess hydrology be diverted if it is isolated or does not currently receive storm water. If a Protection basin is not isolated, or currently receives untreated discharge, then the bounce on a 10-year event must be less than 6 inches, and must not exceed existing inundation by more than 1 day for 1 and 2 year events and 3 days on a 10 year event. Improvement basins allow for a bounce on a 10-year event of 9 inches, and inundation duration to be existing plus 3 days for 1 and 2 year events, and 5 days for 10-year events. Management basins allow for a bounce on a 10-year event of 12 inches, and inundation to be existing plus 5 days for 1 and 2-year events and 15 days for a 10-year event. Outlet controls standards have also been established to limit water level manipulations.

November 2017 Amendments

Section 4.2.1 was added to the plan to incorporate the Minnesota State Buffer Law. In addition, Figure 5 was revised with updated stormwater management features.

Acknowledgements

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Vermillion River Joint Powers Organization
Lower Minnesota River Watershed District
Board of Water and Soil Resources
Minnesota Pollution Control Agency
Minnesota Department of Natural Resources
U.S. Army Corps of Engineers
Dakota County Soil and Water Conservation District
Minnesota Valley National Wildlife Refuge

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Wetland Protection and Management Plan

1.0 Introduction

The City of Burnsville (City) is located in the northern portion of Dakota County as shown in Figure 1. The City is bordered to the north by the Minnesota River, which forms a boundary between the Cities of Burnsville and Bloomington. To the east lie the Cities of Eagan and Apple Valley, to the south is the City of Lakeville. The western portion of the City lies along the Dakota and Scott County line and the City of Savage. A very small portion of the southwest side of the city is also adjacent to Credit River Township. The city is located within four watersheds, including the Black Dog, Lower Minnesota, Vermillion River, and Credit River. The locations of these watershed organizations are identified in Figure 2.

The City has completed this updated Wetland Protection and Management Plan (WPMP, the Plan) to improve the accuracy of the previous wetland inventory, review the existing classification system compared to current assessment methods, differentiate wetlands from unregulated water features, and establish a more useful and up-to-date resource to guide future planning. This Plan builds on the City's 1998 Plan, and addresses some of the deficiencies present in the previous Plan, while presenting contemporary methodologies and policies.

This introductory section begins with a brief description of the purpose and basis for this updated Plan, followed by an outline of the major sections of goals that were used to guide development of the Plan.

1.1 Purpose of the Plan

The purpose of this Plan is to establish a wetland protection and management program that protects, conserves, and manages the quality of the wetlands within the City. The Plan also recognizes that development and redevelopment will continue well into the future, and will serve as a guide for city staff and developers to follow as they evaluate the potential impacts of a proposed project. The Plan will serve as a toolbox for the City that includes the best available mapping of the wetlands and water resources, differentiation of wetlands from other water features, and development of regulatory policies and goals.

1.2 Basis for the Plan

This plan has been prepared following the requirements of Minnesota Rule Chapter 8420.0650, Local Comprehensive Wetland Protection and Management Plans. This Plan formally serves as an alternative to the rules adopted under Minnesota Statutes, section 103G.2242. However, before this occurs, the Plan would need to be approved by the Board of Water and Soil resources (BWSR), be adopted by the City, and must require equal or greater standards and procedures as compared to the Wetland Conservation Act (WCA). This is the intention of this Plan.

The benefits of a WPMP include a current functions and values assessment for management and wetland ordinance development, greater flexibility in sequencing and replacement standards for wetlands, and improvement and management of higher quality wetlands within the City. The planning process must include the following:

- Provide for resource agency and public participation;
- Wetland functional assessment information for the plan area;

- High priority area identification;
- Meet no-net loss of wetlands within the plan area;
- Follow Wetland Conservation Act requirements; and
- A local ordinance that implements the plan.

This Plan has also been prepared with the requirement that it comply with the standards of the local watershed management organization plans. The City is located within four major watershed units as shown in Figure 2. These watersheds are regulated by three organizations, including: Black Dog Watershed Management Organization (BDWMO), Lower Minnesota River Watershed District (LMRWD), and Vermillion River Joint Powers Organization. The fourth watershed, Credit River, is administered by the BDWMO within Dakota County. All three of the organizations have jurisdictional authority within the City, and therefore each must review the City's Plan to evaluate consistency with their respective WMO Plan.

1.3 Goals and Objectives

The main objective for the updated Plan is to provide a current inventory of the wetland resources in the City, differentiate regulated wetlands from other water features, and develop a comprehensive approach to regulate and protect wetlands based on wetland functions and associated public values.

This Plan includes an update of the results of a complete field inventory of the City along with an assessment of the quality of the wetland resources completed in 1998. It is intended to provide a guide for City staff and residents to make informed decisions about the future development and redevelopment of the City with respect to the conservation, protection, and management of wetland resources.

This Plan has been developed to provide the City of Burnsville with an updated comprehensive inventory of the existing wetland resources in the community and establish management strategies for wetland preservation and protection. This plan will be implemented by City staff through the City's adoption of an amended wetland ordinance.

The 1998 Plan and wetland inventory was initiated by the City under the Minnesota Board of Water and Soil Resources 1997 Challenge Grant Program which provided financial support for the project. It also fulfilled the goal of the City's Storm Water Management Plan to develop a wetland management plan.

This plan update includes:

- Updated inventory of the wetlands in the City; including accurate mapping, functions and values analysis, and classification;
- Differentiation of wetlands and other water features;
- Development of regulatory and non regulatory options for wetland preservation and protection;
- Identification of wetland mitigation sites within the city;
- Refinement of a GIS based wetland management system.

The Plan will be the basis for wetland regulation in the City of Burnsville and the implementation of the WCA. The regulatory framework developed in this Plan will be incorporated into the City's existing planning and zoning regulations and implemented by ordinance.

1.4 Plan Overview

The Plan seeks to provide appropriate protection to the City's wetland resources. To accomplish this, a series of goals and goal statements have been generated (Table 1). These goals will be accomplished through the updating of the wetland inventory, refinement of the wetland functions and values, identification of a wetland classification system, and establishment of regulatory criteria to protect the resources.

Table 1 Plan Goals and Goal Statements		
Goal Number	Goal	Goal Statement
1	Wetland Inventory	Map and characterize the existing wetlands within the city
2	Define Wetlands	Differentiate regulated wetlands from other unregulated or non-jurisdictional water features
3	Develop Policy	Update and refine policies to incorporate current standards
4	Wetland Mitigation	Map and identify wetland mitigation sites
5	Refine GIS	Develop GIS process to maintain active wetland tracking

1.5 City of Burnsville Outcomes

It is a priority of the City of Burnsville to maintain and improve the quality of the natural resources in the community. To that end, the City has adopted an end statement and a set of outcomes that reflect the overall philosophy or approach to wetland protection and management. This Plan has been developed with the intention of supporting the community's efforts to achieve those end goals and the related outcomes.

City of Burnsville's Environmental End Statement and Related Outcomes

Environmental End Statement:

People find Burnsville is an environmentally sensitive community ensuring preservation and enhancement of its natural resources

Related Outcomes:

- People find that Burnsville is an environmentally sensitive community and they understand their role in pursuing these results.
- Development and redevelopment occur in an environmentally sensitive manner, preserving our natural resources.
- Citizens value natural water bodies and recognize the importance of preserving them.

1.6 Review Process

The review process was designed to involve as many of the wetland resource stakeholders as possible. The Plan has been initially reviewed by City staff to determine the adequacy and applicability of the recommendations, goals, and policies. Based on preliminary City staff review, the Plan was submitted to the Parks and Natural Resource Committee for additional internal review.

Once the internal review was complete, an Agency Review Draft of the Plan was prepared and submitted to the agencies and organizations that have jurisdiction in the City of Burnsville for their review and comment. In addition, the Plan was made available for public review during this period, including a formal Public Hearing process. Once this review process was complete, and comments and revisions were made, and the Plan was finalized, submitted to the BWSR Board for approval, and adopted and implemented by the City Council.

2.0 Background Information

The City of Burnsville covers approximately 17,282 acres, of which approximately 2,785 acres, or 16 percent, are a wetland or water features. These surface water resources include six lakes (as identified in the City's Lakes Ordinance, except for Wood Pond and Twin Lake, which are included in both), 266 wetlands, 59 storm water ponds, and portions of three designated trout streams that are located wholly or partially within the City. Wetlands alone constitute 1,824 acres, or about 11% of the city area. One of the most prominent features in the City is the Minnesota River and the extensive backwater and wetlands associated with it. The Minnesota River associated wetlands and Black Dog fen within the Minnesota Valley National Wildlife Refuge account for 913 acres, or just over half of the wetland resources within the city limits.

Within the city limits are four primary watersheds and three watershed management organizations (Figure 2). The majority of the City is within the Black Dog WMO, which also regulates the portion of the City within the Credit River watershed. The Black Dog WMO regulates about 66% of the City. The Lower Minnesota River Watershed District covers approximately 27% of the City, which includes the entire northern portion of the City. This watershed includes the Minnesota Valley National Wildlife Refuge, Black Dog Fen Scientific and Natural Area, and the City's only trout streams. The Credit River watershed is located in the southwest portion of the city and drains west into Scott County. The most notable wetlands in the watershed are located in the Kelleher Park. The final watershed in the City is the Vermillion River, which is represented in approximately 6% of the City and includes the Lake Alimagnet area. The Vermillion River watershed is distinct in that it drains to the Mississippi River, not the Minnesota, and represents a divide in major watersheds.

2.1 Wetlands

Wetlands are defined in the Federal Register as:

“Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.”

Wetlands are characterized by unique vegetative communities that are adapted to anaerobic conditions that result when soils are saturated for extended periods of time. Saturated soils also develop unique physical and chemical characteristics that distinguish them from other upland soils.

2.2 Wetland Classification

Wetlands are primarily classified using dominant hydrology and vegetation characteristics. While there are several classification systems available, there are several that are used most frequently. These classifications systems are described in the following pages.

2.2.1 Circular 39

The classification method developed for the initial state wetland protection program is entitled Wetlands of the United States. It was published by the U.S. Fish and Wildlife Service as Circular 39 in 1956 and republished in 1971. The system was utilized in the Protected Waters Inventory legislation of 1976 and 1979 and in the 1996 amendments to the Wetland Conservation Act. The Circular 39 classification method describes 20 types of wetland basins, eight of which are found in Minnesota. The system classifies wetland basins primarily on the basis of vegetation and depth and seasonality of water. The eight types of inland fresh wetlands are listed below.

Type 1 Seasonally Flooded Basins or Floodplains: Type 1 wetlands are seasonally flooded basins or flats in which soil is covered with water or is waterlogged during variable seasonal periods but

usually is well-drained during much of the growing season. Type 1 wetlands are located in depressions and in overflow bottom lands along water courses. Vegetation varies greatly according to the season and duration of the flooding, and includes bottom land hardwoods, as well as herbaceous plants.

Type 2 Wet Meadow: Occurs along the shallow edges of lakes, marshes and floodplains, or in perched depressions. The soil is usually without standing water during much of the growing season, but is waterlogged within at least a few inches of the surface. Vegetation includes grasses, sedges, rushes and various herbaceous plants.

Type 3 Shallow Marsh: Soil is usually water logged during the growing season, often covered with as much as six inches or more of water. Vegetation includes grasses, bulrushes, cattails, arrowheads, smartweeds and other emergent aquatic vegetation.

Type 4 Deep Marsh: Soil covered with six inches to three feet or more of water during growing season. Vegetation includes cattails, reeds, bulrushes and wild rice. Open water areas may contain pondweeds, naiads, coontail, water milfoils and other submergent aquatic vegetation.

Type 5 Open Water: Water is usually less than six feet deep and is fringed by a border of emergent vegetation. Vegetation includes pondweeds, naiads, coontail, water milfoils and other submergent aquatic vegetation.

Type 6 Scrub shrub: Occurs along sluggish streams or on floodplains. The soil is usually waterlogged during the growing season, and is often covered with as much as six inches of water. Vegetation includes alder, willow, and dogwood.

Type 7 Wooded Swamp: Occurs along sluggish streams, on floodplains, on flat perched depressions and in shallow lake basins. The soil is waterlogged to within a few inches of its surface during the growing season and is often covered with as much as one foot of water. Vegetation typical to this wetland includes tamarack, white cedar, black spruce, balsam fir, red maple and black ash.

Type 8 Bog: Occurs along sluggish streams, on flat perched depressions and shallow lake basins. The soil is waterlogged and supports a spongy covering of mosses. Vegetation typical to this wetland type includes sphagnum moss, heath shrubs and sedges. Minnesota bogs contain leatherleaf, Labrador tea, cranberries and pitcher plants. Scattered stunted black spruce and tamarack also are common features of bogs.

2.2.2 Cowardin

A second type of wetland classification system that is often used is the Cowardin system. This classification system is used by the National Wetlands Inventory (NWI) and is based on a tiered system. This system identifies a wetland based on hydrology and vegetation composition, plus any special modifiers. The hierarchical structure progresses from Systems and Subsystems at the most general levels to Classes, Subclasses, and Dominance Types at the most specific levels.

2.2.3 Eggers and Reed

A third classification system has recently been adopted for use in determining wetlands for the purposes of identifying in-kind wetland replacement. The Eggers and Reed (1997) system recognizes 12 wetland types, rather than the eight recognized by Circular 39. The advantage of Eggers and Reed is that it expands the Circular 39 classification to be more specific to some of the vegetative and ecological variability of wetlands. The 12 wetland classifications are identified below.

Shallow Open Water: Submergent aquatic systems or shallow open water, usually less than 6.6 feet in depth. Vegetation dominated by submergent and floating leaved species. Equivalent to Type 5

Deep Marsh: Emergent and submergent aquatic communities in water depths ranging from 6 inches to 3 or more feet. Vegetation composed of bulrushes, water lily, and duckweed. Equivalent to Type 4.

Shallow Marsh: Emergent aquatic community with hydrology ranging from saturated to 6 inches. Vegetation composed of emergent species such as cattails, arrowheads, and sedges. Equivalent to Type 3

Sedge Meadow: Inland fresh meadow dominated by sedge species. Soils are typically peat or muck. Equivalent to Type 2.

Fresh (Wet) Meadow: Inland fresh meadow dominated by grasses and forbs in roughly equal numbers. Equivalent to Type 1 and Type 2.

Wet to Wet-Mesic Prairies: Inland fresh meadow dominated by an open herbaceous plant community dominated by native grasses. Equivalent to Type 1 and Type 2.

Calcareous Fen: Unique plant communities supported by groundwater inflow rich in carbonates. Plants are dominated by calciphiles. Equivalent to a Type 2 or a Type 6.

Open Bog or Coniferous Bog: Unique communities growing on saturated and acid peat soils. Open bogs are dominated by sphagnum mosses and shrubs, while coniferous bogs are dominated by black spruce and tamarack trees. Equivalent to Type 8.

Shrub-Carr or Alder Thicket: Plant community composed of tall deciduous shrubs growing on saturated or seasonally flooded soils. Plants may be willows, dogwoods, or alder. Equivalent to Type 6

Hardwood Swamp or Coniferous Swamp: Wetlands dominated by tree species and having soils saturated for much of the growing season and short-term inundation as much as 1-foot. Equivalent to Type 7

Floodplain Forest: Wetlands dominated by deciduous hardwood trees growing on alluvial soils associated with riverine systems. Soils are inundated during flood events, but are well-drained during much of the growing season. Equivalent to Type 1.

Seasonally Flooded basins: Poorly drained shallow depressions that may have short-term inundation, but are dry for majority of the year. Often composed of exposed mud flats or pioneering vegetation. Equivalent to Type 1.

2.2.4 Natural Heritage Program

A third classification system that is used is based on the classifications used by the Natural Heritage Program (NHP) at the Minnesota Department of Natural Resources. This program has developed the Minnesota's Native Vegetation: A Key to Natural Communities to classify wetland as well as other natural communities. The key was designed as a tool for recognizing and preserving important natural communities in Minnesota. The NHP provided much of the basis for the development of the 1998 Plan.

2.3 Functions and Values

Wetland functions are defined as natural processes that occur in wetlands. Wetland functions vary according to the type of wetland, the season of the year, location within the watershed, and surrounding land uses. Individual wetlands can provide one or many functions. Wetland values are typically subjective benefits that are realized to society through the natural processes that occur to a different extent in various wetland types. The SEH Natural Resource Evaluation was used to evaluate wetland functions and values in the 1998 Plan. The method allows for direct comparison of wetland and terrestrial resources while addressing the functions and values included in Minnesota Statutes 103B.3355 (Wetland Functions for Determining Public Values). The Minnesota Routine Assessment Method for Evaluating Wetland Functions (MNRAM) was developed by the Minnesota Interagency Wetland Group as a field evaluation tool to assess wetland functions on a qualitative basis.

The method used in the 1998 Plan provided an assessment of the wetland functions and values listed below. The list is limited to the functions and uses typical of the urban nature of the study area.

Wetland Functions

- A. Floral Diversity & Integrity
- B. Wildlife Habitat
- C. Fisheries Habitat
- D. Flood & Storm Water Attenuation
- E. Water Quality Protection
- F. Shoreline Protection
- G. Groundwater Recharge and Discharge
- H. Aesthetic/Recreation/Education & Science

Wetland values can be associated with one or more wetland functions. Those functions typically associated with individual value are indicated by the letter(s) following each of the listed wetland values. Wetland values can be subjective and different between individuals depending upon their perspective. The MnRAM has sought to standardize the determination of wetland values by eliminating some of the subjectivity.

Wetland Values

- A. Flood protection (D)
- B. Sediment control (E)
- C. Nutrient removal (E)
- D. Recreation (A, H)
- E. Open space (A, B, H)
- F. Aesthetics (A, H)
- G. Plant and animal refuges (A, B, C)
- H. Education and research (A, B, C, H)
- I. Erosion control (D, E, F)

- J. Historical and archeological resources (H)
- K. Threatened and endangered species habitat (A, B, C, H)
- L. Water quality (E)
- M. Water supply (G)

2.4 Land Use

The City of Burnsville is a nearly fully-developed community, but has had recent increases in interest of redevelopment. A majority of the land-use in the city is residential, although there are concentrations of commercial development, primarily in the northwest portion of the City and around Burnsville Center. The City has made a commitment to maintain open space and parks, and public areas are plentiful. Many of these public areas are dominated by wetland, including the vast expanse of the Minnesota Valley National Wildlife Refuge, but there are also significant upland and mixed land cover classifications in several major parks, including Sunset Pond Park, Lac Lavon Park, Alimagnet park, Terrace Oaks, Kraemer Preserve, and Murphy Hanrehan Park Reserve.

2.5 Unique Wetland Features

The City of Burnsville has numerous wetland resources, but has several that are worth noting for their unique or outstanding values.

The following paragraphs summarize some of the unique water and natural resource features within the City.

2.5.1 Minnesota Valley National Wildlife Refuge

The majority of the wetlands along the Minnesota River are included within the Minnesota Valley National Wildlife Refuge (MVNWR). The area lying between the railroad grade and the Minnesota River is part of the Black Dog Unit of the Refuge, and is under the authority of the U.S. Fish and Wildlife Service. The lands within the refuge are managed in accordance with the “National Wildlife Refuge and Wetland Management District Comprehensive Conservation Plan” completed by the U.S. Fish and Wildlife Service in 2004.

2.5.2 Black Dog Fen and Scientific and Natural Area

The Black Dog wetland complex is located within the Minnesota Valley National Wildlife Refuge south of Black Dog Lake and is a designated calcareous fen by Minnesota Rules (part 7050.0180, Outstanding Resource Waters). Fens are unique wetlands, in that they are hydrologically supported by upwelling of calcium-rich groundwater. Fens commonly harbor unique aquatic vegetation, and are often identified as critical wildlife habitat.

The Black Dog Scientific and Natural Area (BDSNA) is a designated protected area, which includes portions of the Black Dog fen. The BDSNA also includes areas of wet meadow and mesic prairie. The BDSNA is managed by the Minnesota Department of Natural Resources (MNDNR) and the Nature Conservancy.

2.5.3 Kelleher Park and Murphy Hanrehan Park Reserve

Located in the southwest portion of the city, the Kelleher (formerly Cam Ram) and Murphy Hanrehan Park Reserve areas have been designated as a high-priority site in the City’s Natural Resources Master Plan. The County Biological Survey also indicates that this area has critical habitat and contains state-listed plant species. The Kelleher wetland is also monitored through the Wetlands

Health Evaluation Program (WHEP). This area is relatively undeveloped, and has high quality uplands, and a high density of wetlands overall.

2.6 Lakes

The City of Burnsville is blessed with numerous lakes and other waterbodies. Most lakes are deeper than six feet, which is considered to be deep water habitat, and therefore do not meet the jurisdictional criteria of a wetland following the guidelines of the 1987 manual. This is typically true for lakes that are also identified as Public Waters by the MNDNR, for which administration of the WCA does not apply for areas below the Ordinary High Water (OHW) elevation. For this reason, the management of lakes is not included in this Plan. Many lakes, however, do have wetland fringe areas that may extend above the OHW, or have never had an OHW established. In these instances the WCA would still have jurisdiction for the wetland areas above the OHW. The removal of lakes from the wetland plan does not decrease the level of protection placed upon them as the city has identified goals and policies for the protection of lakes in the Water Resources Plan.

The 1998 Plan included lakes in the wetland inventory, which is also how they are identified on the NWI. The 2006 revision has removed seven lakes from the wetland inventory, which allows for a better representation of the actual wetland resources. The seven lakes removed from the wetland inventory include: Black Dog Lake, Alimagnet Lake, Crystal Lake, Earley Lake, Keller Lake, Lac Lavon, and Horseshoe Lake. These lakes are all identified and protected by the City's Lake Ordinance. Wood Park and Twin Lake are also identified in the Lake Overlay District, but are small and function more like a wetland than a lake. These two lakes are identified in both the wetland inventory and the Lake Overlay. Lac Lavon is a unique lake as it is not identified in the City's lake overlay district or the wetland inventory. Lac Lavon is a deep lake created from a former quarry and is not a wetland or natural water body. It is also not regulated by the MNDNR as a Public Water.

Several of the smaller lakes and ponds remain in the wetland inventory, notably Sunset Pond, as they have considerable wetland areas and tend to have large areas shallower than six feet. If lakes have extensive areas of emergent vegetation, that portion has been included within the inventory. Extensive emergent areas are not abundant, but mapping of them allows for both the inventory of all wetland areas, and for tracking changes in the extent of emergent vegetation on subsequent wetland inventory updates. It is important to note, however, that the wetland inventory did not use the OHW to establish wetland boundaries. The OHW is a jurisdictional, not ecological, boundary, and requires a site specific survey to identify.

2.7 Streams and Linear Waterways

While the City has abundant wetlands and lakes, it is relatively sparse in streams and other linear waterways. Linear features include ditches, grassed swales, and other areas designated for conveyance of surface waters.

The City does have designated trout streams in the northeast portion of the City. These include Unnamed Trout Stream Segment #7, One Mile Creek (also identified as Segment #4), and a very small portion draining into Harnack Creek (Segment #1). All of these drain into the Minnesota River through the Black Dog Lakes. These trout stream segments are several remnant trout streams identified by the DNR as part of its' Metro Trout Stream Watershed Protection Initiative.

The Minnesota River forms the northern boundary of the City, and is an important navigable waterway. This section of the river has extensive wetlands associated with it, many of which are of high quality and receive significant state and federal protection. The entire area east of Interstate 35W along the river is within the Minnesota Valley Wildlife Refuge. The river west of I-35W is primarily just the main channel, but has several docking facilities.

2.8 Storm Water Ponds

The 1998 wetland inventory used the NWI as a guide to identify the wetlands in the city, and as a result, several storm water treatments ponds were included. Most of these were well-defined basins, and are classified as Type 4 or Type 5 wetlands. If a pond was created in a non-wetland area without the intention of being wetland, it may not be regulated under the WCA, or may have less stringent requirements, such as not requiring wetland mitigation for impacts. The 1998 inventory did not make the distinction between storm water treatment ponds and natural wetlands and as a result, several treatment ponds were mapped and classified as wetlands. This is problematic as the designation of a basin as a wetland triggers buffer, bounce, and water quality pretreatment requirements before discharge. Most of these basins were classified as Management, which has the lowest protection standards; however this remains contrary to the intention of these basins. The removal of unregulated and non-jurisdictional water features from the inventory is one of the primary goals of the inventory and Plan revisions.

In 2006, a total of 94 basins used as storm water treatment ponds were mapped within the City. The total area of these features within the city was approximately 61 acres. Of the ponds mapped, 35 were included in the 1998 inventory, but were determined to currently function for storm water treatment. These 35 basins have been included in the inventory, but have been classified as a new management classification called Management II. The purpose of this additional classification is to allow for less stringent wetland management standards for areas currently functioning for storm water treatment. These basins, however, were likely to have been wetland prior to conversion for storm water treatment.

Historically, natural wetlands were used extensively for storm water treatment, either through restricting outflows or excavating wetlands to create additional open water areas and storage volume. While this practice has since been discouraged, many of the older storm water ponds were likely wetlands that have been converted. Inclusion of storm water ponds that are still regulated as wetland within the inventory allows these basins to be tracked and managed appropriately. Storm water ponds created out of upland areas and that were not wetland previously have been mapped and are discussed in the Surface Water Management Plan.

3.0 Wetland Inventory and Functions and Values Analysis

One of the requirements of a Comprehensive Wetland Protection and Management Plan (MWPMP) is to provide a wetland inventory and functions and values analysis. This was completed with the 1998 Plan, but has been reevaluated with the 2006 revision. This is necessitated as several issues have been detected through review of the 1998 inventory. One of the biggest needs was to differentiate wetlands from other water features. The 1998 plan includes many storm water treatment ponds, which may still be regulated under the WCA, but would not be subject to buffer, bounce, and water quality pretreatment standards. The 1998 inventory also included lakes, which would also not be regulated as wetlands, but would remain protected as Public Waters, and through the Surface Water Management Plan.

The primary goals of the updated wetland inventory are summarized in Table 2.

Table 2 Wetland Inventory Goals and Methods of Accomplishment		
Goal Number	Goal	Goal Statement
1	Improve accuracy of wetland inventory	Review 1998 mapping using recent high-resolution, rectified, aerial photographs. Edits include adjustment of boundaries, removal of basins no longer present, and additional of new features.
2	Differentiate wetlands from other water features	Review aerial photographs, 1998 Plan, and GIS storm water infrastructure coverages to determine which features are wetlands, from those that are other water features. Lakes, which are considered to be deep water habitat, would also be removed.
3	Prioritize wetland regulations based on functions and values	Evaluate the classifications used in the 1998 Plan to determine if they are still representative of the wetland functions and values. Compare 1998 outcomes to current function and value classification methodologies.
4	Identify the status and trends of wetlands from the 1998 inventory through the 2006 revision	Compare number and size of wetlands to determine if there are any detectable changes in wetland size, type, or quality since 1998 Plan approval.

3.1 Summary of 1998 Inventory

In 1998, the City completed a wetland inventory for the original CWPMP. The 1998 Plan was based on the National Wetland Inventory (NWI) map and the City's Storm Water Management Plan (SWMP), which were used as the initial base maps for the field inventory. Existing wetlands identified on the NWI and SWMP maps were visited during the field inventory.

Data for the function and value assessment were collected during a brief visit to each wetland basin or complex. The Natural Resource Site Survey Form was used to collect data at each location and the approximate location, size, and boundary was compared to the NWI map. The forms include a physical description of the basin, characterization of the plant community such as dominant species of vegetation and any exotic or rare species, hydrologic characteristics, and wildlife and fishery habitat. Copies of the completed data sheets from the survey can be obtained from the City.

Characterization of adjacent upland areas was also noted for land use, disturbances, or other influences on the wetland basins. Photographs of each basin were taken and are maintained on file at the City as a historic reference.

Wetlands discovered to no longer be present were deleted from the maps, while major changes to the boundaries were also completed. Field mapping of wetland boundaries was not completed, however.

The field assessment resulted in the collection of data on 314 wetland basins, complexes and riverine segments and a total of 2,678 acres of wetland habitat. This total included all of the lakes, any storm water treatment ponds that were also on the NWI, and tended to divide complexes into separate basins based on wetland type, rather than as contiguous units. The intention of this was to maximize management opportunities, but has had the end result of including lakes and ponds in the survey. These features are generally not regulated as wetlands, and their inclusion in the 1998 plan has had the effect of amplifying the total number of basins acres of wetlands within the city. This is exemplified by the wetlands around Black Dog Lake. The 1998 Plan includes the lake, and has mapped the area surrounding the lake as 12 different wetlands. The 2006 revision has removed Black Dog Lake as a wetland, and has the surrounding area identified as two unique wetlands divided by the railroad.

3.1.1 Wetland Inventory Database

The 1998 Plan made a bold step and advanced the usefulness of the wetland inventory by maintaining the data electronically and classifying each basin into a management class. The SEH Natural Resource Evaluation Method was used in the assessment and ranking of the wetland resources in the City. This evaluation method was unique, but similar to the first generation of the Minnesota Routine Assessment Methodology. Similar criteria for evaluation of the wetland basins can be found in the Minnesota Natural Heritage Program (NHP), and several other sources in order to evaluate both natural and disturbed communities and other open spaces. The SEH evaluation method was also used in the City's original Natural Resources Master Plan.

3.1.2 Wetland Classification

For each wetland, a numeric point value was assigned for each wetland function, which resulted in a total point value for each basin. Additional information was assembled from the Wetland Inventory, the City's existing GIS data, the City's 1994 Storm Water Management Plan, the Dakota County Biological Survey and other sources. Those wetlands containing endangered, threatened, or special concern species and those located within significant communities identified by the Dakota County Biological Survey were given special consideration. Public Waters were identified from the MNDNR's Protected Waters Inventory Maps.

The existing classification from the City's Storm Water Management Plan was reviewed with City staff and revised when necessary. The presence of man made hydrologic connections (storm sewer) and level of surrounding development was also used in the determination. The sensitivity to storm water impacts was determined according to the Guidance for Evaluating Urban Storm Water and Snowmelt Runoff Impacts to Wetlands. Lastly, the proximity of each basin to other wetlands and existing City parks was determined. Although no points were applied to this additional data, the information was used in the final determination of wetland classification and influenced the proposed management of wetland resources.

The database and supplemental data were used to determine the classification of each wetland basin by sorting the data according to total points and applying the following ranking strategy.

- *Protection Areas* - Basins with Native Grades of A or B, sites with complete Community Structure, any sites supporting rare species, and any sites within or adjacent to significant natural communities as identified by the Dakota County Biological Survey. This is comparable to the Preserve Classification used in the MnRAM.
- *Improvement Areas* - Basins with 3 of 4 of the Community Structure criteria, sites greater than ten acres in size, Minnesota Department of Natural Resources Protected Waters and Wetlands (Public Waters), and basins within existing City parks that are not classified as Protection Areas. Although there is some overlap, this classification is similar to the Manage I and Manage II MnRAM classifications.
- *Management Areas* - Remaining wetlands, but generally of low quality and located outside of protected areas. These wetlands are also likely to receive untreated storm water runoff, but have not been altered to enhance treatment capabilities. This classification is comparable to the Manage II and Manage III MnRAM classifications.

3.2 Description of 2006 Inventory

During the summer of 2006, the results of the 1998 inventory were reviewed to determine if it was still accurate, both with respect to mapping accuracy and to the management classification. This involved tasks of reviewing the mapping of each basin to determine if the wetland was still present, if the boundary was accurate, and if the basin was wetland or a non-wetland water feature.

The mapping of the 2006 inventory was accomplished by comparing the 1998 inventory to high resolution aerial photographs of the City taken in 2005. The inventory was reviewed again in 2007 using high resolution 2006 aerial photographs that had become available following the initial field reviews. The use of high-resolution photos is a marked improvement upon the technology available for the 1998 Plan. Each basin was reviewed, and the boundaries adjusted appropriately. Adjustments ranged from very minor boundary changes to elimination of the basin as it was no longer present.

Several changes to what was included in the inventory also occurred. For starters, seven lakes were dropped from the inventory. These are classified as deep water habitat, and would not be regulated under this plan, but would remain regulated under other plan and agencies. No protection was reduced with the changes to the inventory. The other change was the removal of any area that currently functions to provide storm water treatment, and have been verified to have been created in non-wetland areas. Ponds that have been potentially created from former wetland have remained, but have been designated as a Management II classification. The Management II classification would still be regulated under the Wetland Conservation Act for alterations, but would not require additional protection from this Plan.

Additional Classification added to the 2006 plan update:

- *Management II Areas* – These basins include any of the water features that may have been historic wetlands, and would remain subject to the requirement of the Wetland Conservation Act. These basins would not be subject to reduced wetland protection standards, however, as they no longer function as natural wetlands.

3.2.1 2006 Inventory Results

The 2006 inventory mapped a total of 264 wetlands, which are shown in Figure 5. These wetlands covered 1,794 acres of land, and represent all of the Circular 39 types, with the exception of Type 8

bog. For the purposes of this Plan, wetlands have been classified as one primary wetland type, even though a majority of the wetlands are not solely just one type.

Table 3 lists the distribution of the wetlands identified in the 2006 inventory.

Table 3 Summary of Basins Based on Wetland Type			
Wetland Type	Description	Number of Basins	Total Area¹ (acres)
Type 1	Seasonally Flooded	16	55
Type 2	Wet Meadow	11	12
Type 3	Shallow Marsh	72	1,041
Type 4	Deep Marsh	54	73
Type 5	Shallow Open Water	52	158
Type 6	Scrub Shrub	7	35
Type 7	Wooded Swamp	18	418
Riverine	Rivers and Streams	1	1
Pond	WCA-regulated Storm Water Ponds	35	31
Total		270	1,824

¹ Rounded to nearest whole number

3.2.2 Comparison of Wetland Inventories

As previously noted, the 1998 inventory contains several lakes and ponds, and significantly fragmented the basins to provide both a high number of wetlands, and also a larger wetland area. For this reason, a direct comparison of the two inventories isn't legitimate, as the 2006 update will appear to be much smaller, and suggest a significant loss of wetlands. To accurately compare the 1998 and 2006 inventories, the data for the lakes and storm water ponds must be considered. Table 4 shows the comparison of the two inventories.

Table 4 Comparison of NWI, 1998, and 2006 Inventories		
Wetland Type	Total Area (acres)	
	1998¹	2006
Type 1	62	55
Type 2	8	12
Type 3	944	1,041
Type 4	174	73
Type 5	1,103	158
Type 6	128	35
Type 7	166	418
Riverine	93	1
Storm Water Ponds ²		31
Storm Water Ponds ³		30
Lakes ⁴		931
Totals	2,678	2,785

¹ Note that lakes and storm water ponds are included as wetlands
² WCA-regulated

³ Created in upland areas and are exempt under WCA
⁴ These are regulated through the Surface Water Management Plan and shoreland ordinances, except for Wood Park and Twin Lakes

Including lakes and storm water ponds to the totals, the area of wetlands and water features between the NWI, 1998 inventory, and 2006 inventory are similar. The slight increase of 107 acres of wetland and water resources between 1998 and 2006 is at least partially explained by the addition of more storm water ponds and wetland restoration work completed in the City since 1998. Changes in mapping accuracy also account for some of the differences.

In summary, the 2006 inventory has improved the accuracy of the mapping, and has demonstrated that there has not been a significant change in the amount of wetland and water resources in the City since 1998. Based on these values, it appears that the goal of “no net loss” has been achieved.

3.3 Functions and Values Assessment and Wetland Classifications

In addition to more accurate mapping, the 2006 inventory sought to evaluate the wetland classification system to see if the 1998 system was comparable to more recent assessment methods. This was completed by subsampling the 1998 inventory and assessing each basin using the MnRAM 3.0. The results of this comparison are described on the following pages.

3.3.1 Comparison of Wetland Classifications

The objective of this comparison was to reevaluate a subset of wetlands in the City of Burnsville using the MnRAM 3.0 and verify that the current management classes established in 1998 (Protection, Improvement, and Management) still accurately represent the basins. The MnRAM electronic database allows the user to answer questions relating to wetland vegetative quality as well as functions such as flood attenuation, maintenance of an area’s hydrologic regime, wetland water quality, shoreline protection, aesthetics, and wildlife and fish habitat, among others. A score is calculated for each of the wetland functions, and one of the following overall management classes is assigned to the wetland: Preserve, Manage 1, Manage 2, and Manage 3. Details of the MnRAM process are included in Appendix D.

The Management II classification was added after this comparison and incorporates the storm water ponds that are presumed to have formerly been wetland. This fourth category used in the updated plan does not affect the comparison between the 1998 classifications and the 2006 MnRAM evaluation.

Ten wetland basins in each of the Protection, Improvement, and Management classes were chosen at random and reevaluated using the MnRAM. Wetlands obviously impacted by recent development, wetlands converted to storm water ponds, and wetlands in the Minnesota Valley National Wildlife Refuge were not included as potential resurvey locations, as the MnRAM results may be skewed and not allow for accurate comparison.

Table 5 illustrates the comparison between the current management class and the MnRAM management class for each of the thirty wetlands reevaluated. The table includes the current city identification, identification code created by the MnRAM, the identification of the basin if it is a Public Water, the classification of the basin in the current system, the classification generated by the MnRAM, and a note if the classification systems are significantly different between the two methodologies. A significant difference is a change in any direction greater than one step in classification. This is used since the city classifications originally used in the 1998 plan had three categories, while the MnRAM has four, and direct comparisons are not possible. The addition of

Management II to the 2006 Plan, is not necessarily a direct comparison to the Manage II classification used in the MnRAM.

Table 5 Comparison of Wetland Management Classes					
Wetland ID		MN DNR PWI	1998 Classification	2006 MnRAM 3 Classification	Major Change
City ID	MnRAM 3 ID				
Protection Class					
11	19-115-21-20-011-A		Protection	Manage 1	No
62	19-115-21-27-062-A		Protection	Manage 1	No
93	19-115-21-34-093-A		Protection	Preserve	No
141	19-115-20-17-141-A	192W	Protection	Manage 2	Yes
152	19-115-20-29-152-A		Protection	Manage 2	Yes
155	19-115-20-29-155-A	358P	Protection	Manage 1	No
188	19-115-21-24-188-A		Protection	Manage 1	No
206	19-115-20-29-206-A		Protection	Manage 1	No
259	19-115-21-34-259-A		Protection	Preserve	No
312	19-115-21-34-312-A		Protection	Preserve	No
Improvement Class					
46	19-115-20-32-046-A		Improvement	Preserve	Yes
68	19-115-21-35-068-A	382W	Improvement	Manage 1	No
80	19-115-21-35-080-A		Improvement	Manage 2	No
117	19-027-24-36-117-A	174W	Improvement	Manage 2	No
157	19-027-24-35-157-A		Improvement	Manage 1	No
161	19-027-24-35-161-A	171W	Improvement	Manage 2	No
164	19-115-20-18-164-A	114W	Improvement	Manage 1	No
168	19-115-20-18-168-A	116W	Improvement	Manage 2	No
232	19-115-20-17-232-A		Improvement	Manage 1	No
247	19-115-20-17-247-A		Improvement	Manage 1	No
Management Class					
110	19-027-24-36-110-A		Management	Manage 2	No
116	19-027-24-36-116-A		Management	Manage 2	No
121	19-027-24-36-121-A		Management	Manage 2	No
144	19-115-20-17-144-A		Management	Manage 2	No
165	19-115-20-18-165-A		Management	Manage 2	No
167	19-115-20-18-167-A		Management	Manage 2	No
178	19-115-20-17-178-A		Management	Manage 2	No
198	19-115-20-30-198-A		Management	Manage 2	No
213	19-115-20-29-213-A		Management	Manage 2	No
215	19-115-20-29-215-A		Management	Manage 2	No

Out of ten wetlands in the current Protection class that were reevaluated using the MnRAM, three were rated as Preserve, five were rated as Manage 1, and two were rated as Manage 2. It was expected that wetlands in the Protection class would be rated as Preserve and Manage 1. The wetlands that were reevaluated and rated as Manage 2, Wetlands 141 and 152, have undergone severe

vegetation or hydrology alterations. Wetland 141, previously dominated by native sedges, is now dominated by purple loosestrife (*Lythrum salicaria*). Wetland 152, also previously dominated by native sedges and rushes, is now dominated by smartweeds and reed canary grass (*Phalaris arundinacea*) and has seen a measurable decrease in hydrology. In general, the basins that were expected to be protect, but no longer meet the highest criteria, have had a significant change causing them to drop in status.

Out of ten wetlands in the current Improvement class that were reevaluated using the MnRAM, five were rated as Manage 1, four were rated as Manage 2, and one was rated as Preserve. It was expected that wetlands in the Improvement Class would be rated as Manage 1 or Manage 2. The wetland that was reevaluated and rated as Preserve, Wetland 46, is a shoreline wetland on the fringe of Keller Lake. It received a high rating for shoreline protection, therefore was designated as Preserve by the MnRAM, the older methodology would not have considered this as highly as MnRAM does, which would explain the lower classification.

All of the ten wetlands in the current Management class that were reevaluated using the MnRAM were rated as Manage 2. It was expected that wetlands in the Management class would be rated as Manage 2 or Manage 3 by the MnRAM. Manage 3 wetlands are rated as low for vegetative diversity and also rate low for most other wetland functions except flood attenuation and downstream water quality protection. It is possible that wetlands that would be rated as Manage 3 by the MnRAM are already functioning as storm water ponds and therefore were not included in this resurvey. In general, MnRAM does not assign a significant number of basins to the Manage 3 category as these basins must be degraded and also fail to provide water quality improvement and/or flood attenuation. Most degraded wetlands function highly for storm water and flooding, so they end up being classified by the MnRAM as Manage 2.

With the exception of two wetlands out of 30 that declined in protection, all of the reviewed basins were similar or had improved protection under the 1998 classifications. As the comparison between the 1998 classifications and the more recent MnRAM provide similar results, it has been determined that there is no need to redo the entire functions and values assessment for the remaining basins. The three wetlands that did have a significant change (Wetland IDs 46, 141, and 152) have been updated to follow the MnRAM classifications, all other wetlands will retain the 1998 classifications in the current Plan. The exceptions to this are for areas of critical resources, which are described next.

3.3.2 Critical Resources

With any functions and values assessment, one of the first measures is to determine if a wetland is identified as a critical resource. Wetlands in the assessment area are evaluated for designation as critical resources based on several features defined by Minnesota Statutes. These critical wetland resources should be classified into the Protection management class due to their special functions. This classification is automatic, and will be used regardless of what classification is actually determined using the evaluation method.

Criteria for designating wetlands as critical resources are as follows:

- Outstanding Resource Value Waters (Minn. Rules 7050.0180)
- Designated Scientific and Natural Areas (Minn. Rules 86A.05)
- Wetlands with known occurrences of Threatened or Endangered Species (Minn. Stat. 84.0895)
- State Wildlife Management Areas (Minn. Stat. 86A.05, subpart 8)
- State Aquatic Management Areas (Minn. Stat. 86A.05, subpart 14)

- Wellhead Protection Areas (Minn. Stat. 103I.101, MN Rules Chapter 4720)
- Sensitive Ground Water Areas (MN Rules 8420.0548, Subp. 6)
- Designated trout streams or trout lakes (MN Rules 6264.0050)
- Calcareous fens (MN Rules 8420.1010 through 8420.1060)
- High priority areas for wetland preservation, enhancement, restoration and establishment (MN Rules 8420.0350, subpart 2)
- Designated Historic or Archaeological Sites
- State or federal designated wild and scenic rivers (MN Rule Chapter 7050)
- MN Pollution Control Agency “special waters search” mapping utility

A description of the critical resources located within the city follows.

3.3.3 Calcareous Fens

Calcareous fens are defined in MN Rules 8420.1020 as peat-accumulating wetlands dominated by distinct groundwater inflows having specific chemical characteristics. The water is characterized as circumneutral to alkaline, with high concentrations of calcium and low dissolved oxygen content. The chemistry provides an environment for specific and often rare hydrophytic plants. Minnesota Rules 8420.1010-1070 sets out minimum standards and criteria for the identification, protection, and management of calcareous fens as authorized by Minnesota Statutes, section 103G.223. The MNDNR is charged with identifying and maintaining a list of calcareous fens in the state and maintains a database of them. Calcareous fens are also listed in the Classifications for Waters in Major Surface Water Drainage Basins. Finally, the rules for Nondegradation of Outstanding Resource Value Waters also list identified calcareous fens in the state.

3.3.3.1 State Wildlife Management Areas

State wildlife management areas are established to protect those lands and waters which have a high potential for wildlife production and to develop and manage these lands and waters for the production of wildlife, for public hunting, fishing, and trapping, and for other compatible outdoor recreational uses. State wildlife management areas satisfy the following criteria:

- Includes appropriate wildlife lands and habitat, including but not limited to marsh or wetlands and the margins thereof, ponds, lakes, stream bottomlands, and uplands, which permit the propagation and management of a substantial population of the desired wildlife species; and
- Includes an area large enough to ensure adequate wildlife management and regulation of the permitted recreational uses.

3.3.3.2 Designated Trout Streams

Designated trout streams and lakes in the state of Minnesota are inhabited by trout other than lake trout. Fishing and other restrictions have been placed on these waterbodies to protect and foster the propagation of trout. Wetlands associated with these streams and lakes are an integral part of the whole ecosystem that functions to maintain the characteristics necessary to support the cold-water fishery.

Wetlands with Known Occurrences of Threatened or Endangered Species

Endangered and threatened plant and animal species are protected under Minnesota Statute 84.0895 and are designated as one of three categories:

- Endangered, if the species is threatened with extinction throughout all or a significant portion of its range.
- Threatened, if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
- Species of Special Concern, if although the species is not endangered or threatened it is extremely uncommon in this state, or has unique or highly specific habitat requirements and deserves careful monitoring of its status.

In 1987 the state began a systematic survey of rare biological features through the Minnesota County Biological Survey. The goal of this survey was to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants and animals. The data collected by the county biological survey is available through published maps of each county. The data available for Burnsville is through the *Natural Communities and Rare Species of Dakota County, Minnesota*. This resource identifies rare natural communities or rare plant species within the Minnesota Valley National Wildlife Refuge, Murphy-Hanrehan Regional Park, and south of Lake Alimagnet.

The City of Burnsville has wetlands that meet some of these criteria including the large wetlands along the Minnesota River, which are part of the Minnesota Valley National Wildlife Refuge and the Minnesota Valley Wildlife Refuge. This also includes Black Dog Fen, and the Black Dog Scientific and Natural Area. One Mile Creek and two unnamed creeks would also be included as they are designated trout streams, although they are not associated closely with any wetlands. The City also has an abundance of high quality habitats that are known to contain threatened and endangered species. These areas are not restricted to wetlands, although the wetlands would be the prime emphasis for protection under this Plan. The 1998 Plan has several of the basins along the Minnesota River as Improvement and Management classes, although they are located in the Minnesota Valley National Wildlife Refuge. These basins have been upgraded to Protection status.

3.3.4 Summary of Wetland Classification results

The classification system from 1998 has been tested to still be relevant, and will be maintained as the classification system for the Plan update. There are some exceptions to this generality; however, including:

- Any Critical Resource wetland has been attributed to the Protection classification regardless of what the classification was in 1998. This has significantly increased the amount of wetland in the Protection classification by adding the wetlands along the river and Black Dog fen to that category. This is somewhat deceiving as the summary of results in Table 6 shows a decrease, but all of the lakes, which are now removed from the wetland inventory, had previously been included as Protection basins.
- The three wetlands (ID's 46, 141, and 152) that had significant differences between the 1998 classification and 2006 MnRAM have been changed to the equivalent MnRAM-determined classification.
- Eight lakes and all of the storm water ponds that were not formerly wetland have been removed from the inventory. This reduces the total wetland area, but provides a more accurate measure of how much is protected under the wetland plan.

- The Management II classification has been added, and is used to categorize storm water ponds that are still regulated as wetlands. This additional classification dilutes the results somewhat, but does not constitute a significant percentage of the basins or changes that were made.

Overall, the amount of wetland that has been categorized within the Protection category is nearly three quarters of the total wetland area. Granted this is skewed by the vast amount of wetland along the Minnesota River, but nonetheless provides maximum protection for the majority of the resources. A comparison of the changes in classification from 1998 to 2006 demonstrates that there is no plan to diminish protection. If anything, both the protection standards and the number of protected basins are significantly increased with the 2006 Plan.

Table 6 summarizes and compares the distribution of wetland classifications in 1998 and 2006.

Table 6 Summary of 1998 and 2006 Wetland Classifications				
Classification	Total Area (acres)			
	1998		2006	
	Acres of Wetland¹	Percent of Basins in Category	Acres of Wetland	Percent of Basins in Category
Protection	1,521	57	1,375	75
Improvement	887	33	247	14
Management	272	10	171	9
Management II ²	0	0	31	2
Totals	2,680		1,824	
¹ 1998 Plan included lakes and storm water ponds, which gives an higher total acreage of wetlands than the 2006 plan. This is a change in what is included as wetlands, and does not reflect a loss of wetlands between the inventories				
² Management II was not a category in the 1998 Plan				

3.4 Analysis of Wetland Restoration and Creation Opportunities

As part of the investigation of the wetland inventory, there was also an opportunity to look for potential areas of wetland restoration and creation. The 1998 Plan had identified areas of restoration opportunities, but relied on identifying areas that contained mapped hydric soils, but were not currently wetland. The assumption was that areas of mapped hydric soil were wetland, and that opportunities to restore these areas were probable. Refinement beyond correlation between hydric soils and no wetlands being present was not completed.

The 2006 Plan has also looked for opportunities to either restore wetlands or create new wetland areas. While the basic concept of looking for hydric soils that are not currently wetland is still used, the process has been refined. The current identification of potential restoration opportunities has been completed by compiling a significant amount of GIS data, including: Hydric soils, the National Wetlands Inventory, subwatershed divides (to determine potential drainage areas), landuse (defining open space, parks, public lands, and vacant properties), topography, and storm water infrastructure. This information is available on the City's GIS database. Maps used in this analysis are available in .pdf format upon request.

All of the available data was compiled to try and find areas where a majority of positive features, such as hydric soils, on vacant land, with a large contributing watershed, were present. Using topographic information and high resolution area photographs, the sites with positive indicators were investigated

further to see if conditions would allow for restoration opportunities to occur. The focus was on larger areas, typically exceeding one acre in size. Smaller areas where wetland could be created are certainly present, but would be difficult to discern in a large scale review. Potential areas located on private property have also been identified, although it is understood that restoration in these areas will not be feasible without the owner's participation. Several of the identified potential wetland creation areas are also wooded. Often wooded sites are not selected as the tree removal is undesirable, but in identifying potential areas, this has not been used to reject sites.

Several potential areas were identified that would be suitable for additional investigation. The majority of the potential areas are located in the north third of the city near the river. There appears to be considerable areas of mapped hydric soils, but the drainage patterns have been altered, or the areas have been filled in. The northern portion of the city has an advantage as it is lower in elevation and has some storm water flow toward that area. Excavation and manipulation of drainages may be sufficient to provide hydrology to these areas.

There are fewer opportunities in the southern two thirds of the city as it is mostly developed, and has less available land for restoring wetlands. There is also more topographic variation, with much more relief that is generally not favorable for ponding water. Most of the small depressions and waterways are currently wetland, or are not suitable for restoration/creation. Some small opportunities are available in some of the city parks, however.

Figure 5 includes the potential wetland restoration or creation areas.

4.0 Existing Wetland Management Priorities and Objectives

Although one of the main purposes of the WPMP is to allow the City to regulate and manage their wetland resources, there are several layers of protection already in place. These regulations may be implemented at the state, local, or federal level, and can come from a variety of agencies and organizations. The following are summaries of some of the main agencies and organizations that may be encountered.

4.1 Minnesota Wetland Conservation Act (WCA)

The WCA was first passed in 1991 and has been subsequently amended as the Act has evolved. The Board of Water and Soil Resources (BWSR) is the lead agency for administering the WCA, and its guidelines are published in Minnesota Rules 8420. The BWSR website posts the most current wetland regulatory information available (<http://www.bwsr.state.mn.us/index.html>) The intent of the WCA was to achieve no net loss of wetlands in the state. This is achieved by regulating the filling, draining, excavation, and alteration of wetlands within the state. There are some notable exemptions, such as allowing temporary impacts, utility crossings, farming of wetlands, and allowing small impacts to occur (de minimis). If an activity cannot avoid impacts and certain thresholds of impacts are met, creation of new wetland, or restoration of an altered or drained wetland must occur.

The WCA is administered by the Local Government Unit (LGU), which is the City of Burnsville for all areas within the city limits. This authority, within the rules of the WCA, allows the city to regulate wetland impacts and replacement criteria. The city is assisted with the administration of the WCA by a Technical Evaluation Panel (TEP). The TEP is comprised of the LGU, plus representatives of the BWSR, the County Soil and Water Conservation District (SWCD), and the MNDNR. Other agencies and experts may be invited to attend TEP meetings, but are not voting members.

4.2 Minnesota Department of Natural Resources

The Minnesota Department of Natural Resources has regulatory authority of Protected Waters and Protected Water Wetlands, which are identified on the Public Waters Inventory (Figure 3). Public Waters include both Protected Waters and Protected Water Wetlands. Regulatory authority is to all areas below the Ordinary High Water (OHW) elevation of lakes and any area below the top of bank for rivers and streams. If an OHW has not been set, which is often the case for Protected Water Wetlands, the jurisdiction will be the delineated wetland edge.

Within the city, there are eight listed Protected Waters, 36 Protected Water Wetlands, and three waterways, which are also the designated trout streams. Public Waters maps are also available for viewing at the MNDNR's website

(<http://www.dnr.state.mn.us/waters/watermgmtsection/pwi/maps.html>). Work below the OHW or within the channel of a Protected Water may require a permit from the MNDNR. Water appropriations may also require permits depending on the rate and amount of water used. Administration of the MNDNR's regulations is conducted by the Area Hydrologist.

4.2.1 State of Minnesota Buffer Law

State of Minnesota Buffer Law (Minnesota Statutes 2014, sections 103B.101, subdivision 12; 103E.315, subdivision 8; Minnesota Statutes 2015 Supplement, sections 103B.101, subdivision 12a; 103F.48, subdivisions 1, 3, 4, 7, 8, 10 and CHAPTER 85--S.F. No. 25031 2016 amendments) requires the establishment of either a 50-foot average, 30-foot minimum, continuous buffer of perennial rooted vegetation around all public waters, streams, and public ditches as identified and mapped on a buffer protection map. The buffer protection map is maintained by the Minnesota Department of Natural Resources, through a buffer mapping website (<http://arcgis.dnr.state.mn.us/gis/buffersviewer/>). The buffer law is administered by the Board of Water and Soil Resources (BWSR), with technical support

for land owners provided by the Dakota County Soil and Water Conservation District. Resources requiring protection under the buffer law are present in the City of Burnsville, but are limited to ten public waters, and four unnamed streams draining into Black Dog Lake. These aquatic resources currently meet the standards of the buffer law, and no action is required to comply with the recently implemented legislation. The current buffer standards incorporated in the Burnsville Surface Water Management Plan exceed the state requirements for the aquatic resources, which protects these resources should adjacent land use change.

4.3 United States Army Corps of Engineers

The USACE regulates filling and excavation of wetlands through Section 404 of the Clean Water Act. It also regulates impacts to navigable waters through Section 10 of the Rivers and Harbors Act, which includes the Minnesota River. The USACE has regulatory authority over any navigable water, and any wetlands hydrologically connected or adjacent to them. Currently, the USACE does not have the authority to regulate isolated wetlands, which are relatively abundant in Burnsville. Future legislative action may change this restriction, however, so care should be taken that regulations in place at the time a project commences be reviewed.

Any impacts, including filling, dredging, or excavation may require a permit from the USACE. Additionally, the USACE also approves wetland delineations, and can participate on a Technical Evaluation Panel. Permitting is conducted through the regulatory branch, and agents are identified on a by county basis. More specific information of the USACE regulatory process can be found at their website (<http://www.mvp.usace.army.mil>).

4.4 Watershed Management Organizations

Within the city limits are three watershed management authorities including Black Dog Watershed Management Organization, the Lower Minnesota River Watershed District, and the Vermillion River Joint Powers Organization. The former Credit River organization is currently administered through the Black Dog WMO. These organizations may have additional regulatory requirements which must also be complied with for both the surface water and wetland components of the Plan. All of these organizations have management plans and requirements for compliance in their respective areas.

More information on these organizations can be found on their websites

Black Dog WMO - <http://dakotacountyswcd.org/watersheds/blackdogwmo/>

Lower Minnesota River WD - <http://www.watershreddistrict.org/index.html>

Vermillion River JPO - <http://www.co.dakota.mn.us/CountyGovernment/PublicEntities/VermillionJPO/default.htm>

4.5 City of Burnsville

There are numerous planning tools which can be used to implement and guide the land-use and development decision-making process with regard to wetland resources. They can be divided into regulatory and non-regulatory categories. The best strategy is to utilize a combination of planning tools.

4.5.1 Non Regulatory Tools

Non-regulatory planning tools are strategies to protect a resource by obtaining it and choosing not to develop it. These tools are likely to have a more permanent impact than regulatory tools. Rules and regulations may change if the political climate changes, but if a property or its development rights are obtained and it is designated for non-development, it is more likely to remain undeveloped. Listed

below are nine non-regulatory planning tools appropriate for consideration in protecting wetland habitats.

- Outright Purchase
- Purchase of Development Rights
- Grants
- Land Banking
- Land Trusts or Conservancies
- Cooperative Agreements
- Covenants
- Endowments
- Condemnation

4.5.2 Regulatory Planning Tools

Regulatory planning tools are those rules and regulations that are designed to protect adjacent land uses from one another and are intended to be used as a guide on how development should occur. Regulatory planning tools are mandated by government agencies and consist of set rules and procedures that are to be followed. These regulations can be designed to protect and preserve wetlands and other natural areas. A combination of regulatory planning tools is recommended as the best strategy to ensure the preservation of natural areas. Listed below are six different regulatory planning tools that can be used in natural resource preservation.

- Overlay Zoning
- Performance Zoning
- Cluster Development
- Planned Unit Development (PUD)
- Subdivision Regulations
- Dedication

The City of Burnsville is the Local Government Unit (LGU) responsible for implementation of the WCA within the boundaries of the City. The WCA is enforced through Chapter 8 of the City Zoning Code, Environmental Overlay Districts. The Environmental Overlay District ordinance provides for the protection of wetlands and other natural resources, including restrictive and erosive soils, woodlands and shoreland areas.

5.0 Wetland Protection and Management Plan Strategies

It is a priority in the City of Burnsville to preserve and enhance the quality of the natural resources in the community. The following are the policies that will be utilized by the city of Burnsville to preserve and evaluate the community's wetland resources.

- Maintain primary responsibility for managing water resources at the local level but continue coordination and cooperation with other agencies and organizations.
- Establish appropriate protection criteria based on wetland functions and values
- Achieve water quality standards in lakes, streams, and wetlands consistent with their designated uses and established classifications.
- Protect and rehabilitate wetlands to maintain or improve their function and value.
- Minimize soil erosion and sedimentation in wetlands. Improve Water Quality.
- Use GIS and available resources on restorable wetlands to identify likely areas of wetland restoration. Identify opportunities to control invasive species.
- Provide information and educational resources to improve knowledge and promote an active public role in management of water resources.

5.1 Management Standards

Following are the strategies and standards that will be used to protect, preserve, and manage Burnsville's wetland resources. The requirements apply to all areas meeting the regulatory definition of wetland habitat, regardless of their inclusion in this wetland inventory. The classification of wetlands identified outside of this inventory will be calculated using the MnRAM version in use at the time of discovery. A discussion of the MnRAM process and conversion table from MnRAM derived classifications to the City classifications is in Appendix D.

The following management strategies will apply to both new development and redevelopment projects submitted to the City for review and approval. Any wetland habitat on the property to be developed will be subject to the following management standards, as well as the rules and requirements of the Wetland Conservation Act and other City regulations, regardless of the proposed direct or indirect impacts to wetland habitat.

5.1.1 Educational and Cultural Strategies

1. The City will distribute information on pertinent water and wetland management issues via the Burnsville Bulletin. The Bulletin will be the primary source of information to identify opportunities for residents to participate in wetland management activities.
2. The City will make an ongoing effort on both a local and regional level toward educating the public by distributing information to its residents on responsible practices they should employ to protect water resources within the community. The program shall also educate residents on the proper use of fertilizer and lawn chemicals, and the effects of these on wetlands and waters.
3. The City will promote the use of native vegetation to buffer shoreland and wetland fringe habitats.

5.1.2 Regulatory Standards

1. The City of Burnsville will accept the local governmental unit responsibility for wetland management and will protect and manage these wetlands in conformance with the requirements

- of the Wetland Conservation Act, as amended, and its associated rules (Minnesota Rules Chapter 8420).
2. The City of Burnsville will utilize the available technical resources of outside agencies, such as the members of the Technical Evaluation Panel, Dakota Soil and Water Conservation District, the Board of Water and Soil Resources, the U.S. Army Corps of Engineers, the Minnesota Department of Natural Resources, and/or the Watershed Management Organizations for review of private developments and City-proposed projects that may affect wetland resources. The City will utilize the U.S. Fish and Wildlife Service, Minnesota Valley National Wildlife Refuge for review of projects that abut the Refuge.
 3. The City will utilize the wetland inventory information developed in this Plan to preliminarily identify the general location of wetlands. Project proposers must provide field delineation in accordance with applicable rules and regulations to determine the jurisdictional boundaries of wetlands. The City will only accept delineations completed by a Certified Wetland Delineator, or a wetland delineator that has been preapproved by City staff. A report of the results of the field delineation, including the methodology and findings of the delineation and a printed and electronic copy of the approved delineation boundary will be required. Electronic copies of the coordinates of the delineated boundary shall also be provided either in ascii, cadd, or GPS compatible format.
 4. Prior to any site development activities, the City will complete a site inspection to identify the location and extent of any wetlands present. The results of the inspection will be compared to the field delineation data provided by the developer. Protection of wetland functions and values will be provided in accordance with the requirements of this Plan through the City's Wetlands Overlay District Ordinance.
 5. Any review of a proposed wetland encroachment will initially address the issue of avoidance and project alternatives. It will be the City's policy that, prior to allowing any wetland encroachment, all reasonable attempts to avoid such alteration must be demonstrated. This avoidance must also consider the reasonableness of the no build alternative. This process is described collectively as sequencing.
 6. Sequencing Flexibility, as defined in the Wetland Conservation Act, may be applied to Management Area wetlands. Sequencing Flexibility shall not apply to wetlands classified as Improvement or Protection. Before approved, projects must still demonstrate that efforts have been taken to both avoid and minimize impacts to all wetlands.
 7. Replacement for unavoidable wetland impacts will be provided by the developer within the City of Burnsville, and within the same watershed in accordance with the requirements of the Wetland Conservation Act. If wetland mitigation is not possible within the City limits, the replacement wetlands should be located as close to the impacted wetland as possible, preferably within the same watershed. Minimum replacement ratios shall follow those identified in the WCA, but the City may increase the replacement ratios for replacement outside of the City Limits, up to a maximum of 4 to 1
 8. Completion of a MnRAM assessment shall be completed on all impacted wetlands to establish the functions and values of that basin. All replacement areas will also require a MnRAM assessment to document that lost functions and values have been replaced. The MnRAM assessments shall be completed by a Certified wetland professional using the most current version of the assessment tool available, and should be submitted with a replacement plan.
 9. Credits for non-wetland creation/restoration/preservation (such as upland buffer) will be allowed in accordance with current WCA standards.

10. The City will not allow excavation or other non-filling related alterations to an existing wetland without the expressed written approval of the LGU. Excavation within the boundaries of existing wetlands will be allowed only if the action will not change the use or character of the basin.
11. Excavation within wetlands may be allowed without replacement in basins classified as Management if they are Type 1 or Type 2 wetlands, provided this is consistent with the WCA. Excavation will not be allowed in Type 1 or Type 2 wetlands classified as Improvement or Protection Areas, unless it can be shown that the proposed excavation will improve or enhance the functions and values of the basin. No excavation will be allowed in the permanently or semipermanently flooded portions of Type 3, 4, and 5 wetlands regardless of classification without replacement.
12. Regulation of storm water impacts on wetlands shall be in accordance with the requirements of the Storm Water Management Plan. A summary of the requirements is presented in Appendix E.
13. The City of Burnsville will require the inclusion of oil skimmers in the construction of new pond outlets. The City will add skimmers to the existing system whenever feasible and practical. The designs shall conform to the requirements of the City’s Storm Water Management Plan.
14. Buffers of natural vegetation must be maintained outside the wetland boundary in accordance with Table 7. Exceptions to the width of the buffer can be made for Management Areas if the buffer results in a hardship. The presence of a buffer is beneficial to the pollutant and nutrient removal capabilities of all wetlands.

Table 7 Wetland Buffer Requirements			
Wetland Classification	Permanent Buffer Strip Average Width (feet)	Minimum Permanent Buffer Zone Width (feet)	Percentage Native Vegetation
Protection	50	30	Entire
Improvement	35	25	Entire
Management	25	20	Majority
Management II	20	20	Majority

15. Erosion and sedimentation control plans shall be reviewed and enforced by the City of Burnsville for all new developments and redevelopments. These plans shall conform to the general criteria set forth by the City’s erosion and sediment control ordinance.
16. The City of Burnsville supports the use of wetland banking for the replacement of wetland impacts to Management Area wetlands. Those proposing banking projects are encouraged to locate mitigation banks in those watersheds within the City having lost significant wetland habitat and at sites approved by the City. Restoration of wetland habitat is preferred to wetland creation, when possible. Priorities for wetland banking include the potential restoration sites identified in this plan, interspersed wetland types, successful revegetation with diverse native species, areas greater than 10 acres in size and position within a watershed that provides needed functions.
17. The City will encourage developers to include wetland improvement as well as wetland protection strategies in proposed development and redevelopment projects.
18. The City will use the potentially restorable wetland areas identified in the Plan to look for future opportunities to restore wetlands. The City will assess opportunities for purchase of vacant properties with restoration or wetland improvement opportunities. Incentive to explore property acquisition may include the need for wetland mitigation or banking for City projects,

identification of a significant resource needing preservation, identification of tax forfeited property, or offer of purchase by the property owner.

19. Annual monitoring of wetland replacement, banking, and improvement projects will be required as specified in the rules of the Wetland Conservation Act. The City will maintain an escrow account for each development or redevelopment project requiring wetland monitoring. A portion of the escrow will be returned to the developer each year upon receipt of the annual report. Any remaining balance in the account will be returned to the developer upon approval of the project by the Technical Evaluation Panel.

5.1.3 Management Strategies

1. The City will observe the strategies of this Plan in the management of public golf course and park and recreational lands, including open space and athletic fields.
2. The City will continue its involvement in the Wetlands Health Evaluation Program (WHEP) and the Minnesota Pollution Control Agency's Citizen Assisted Monitoring Program (CAMP).
3. The City of Burnsville will sweep the streets at least two times annually. Furthermore, future purchases of street sweeping units will give consideration to street sweepers which have the greatest ability to remove nutrients from the streets within the community.
4. The use of open space and overland flow will be encouraged to improve infiltration wherever it is practical and reasonable to do so.
5. The City will clean all sump catch basins or sump manholes at least annually and more often if inspection demonstrates that more frequent clean out is necessary.
6. The City will develop a retention/treatment basin clean out and maintenance plan that will address maintenance to the extent feasible and practical.
7. The wetlands and associated recreational and wildlife habitat opportunities within the areas zoned as Conservancy Districts will continue to be protected to a maximum practical extent.

Appendix E includes a summary of the water quality, hydrologic alteration, and buffer requirements for the wetland management classifications.

6.0 Implementation Plan

The implementation plan summarizes the schedule for recommended actions, as well as the prioritization of administration, inspections, permitting, public involvement and monitoring programs.

6.1 Wetland Management

Table 8 outlines activity steps that are intended to guide the City in achieving the wetland goals of this Plan. Table 8 also shows a list of possible resources available, the measurement system, and a project target date for each of the identified activities.

Table 8 Wetland Implementation Plan				
ID	Activity/Project	Resources	Measurement	Schedule
1	Implement the wetland management program	<ul style="list-style-type: none"> Wetland inventory GIS database Development reviews 	<ul style="list-style-type: none"> Project review Implemented projects New wetland created 	Ongoing
2	Maintain Wetland Inventory. Update known changes	<ul style="list-style-type: none"> Development projects MnRAM, GIS Database 	<ul style="list-style-type: none"> Maintained, updated database 	Ongoing
3	Update wetland management ordinance	<ul style="list-style-type: none"> Wetland inventory Wetland Ordinance 	<ul style="list-style-type: none"> Completed ordinance update 	2007
4	Assess wetland restoration and banking opportunities	<ul style="list-style-type: none"> Wetland inventory Plan guidelines GIS database 	<ul style="list-style-type: none"> New wetland created 	Annually
5	Continue citizen participation and education	<ul style="list-style-type: none"> Burnsville Bulletin Local papers 	<ul style="list-style-type: none"> Citizen participation Citizen feedback 	Ongoing
6	Review inspection and maintenance of sumps, catch basins, and treatment ponds	<ul style="list-style-type: none"> City Staff GIS database 	<ul style="list-style-type: none"> Annual NPDES report 	Annually
7	Develop summary of wetland guidelines for developers, residents, and city staff	<ul style="list-style-type: none"> Plan guidelines 	<ul style="list-style-type: none"> User feedback 	With any Plan revision
8	Sweep streets giving priority to drainage area of Protected class wetlands	<ul style="list-style-type: none"> GIS database City staff 	<ul style="list-style-type: none"> Number of street sweeps 	2 times annually

6.2 Wetland Monitoring

In order to measure the success of the Plan objectives, it is recommended that periodic monitoring be accomplished. Wetlands are not static. Land use changes and landscape level activities will influence the functional status of wetlands. Changes in the amount of surrounding open space, surface water systems, and ground water can lead to changes in wetland bio-diversity, habitat, dominant vegetative cover, and hydrology.

Monitoring is suggested by periodic review of the inventory and evaluation of the functions and values assessment. Monitoring can be facilitated by requiring a MnRAM assessment to be completed on any impacted wetland as part of any project review. This will allow comparison of the classification to the one in the Plan. This will also be useful to measure and ensure that any replacement wetlands adequately replace the lost functions and values, not just the lost wetland area.

A second monitoring program can look at wetlands in more depth than the MnRAM. The City, in partnership with the Dakota County Environmental Education Program, operates a volunteer wetland

monitoring program named the Wetland Health Evaluation Program (WHEP). Burnsville’s WHEP program allows citizens to assist in monitoring the health of several wetland areas in the City by sampling and documenting wetland plant, frog, and invertebrate communities. Volunteers are trained in how to gather and document the health assessment information. The city will continue to use the WHEP program to assess the health of the community’s wetland resources.

6.3 Amendments to Plan

While the intent of the Plan is to remain as dynamic as possible, there is the potential that portions will require updating before the next major revision. The Plan anticipates this reality, and provides guidelines for amending the plan.

6.3.1 Amendments to Wetland Inventory

The WPMP is intended to be a dynamic and flexible document that will adjust easily to changes in policy and the desires of the City. It is intended that features such as the wetland inventory, wetland boundaries, and other GIS-related features will be reviewed as more accurate data becomes available. For example, an approved wetland delineation should replace the wetland boundary identified in the wetland inventory. The entire inventory will be reviewed for boundary accuracy and to track the status and trends of wetlands a minimum of every 10 years. More frequent review will occur if needed, and can be limited to partial city review if specific areas of interest are identified. Adjustments to wetland boundary, types, and classifications do not require a formal revision to the plan. City staff will be in charge of maintaining the official wetland inventory, which will be the “Wetland Inventory” coverage in the City’s GIS database, rather than a hard copy map.

6.3.2 Amendments to Wetland Classifications

As described in the functions and values section, the official inventory classifications will remain Protection, Improvement, and Management, even though more current classification systems have been developed. The decision to maintain the older classifications is based on a comparison of the two methods, and concluded that the older method was similar or even more protective than the classifications generated using the MnRAM. A project applicant, however, can request a change in the classification by appealing the previous classification. The applicant, however, must demonstrate that the current classification is not accurate. This will require submittal of a request to change the classification, and will use the recommended functions and values assessment method in place at the time of the appeal.

For the purposes of the Plan, the protection standards associated with the Protection, Improvement, and Management will remain in effect. If the appeal to accept the MnRAM classification is approved, the standards and requirements will still be used based on the current three class system. Table 9 shows the conversion to be used from MnRAM –derived management class to the Plan management class.

Table 9 Functional Classification Conversion Chart	
MnRAM Classification	Plan Classification
Preserve	Protection
Manage 1	Improvement
Manage 2	Management
Manage 3	Management II

6.3.3 Amendments to Policies, Strategies, and Standards

Revision to the plan, policies, and goals require additional review and approval. Amendment requests can be made by any individual, and will initially be reviewed by City staff, which will make a decision as to the completeness and validity of the request. Staff will reply within 30-60 days of a written request to amend the plan, and can respond in one of three ways:

1. Reject the amendment. Staff will reject the amendment if the request reduces, or has the potential to reduce, the Plan's ability to achieve the goals and policies of the Plan, or will result in the Plan no longer being consistent with one or more of the watershed district's plans.
2. Accept the amendment as a minor issue, with minor issues collectively added to the plan at a later date. These changes will generally be clarifications of plan provisions or to incorporate new information available after the adoption of the 2006 Plan. Minor changes will generally be evaluated on the potential of the request to help staff better implement and achieve the goals and policies the Plan. Minor issues will not result in formal amendments but will be tracked and incorporated formally into the Plan at the time any major changes are approved. Adjustments to maintain consistency between the Wetland Plan and other city Plans (i.e. the Surface Water Management Plan, Natural Resources Management Plan) shall be considered minor issues.
3. Accept the amendment as a major issue, with major issues requiring an immediate amendment. In acting on an amendment request, staff should recommend to the City Council whether or not a public hearing is warranted. In general, any requests for changes to the goals and policies or the development standards established in the Plan will be considered major amendments.

Staff will make every attempt to respond to the request within 30-60 days of receiving sufficient information from the requestor. The timeframe will allow staff to evaluate the request internally and gather input from the WD/WMOs and other technical resources, as needed. The response will describe the staff recommendation and which of the three categories the request falls into. The response will also outline the schedule for actions, if actions are needed to complete the requested amendment.

All proposed major amendments must be reviewed and approved by the appropriate Watershed Management Organizations and Water Districts prior to final adoption of the amendments. Staff will review the proposed amendments with the WD/WMOs to determine if the change is a major amendment and if determined to be major amendment, then will assess the ability of the requested amendment to maintain consistency with WD/WMO plans.

Major amendments and the need for a public hearing will be determined by staff. The requestor will be given an opportunity to present the basis for, and intended outcomes of, the request at a public hearing and will be notified of the dates of all official actions relating to the request.

The initiation of a public hearing will allow for public input or input based on public interest in the requested amendment. Council, with staff recommendations, will determine when the public hearing should occur in the process. Consistent with other formal Council actions and based on the public hearing, Council would adopt the amendment(s), deny the amendment(s) or take other action.

Appendix A

Figures

Figure 1 – City Location Map

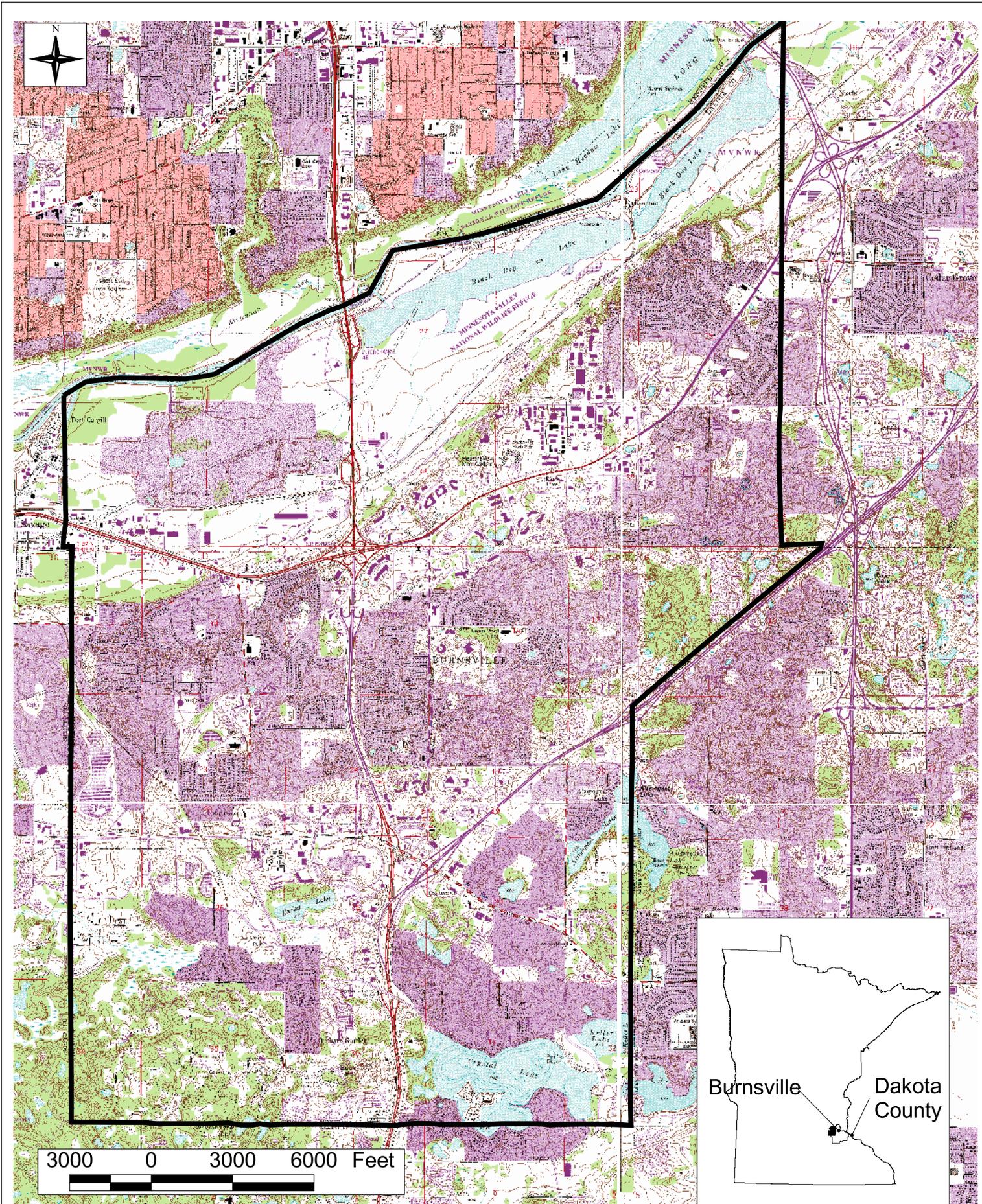
Figure 2 – Watershed Boundaries

Figure 3 – Public Waters Inventory

Figure 4 – National Wetlands Inventory

Figure 5 – Wetland Inventory, Management Classification, and
Potential Wetland Restoration/Creation Areas*

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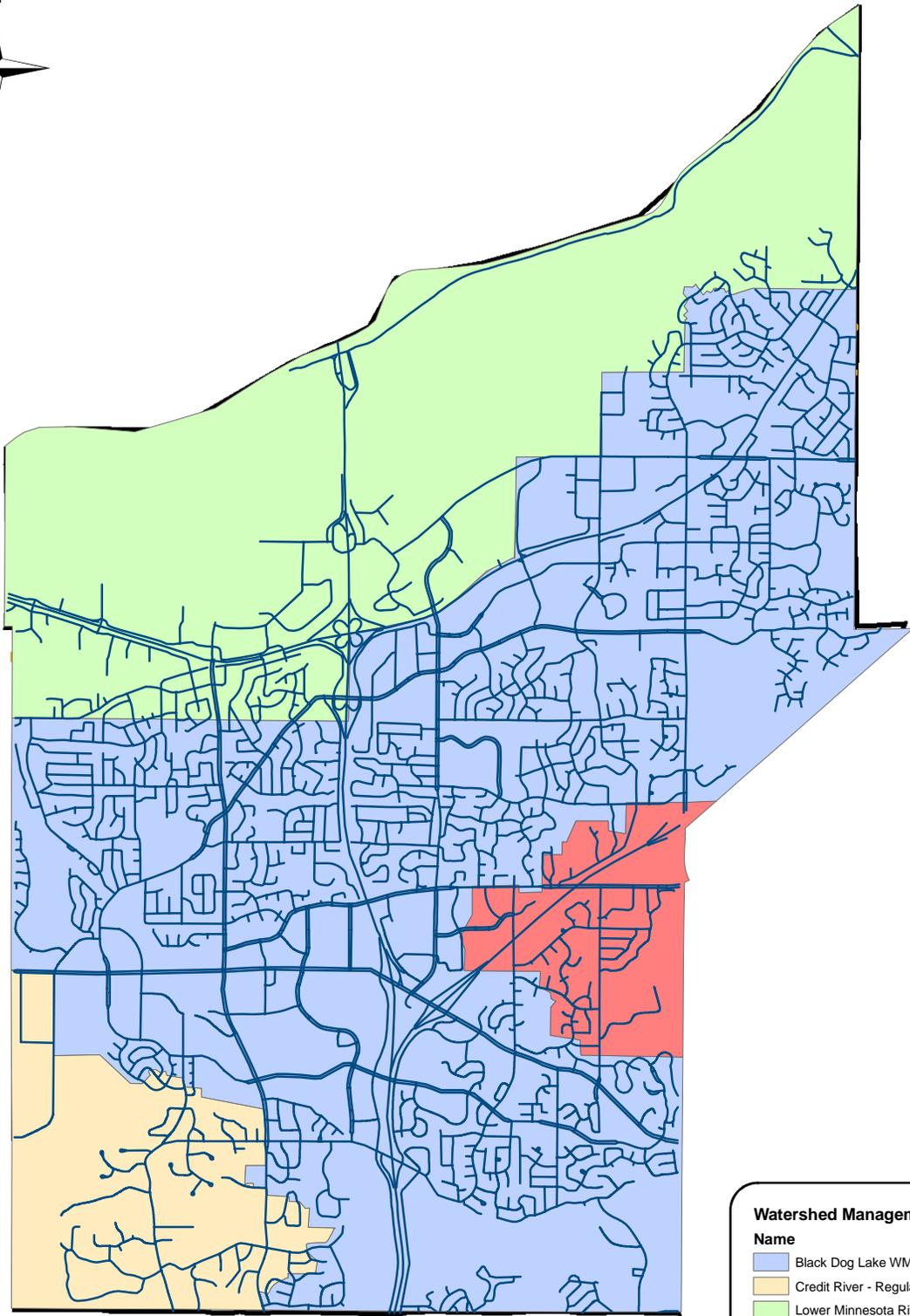


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City of Burnsville USGS Topographic Map

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Figure 1



Watershed Management Boundaries
Name

- Black Dog Lake WMO
- Credit River - Regulated by Black Dog WMO
- Lower Minnesota River Watershed District
- Vermillion River Watershed District

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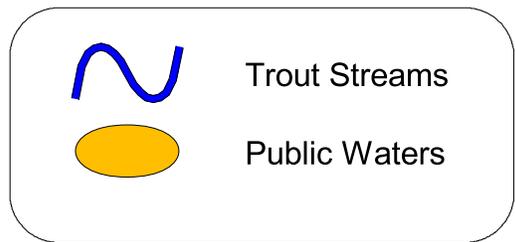
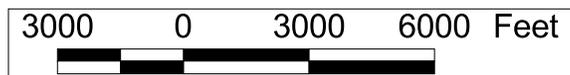
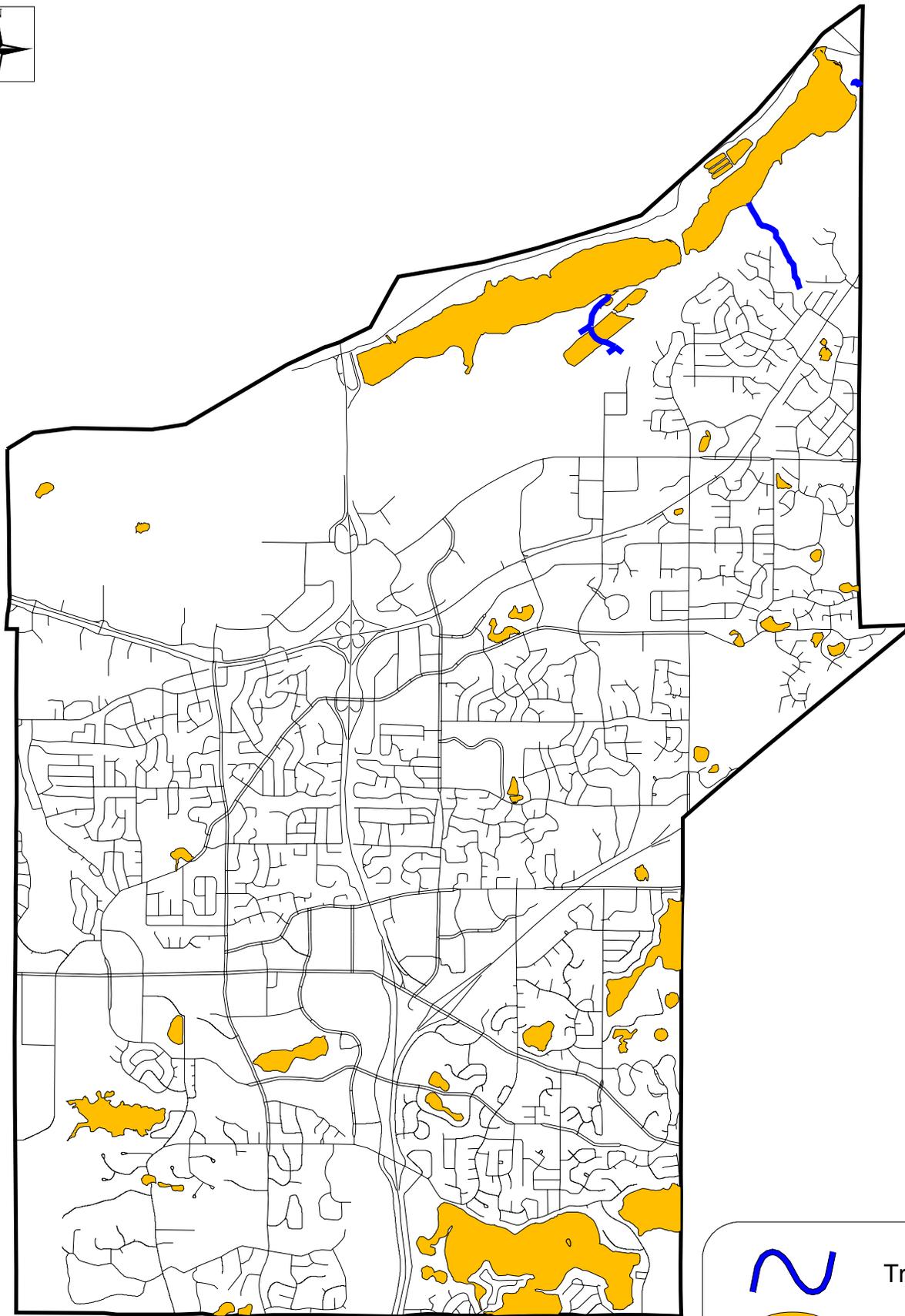


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City of Burnsville Watershed Management Organizations

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Figure 2

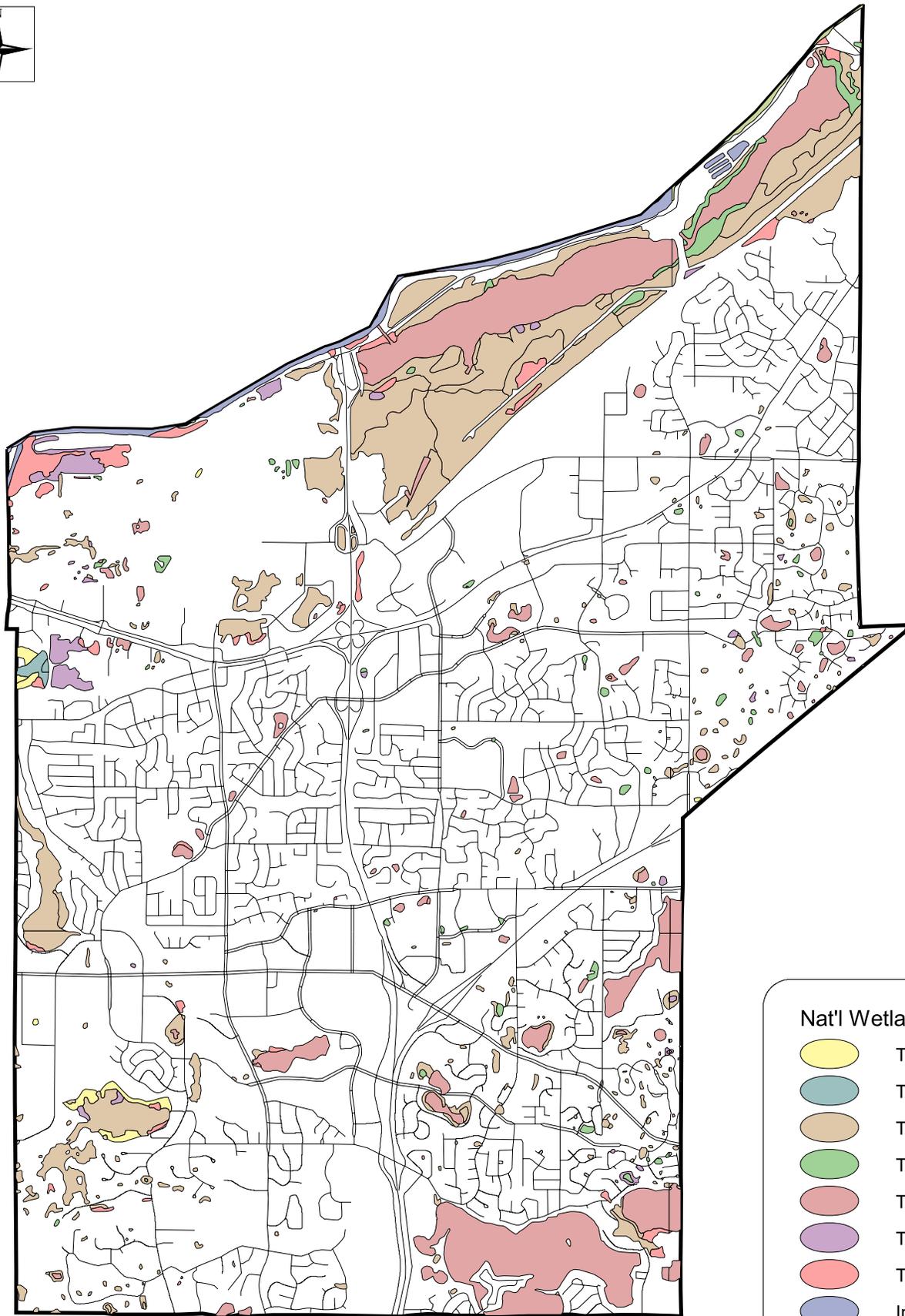


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City of Burnsville Public Waters and Trout Streams

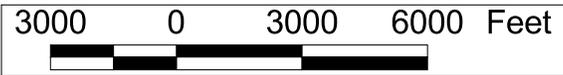
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Figure 3



Nat'l Wetlands Inventory

-  Type 1
-  Type 2
-  Type 3
-  Type 4
-  Type 5
-  Type 6
-  Type 7
-  Industrial
-  Riverine



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City of Burnsville National Wetlands Inventory

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Figure 4

Appendix B

Acronyms and Glossary

Acronyms

BDWMO	Black Dog Watershed Management Organization
BWSR	Minnesota Board of Water and Soil Resources
MNDNR	Department of Natural Resources
GIS	Geographic Information System
GPS	Global Positioning System
LMRWD	Lower Minnesota River Watershed District
MnRAM	Minnesota Routine Assessment Method
MPCA	Minnesota Pollution Control Agency
SCWMO	Scott County Watershed Management Organization
SWCD	Soil and Water Conservation District
SWMP	Surface Water Management Plan
USACE	United States Army Corps of Engineers
VRWJPO	Vermillion River Watershed Joint Powers Organization
WCA	Minnesota Wetland Conservation Act
WHEP	Wetlands Health Evaluation Program
WPMP	Wetland Protection and Management Plan
WD	Watershed District
WMO	Watershed Management Organization

Glossary

Agricultural Land: Any land designated specifically for agricultural production. This may include row crops, pasture, hayland, orchards, or land used for horticultural purposes

Army Corps of Engineers (USACE): The United States Army Corps of Engineers is a regulatory agency involved in design, permitting and construction projects related to or impacting navigable waters of the United States including lakes, waterways and wetlands.

Best Management Practice (BMP): A combination of land use, conservation practices, and management techniques, which when applied to a unit of land will result in the opportunity for a reasonable economic return with an acceptable level of water quality or water quantity improvements.

Bluff: A natural topographic feature such as a hill, cliff, or embankment having the following characteristics: (1) The slope rises at least 25 feet above the toe of the bluff; and (2) The grade of the slope from the toe of the bluff to a point 25 feet or more above the toe of the bluff averages 30 percent or greater; and (3) An area with an average slope of less than 18 percent over a distance for 50 feet or more shall not be considered part of the bluff.

Buffer: The use of land, topography, difference in elevation, space, fences, or vegetation to screen or partially screen a use or property from the vision of another use or property, and thus reduce undesirable influences such as: sight, noise, dust, and other external effects. Also defined as area immediately adjacent to a wetland that is unmowed and/or unmanaged. Buffers are ideally dominated by native vegetation and add to the ecological health of the wetland by adding habitat and assisting and filtering pollutants from surface water runoff.

Buffer Strip: An area of vegetated ground cover abutting a water body that is intended to filter sediment or other pollutants from runoff.

BWSR: Board of Water and Soil Resources. This is the lead regulatory agency that oversees the Wetland Conservation Act in the State of Minnesota.

Circular 39: Wetland classification system developed by United States Fish and Wildlife Service in 1956 that categorizes wetlands in Minnesota into eight types. This is the same classification system generally accepted by the State of Minnesota for wetland classification.

Comprehensive Plan: As defined in Minnesota Statutes 394.21, the policies, statements, goals and interrelated plans for private and public land and water use, transportation and community facilities that guide future development (and growth).

Cowardin Classification: Wetland classification system developed by the United States Fish and Wildlife Service in 1979. This system defines wetlands by a tiered system and is more detailed than the Circular 39 method. The Cowardin System is the classification System used in the National Wetlands Inventory.

Detention: The temporary storage of runoff from rainfall and snowmelt events to control peak discharge rates and provide an opportunity for physical, chemical and biological treatment to occur.

Development: The construction, installation or alteration of any structure, the extraction, clearing or other alteration of terrestrial or aquatic vegetation, land or the course, current or cross section of any water body or water course or division of land into two (2) or more parcels. See also re-development, new development and existing development.

Draining: The removal of surface water or ground water from land.

Easement: A grant of one or more property rights by a property owner for use by the public, a corporation, or another person or entity.

Erosion: The wearing away of land surface and soil by the action of natural elements (wind and/or water).

Eutrophication: Process by which overabundance of nutrients in a waterbody lead to accelerated productivity and general decrease in water clarity and quality.

Existing Development: A property or parcel of land that has previously been subject to development, and that is not undeveloped property.

Exotic Species or Invasive Species: Non-native plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

Flood: A temporary rise in stream flow or stage that results in inundation of the areas adjacent to the channel or water body.

Flood Frequency: The average frequency, statistically determined, for which it is expected that a specific flood stage or discharge may be equaled or exceeded.

Floodplain: Floodplains are lowland areas adjoining lakes, wetlands, and rivers that are susceptible to inundation of water during a flood. For regulatory purposes, the floodplain is the area covered by the 100-year flood and it is usually divided into districts called the floodway and flood fringe. Areas where floodway and flood fringe have not been determined are called approximate study areas or general floodplain.

Floodplain Forest: Wooded area adjacent to stream or river that is periodically flooded. Within this plan, floodplain forests have been specifically identified as a separate wetland category due to their unique ecology and protection needs.

Floodway: The floodway is the channel of a river or other watercourse and the adjacent land areas which must remain open in order to discharge the 100-year flood.

Forbs: Vegetation that is not a tree, grass or shrub. Usually associated with flowering plants.

Geographic Information System (GIS): Computer database of georeferenced information on the City's various resources.

Global Positioning System (GPS): Network of satellites used to map and identify locations on the earth. Data is used with a portable datalogger called a GPS Unit

Hydric Soil: Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

Hydrophytic Vegetation: Macrophytic plant life growing in water, soil, or a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Impervious Surface: The portion of the buildable parcel which has a covering which does not permit water to percolate into the natural soil. Impervious surface shall include, but not be limited to, buildings, all driveways and parking areas (whether paved or not), sidewalks, patios, swimming pools, tennis and basketball courts, covered decks, porches, and other structures. Open, uncovered decks are not considered impervious for the purposes of this ordinance. The use of patio blocks, paver bricks or class 5 gravel material are considered impervious surfaces as a majority of water runs-off the surface rather than being absorbed into natural soils underneath. Some exceptions to these conditions may include paver blocks or pavement systems engineered to be permeable with the underlying soils suitable for infiltration.

Infiltration Basin: An impoundment where incoming storm water runoff is stored until it gradually infiltrates into and through the soil of the basin floor.

Infrastructure: Public facilities and services, including transportation, storm water pipes, structures and ponds, water and sewer pipes and structures, telecommunications, recycling and solid waste disposal, parks and other public spaces, schools, police and fire protection, and health and welfare services.

Invasive Species or Exotic Species: Non-native plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

Local Government Unit (LGU): Agency that has the primary responsibility of administering the Wetland Conservation Act. The City of Burnsville acts as LGU for all wetlands within the City limits and shares responsibility for basins that border adjacent municipalities.

Mesotrophic: Describes a lake of moderate photosynthetic productivity.

MNRAM: The Minnesota Routine Assessment Method as referenced by Minnesota Rules 8420. MNRAM is the primary tool used to assess wetland functions and values on a qualitative basis. The MNRAM evaluates wetlands based on vegetation, wildlife habitat, water quality, flood and storm water attenuation, recreational opportunities, aesthetics, fishery habitat, groundwater interactions, and commercial use. The version referenced in this plan is Version 3.0.

Monotypic: Used to describe vegetation communities in which only one species is present. Most often used to describe areas that are entirely dominated by reed canary grass or cattails.

Navigable Waters. Waters defined by the United States, 33 Code of Federal Regulations Section 329.4 as those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

New Development: Development of a property or portion thereof that is currently undeveloped property.

Ordinary High Water Level (OHWL or OHW): The boundary of public waters and wetlands, and shall be an elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the ordinary high water level is the elevation of the top of the bank of the channel. For reservoirs and flowage, the ordinary high water level is the operating elevation of the normal summer pool. In Burnsville all of the lakes have an OHW established. For streams and waterways, the OHW is considered the top of bank. Areas below the OHW are under the jurisdiction of the Minnesota Department of Natural Resources and are not regulated by the Wetland Conservation Act.

Protected Water: Any water or wetland designated by the Minnesota Department of Natural Resources and identified by statute on the Protected Waters Inventory.

Public Waters: Those waters of the state identified as public waters or wetlands under Minnesota Statutes, Section 103G.005.

Reach: A hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by the natural or man-made obstruction. In an urban area, the segment of a stream or river between two (2) consecutive bridge crossings would most typically constitute a reach.

Redevelopment: Any development including but not limited to rebuilding, renovation, revision, remodel, reconstruction or redesign of or at an existing development.

Riprap: A combination of large stone, cobbles and boulders used to line channels, stabilize banks, reduce runoff velocities, or filter out sediment.

Runoff (Storm Water): The overland and near surface flow from storm water and snowmelt.

Runoff Conveyance: Methods for safely conveying runoff to a BMP to minimize disruption of the stream network, and promote infiltration or filtering of the runoff.

Sequencing: The process used by the Local Government Unit to evaluate the necessity of an activity impacting a wetland. The party proposing the impact must demonstrate that the activity proposed complies with the following principles in descending order of priority.

Avoids direct or indirect impacts to the wetlands that may diminish or destroy them;

Minimizes the impact to the wetland by limiting the degree or magnitude of the wetland activity and its implementation;

Rectifies the impacts by repairing, rehabilitating, or restoring the affected wetland;

Reduces or eliminates the impact to the wetland over time by preservation and maintenance operations; and,

Replaces unavoidable wetland impacts to the wetland by restoring or, if wetland restoration opportunities are not reasonably available, creating substitute wetland areas having equal or greater public value as provided for under the Wetland Conservation Act.

Shoreland: Land located within the following distances from public waters: one thousand feet (1,000') from the ordinary high water level of a lake, pond, or flowage; and three hundred feet (300') from a river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater. The limits of shoreland may be reduced whenever the waters involved are bounded by topographic divides which extend landward from the waters for lesser distances and when approved by the Commissioner of the DNR.

Storm Water Treatment: Detention, retention, filtering or infiltration of a given volume of storm water to remove pollutants.

Shoreland Wetland Protection Zone: The land located within 1,000 feet from the Ordinary High Water Elevation of a Protected Water, 500 feet from the Minnesota River or the landward extent of the designated floodplain, and 300 feet from any stream designated in the shoreline management ordinance.

Storm Water: (See Runoff)

Storm Water Treatment Pond: Any waterbody that has been specifically created to remove sediment and nutrients and “treat” surface water runoff. Storm water ponds that were created from existing wetland are still regulated as wetlands. Storm water ponds created from upland areas are not wetland and are exempt from regulatory jurisdiction.

Subwatershed: A subdivision based on hydrology corresponding to a smaller drainage area within a larger watershed.

Technical Evaluation Panel (TEP): A panel of technical professionals from the Board of Water and Soil resources, Carver or Hennepin County Conservation Districts, and a Minnesota Department of Natural Resources representative. Additional members can also be invited, including the U.S. Army Corps of Engineers. The TEP provides decision making support for the LGU for many wetland and regulatory issues.

Upland: General term to describe any area that is not a wetland.

Vegetated Filter Strip: A vegetated section of land designed to accept runoff as overland sheet flow from upstream development. It may adopt any natural vegetated form, from grassy meadow to small forest. The dense vegetative cover facilitates pollutant removal. A filter strip cannot treat high velocity flows; therefore, they have generally been recommended for use in agriculture and low-density development. A filter strip can also be an enhanced natural buffer, whereby the removal capability of the natural buffer is improved through engineering and maintenance activities such as land grading or the installation of a level spreader. A filter strip differs from a grassed swale in that a swale is a concave vegetated conveyance system, whereas a filter strip has a fairly level surface.

Watershed: A topographically defined area within which all runoff water drains to a point.

Wetland: Transitional land between terrestrial and aquatic systems where the water table is at or near the surface or the land is covered by shallow water. For purposes of the plan, wetlands must have a predominance of hydric soil, be inundated or saturated to the surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soils; and under normal circumstances supports a prevalence of hydrophytic vegetation.

Wetland Conservation Act (WCA): In 1991 Minnesota adopted the initial Wetland Conservation Act (Minnesota Laws Chapter 354) to protect the states wetland resources. This act has been amended and updated periodically, but is used by reference to the current program, and any future amendments.

Wetland Delineation: The process and procedure by which an area is adjudged a wetland or non-wetland including a determination of the wetland boundary based on the point where the non-wetland areas shift to wetlands or aquatic habitats.

Wetland Mitigation: Wetlands created to replace wetland areas destroyed or impacted by land disturbances.

Wet Pond: A conventional wet pond has a permanent pool of water for treating incoming storm water runoff and a live storage component for flood storage and additional water quality treatment detention (see typical cross section in Appendix D).

Appendix C

Literature Review and Website Links

Literature Review

1. Black Dog Watershed Management Organization. 2002. *Watershed Management Plan*
2. Burnsville, City of, Comprehensive Wetland Protection and Management Plan, 1997.
3. Cowardin, L.M., V. Carter, F.C. Golet, R.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS079/31, 103 pp.
4. Eggers, S.D. & D.M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota & Wisconsin. 2nd edition. US Army Corps of Engineers, St. Paul.
5. Lower Minnesota River Watershed District. 1999. *Lower Minnesota River Watershed District Water Management Plan*.
6. Minnesota County Biological Survey Map Series No. 16. Dakota County, Minnesota. 1997.
7. Minnesota Department of Natural Resources Protected Waters and Wetlands Inventory Map, Dakota County, Electronic format.
8. Scott County Comprehensive Water Resource Management Plan, 1994.
9. Shaw, S. and C.G. Fredine. 1956. Wetlands of the United States Circular 39. U.S. Fish and Wildlife Service. U.S. Government Printing Office, Washington, D.C.
10. *Storm -Water and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Storm-Water and Snow-Melt Runoff on Wetlands, State of Minnesota*. Storm-Water Advisory Group, June, 1997
11. U.S. Army Corps of Engineers, 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Waterways Experiment Station, Vicksburg, Mississippi.
12. U.S. Department of the Interior, 1988. National List of Plant Species that Occur in Wetlands: North Central (Region 3). Biological Report 88 (26.3), Fish and Wildlife Service. In cooperation with the National and Regional Interagency Review Panels. Washington, D.C.
13. U.S. Fish and Wildlife Service. 1984. Comprehensive Plan, Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail. U.S. Dept. of the Interior. 187 p.
14. U.S. Fish and Wildlife Service. 2004. Minnesota Valley National Wildlife Refuge and Wetland Management District Comprehensive Conservation Plan. U.S. Dept. of the Interior.
15. Vermillion River Watershed Joint Powers Organization. 2006. Draft Standards

Water Management Agency/Organization Contacts

Numerous agencies and organizations in Minnesota have varying authorities and/or interest in surface water management activities relative to the City's Plan. A summary of these agencies and organizations is listed below with a link to their respective website at the time this Plan was created. More detailed information is available on each web page including contacts and key responsibilities relative to surface water management.

Agency/Organization

Website Link

State

MN Pollution Control Agency

<http://www.pca.state.mn.us>

MN Department of Natural Resources

<http://www.dnr.state.mn.us>

Board of Water and Soil Resources

<http://www.bwsr.state.mn.us>

Local

City of Burnsville

<http://www.ci.burnsville.mn.us>

Carver County WMO

<http://www.co.carver.mn.us/water>

Dakota County

<http://www.co.dakota.mn.us>

Dakota County SWCD

<http://dakotacountyswcd.org>

Scott County WMO

<http://www.co.scott.mn.us>

Watersheds

Black Dog WMO

<http://dakotacountyswcd.org/watersheds/blackdogwmo/>

Lower Minnesota River WD

<http://www.watersheddistrict.org>

Vermillion River JPO

<http://www.co.dakota.mn.us/CountyGovernment/PublicEntities/VermillionJPO/default.htm>

Federal

U.S. Army Corps of Engineers

<http://www.mvp.usace.army.mil>

U.S. Environmental Protection Agency

<http://www.epa.gov/>

Natural Resources Conservation Service

<http://www.nrcs.usda.gov>

Appendix D

Summary Of MNRAM 3.0 Methods And Classifications

Currently, most wetland functions and values assessment are completed using the most recent version of MnRAM, which is version 3.0. While the same functions and values are measured, the current version specifically measures the following functional criteria:

The functional criteria that are evaluated in the MnRAM are:

- Maintenance of Characteristic Vegetative Diversity/Integrity
- Maintenance of Hydrologic Regime
- Flood/Storm water Attenuation
- Downstream Water Quality
- Maintenance of Wetland Water Quality
- Shoreline Protection
- Maintenance of Characteristic Wildlife Habitat Structure
- Maintenance of Characteristic Fish Habitat
- Maintenance of Characteristic Amphibian Habitat
- Aesthetics/Recreation/Education/Cultural
- Commercial Uses
- Ground Water Interaction

Additional Evaluation Information

- Restoration Potential
- Sensitivity to Storm Water & Urban Development
- Additional Storm Water Treatment Needs

As described in the functions and values section, the official inventory classifications will remain Protection, Improvement, and Management, even though more current classification systems have been developed. The decision to maintain the older classifications is based on a comparison of the two methods, and concluded that the older method was similar or even more protective than the classifications generated using the MnRAM. A project applicant, however, can request a change in the classification by appealing the previous classification. The process to request an appeal is described in Section 4 Part D. The applicant, however, must demonstrate that the current classification is not accurate. This will require submittal of a request to change the classification, and will use the current system, which is the MnRAM.

For the purposes of the Plan, the protection standards associated with the Protection, Improvement, and Management will remain in effect. If the appeal to accept the MnRAM classification is approved, the standards and requirements will still be used based on the current three class system. Table 12 shows the conversion to be used from MnRAM –derived management class to the Plan management class

The remainder of this appendix describes the MnRAM-derived classification system and how it compares to the Plan classification.

The Board of Water and Soil Resources (BWSR) has established recommended guidelines for classifying and managing wetlands based on the result of the MnRAM analysis. The BWSR guidelines provide two classification standards based on wetland recommendations and in compliance with the WCA, state water quality standards, and multiple wetland management plans. Suggested classifications are either Basic Protection or Increased Protection, with the local authority determining which level of protection is most appropriate. Both standards are illustrated in the following flowcharts, although the City has selected to use the Basic Protection Standard. The Increased Protection Standard will remain for reference purposes, and may be used as an alternative if an additional level of protection is warranted.

The Basic Protection Standard is the minimum recommended to satisfy no net loss goals, protect critical resources, and allow for use of some wetlands in developing areas. The increased Protection Standard will include more wetlands in the Preserve category that would otherwise be considered Manage 1. This has the net effect of protecting more wetlands with higher standards.

Using the system recommended by BWSR, each wetland will be classified into one of four categories: Preserve, Manage 1, Manage 2, or Manage 3. The Preserve category is for exceptional and highest-functioning wetlands, or those sensitive wetlands receiving conveyed storm water runoff that have yet retained a medium level of vegetative diversity/integrity. These wetlands are those that should be preserved in (or improved to) their most pristine or highest functional capacity with wide, natural buffers, in perpetuity.

In the Manage 1 category are high-quality wetlands that should be protected from development and other pressures of increased use, including indirect effects. Maintaining natural buffers will help to retain the significant function these wetlands provide. In the event that impacts to these wetlands cannot be avoided, replacement ratios for mitigation should exceed the state-required minimums. Manage 2 wetlands provide medium functional levels and the wetland extent should be maintained. These wetlands often provide optimal restoration opportunity. Manage 3 wetlands have been substantially disturbed and have the lowest functions and values.

1. Preserve

This is comparable to the Protection classification used in the Plan.

Wetlands classified as Preserve have at least one of the following characteristics.

- Are identified as Critical Resources
- Wetlands rated with exceptional vegetative diversity/integrity, which may include wetlands with natural communities not significantly impacted by invasive species or other human-induced alterations, wetlands harboring endangered or threatened plant species, or rare wetland habitats classified as imperiled (S1) or critically imperiled (S2) by the state rankings.
- Wetlands rated as exceptional for wildlife habitat. These include wetlands known to harbor endangered or threatened animal species, rare communities, or wildlife refuges and fish and wildlife management areas whose purpose is maintaining suitable habitats for wildlife.
- Wetlands rated as high for amphibian habitat.
- Wetlands rated as exceptional for fish habitat. These wetlands include those specifically managed for fish management; designated trout streams, lakes or adjacent wetlands; and known spawning habitat for game fish.

-
- Wetlands rated high for shoreline protection. Wide wetlands bordering lakes and feeder streams that have persistent, emergent, submergent, or floating-leaved vegetation are critical to protecting the water quality of the lakes from bank erosion and sedimentation from upstream.
 - Wetlands rated exceptional for aesthetics/education/recreation/cultural and rated high for wildlife habitat, include those located on public lands that provide a unique or rare recreational, educational, or cultural opportunity, and have high functional level for wildlife since that is typically a primary focus for users.
 - Wetlands that are exceptionally sensitive to storm water impacts and have a vegetative diversity/integrity rating of medium or higher were also placed in this category. These wetlands may have suffered some degradation from human influences due to their heightened sensitivity. The vegetative quality of the wetland is such that improved management may allow for restoration of the community.
 - Wetlands with a high vegetative diversity/integrity rating and a high rating for wetland water quality. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning to maintain water quality, which is critical to wetland sustainability.
 - Wetlands with a high vegetative diversity/integrity rating and a high rating for hydrologic regime. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability.

2. Manage – 1

This classification is comparable to the Improvement class in the Plan

Wetlands classified as Manage 1 have at least one of the following characteristics:

- Wetlands rated with high vegetative diversity/integrity, which typically include diverse wetland plant communities with less than 20 percent cover of non-native or invasive species.
- Wetlands rated as high for wildlife habitat. These generally include wetlands located within large tracts of undeveloped land or in parks, which allow for wide high quality upland buffers. In addition, this includes seasonal wetlands that are well buffered.
- Wetlands rated as medium for amphibian habitat. This includes seasonal wetlands that are well buffered.
- Wetlands rated as high for fish habitat. These wetlands are lacustrine/riverine or are contiguous with a permanent waterbody or watercourse and provide spawning/nursery habitat, or refuge for native fish species in adjacent lakes, rivers or streams.
- Wetlands rated medium for shoreline protection. These wetlands include those that are moderately wide and support persistent emergent, submergent, or floating-leaved vegetative cover bordering lakes and feeder streams.
- Wetlands rated high for aesthetics/education/recreation/cultural and medium for wildlife habitat, include those that provide a number of benefits that may include: spatial buffering, accessibility, public ownership, multiple recreational opportunities, and medium-quality wildlife habitat.
- Wetlands which are highly sensitive to storm water impacts and have a vegetative diversity/integrity rating of medium or high. The vegetative quality of the wetland is such that improved management may allow for restoration of the community.

-
- Wetlands with a medium vegetative diversity/integrity rating and a high rating for wetland water quality. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for water quality, which is critical to wetland sustainability. These wetlands would likely benefit from active management.
 - Wetlands with a medium vegetative diversity/integrity rating and a high rating for hydrologic regime were placed in the Manage 1 category. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability. These wetlands would likely benefit from active management.
 - Wetlands rated high for commercial use. These wetlands provide important social value without having an altered hydrology.

3. Manage – 2

This is comparable to the Protection classification used in the Plan.

Wetlands classified as Manage 2 have at least one of the following characteristics:

- Wetlands rated with medium vegetative diversity/integrity, which typically include wetlands with less diversity and up to 50 percent cover of non-native or invasive species.
- Wetlands rated as medium for wildlife habitat. These often include wetlands that are increasingly separated from natural communities and wildlife corridors; they often lack significant upland buffers and are increasingly altered.
- Wetlands rated as low for amphibian habitat. These wetlands are increasingly altered, but they still have some opportunity to provide either breeding, over wintering, or resting habitat for amphibians.
- Wetlands rated as medium for fish habitat. These wetlands include those which are intermittently connected to waterbodies supporting native fish populations
- Wetlands rated low for shoreline protection. While these wetlands are not providing the highest level of protection to the lake or river systems, their mere presence provides some level of protection that should not be dismissed. These wetlands are typically narrow, with little emergent, submergent, or floating-leaved vegetation.
- Wetlands rated Medium for aesthetics/education/recreation/cultural and Low for wildlife habitat.

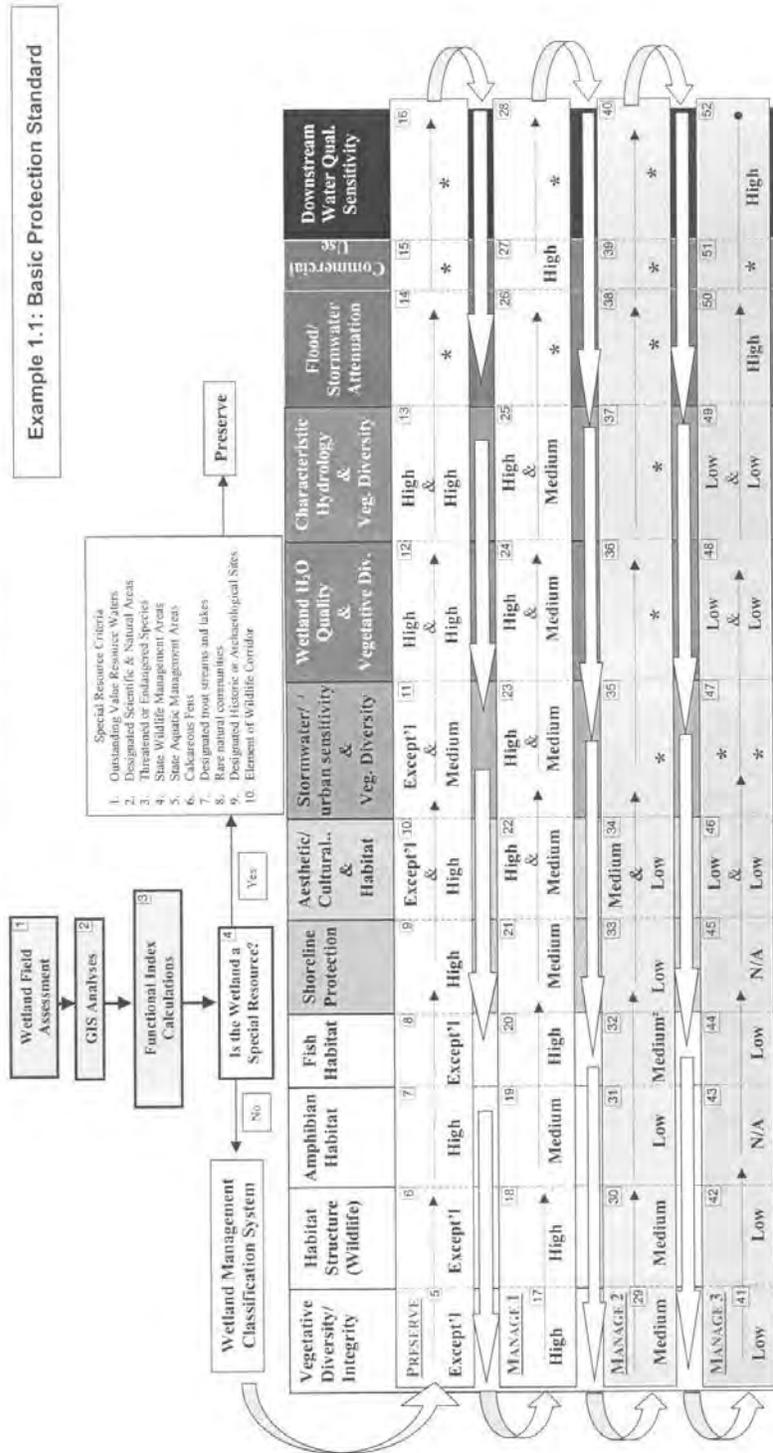
4. Manage – 3

Wetlands classified as Manage 3 include all of the remaining wetlands that did not fit into any of the above-described conditions. All of these wetlands would rate low for vegetative diversity/integrity. Many of these wetlands rate medium or high for downstream water quality protection and for flood storage/attenuation. This correlation is expected since wetlands that provide higher levels of water quality treatment and runoff/rate control often suffer from ecological degradation.

Flow Sheets used to identify the MnRAM-derived management classification are included on the following pages.

Figure 1.1
Wetland Management Classification Process Flowchart for Basic Wetland Protection

Each wetland will be ranked into a Wetland Management group by the highest rated function for the wetland. Follow the arrows through numbered boxes in progression through the tables; classify wetlands into the first group that applies.

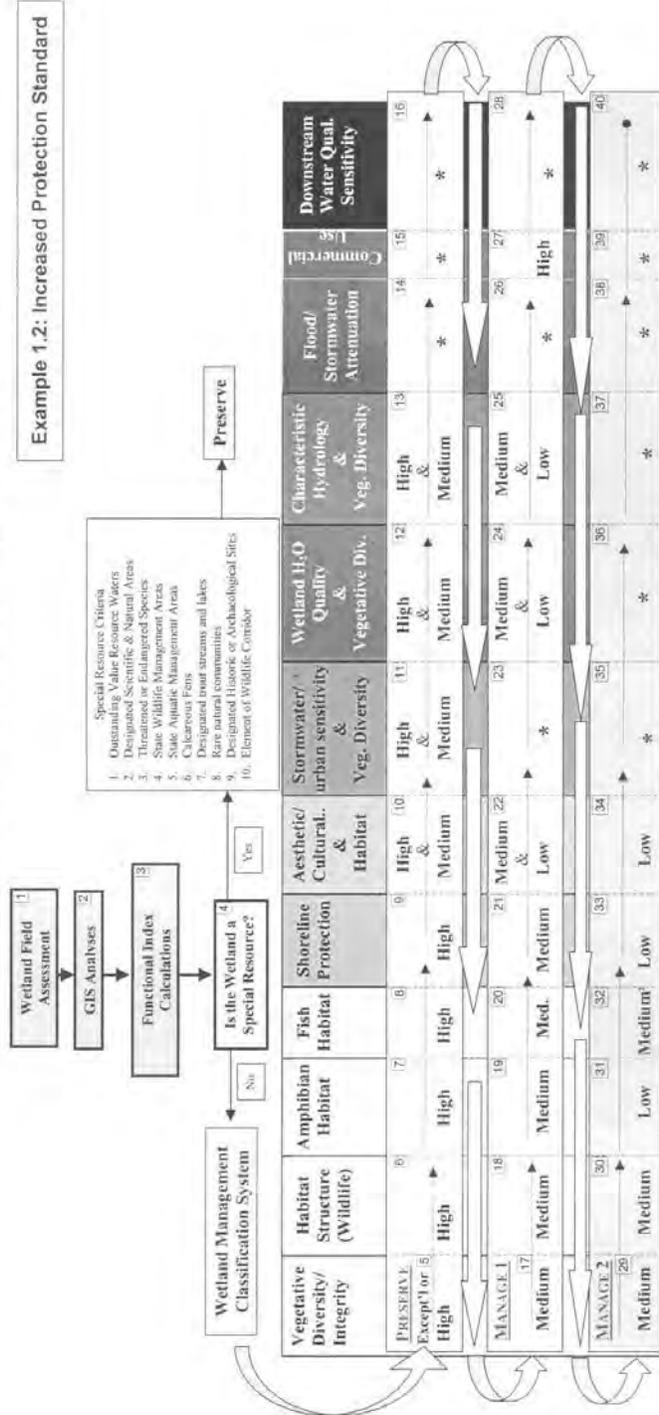


* This rating does not apply here.

¹ For types as shown in Table 1.2.
F:\Resources & References\WetlandManagement Classification\WetlandManagement Classification\MnRAM\Flowchart.DOC

Figure 1.2
Wetland Management Classification Process Flowchart for Increased Wetland Protection

Each wetland will be ranked into a Wetland Management group by the highest rated function for the wetland. Follow the arrows through numbered boxes in progression through the tables; classify wetlands into the first group that applies.



¹ For types as shown in Table 1.2.

² This rating does not apply here.

Appendix E

Summary of Wetland Protection and Management Policies

Summary of Proposed Wetland Management Categories and Strategies

Management Class	Management Strategy	Storm Water Treatment	Minimum Buffer	Mitigation Standard	Hydrologic Guidelines
Protection	Maintain wetland and existing functions, values and wildlife habitat. Possible need for active management of wetland to protect unique features. Apply strict avoidance standards. May be appropriate to develop a conservation easement.	New Development - Treatment to 90% TSS removal, 60% TP removal, 1.0 inch infiltration volume where allowed Redevelopment - Treatment to 70% TSS removal, 30% TP removal, 0.5 inch infiltration volume where allowed	50 feet Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio with documented replacement of functions/values. Consider requiring buffer replacement. Emphasis on replacement within watershed	If isolated or currently not receiving storm water: Maintain existing hydrology—divert increased flows. If flow-through or currently receiving discharge <u>Bounce (10 yr):</u> Existing + 6” <u>Inundation (1 & 2 yr):</u> Existing plus 1 days <u>(10 yr):</u> Existing plus 3 days <u>Outlet Control:</u> ³ No Change
Improvement	Maintain wetland without degrading existing functions, values and wildlife habitat. Apply WCA sequencing process.	Rate controls - no increase from existing conditions for 1 or 2, 10 and 100 year events Storm water modeling needed if more than 5,000 square feet of new impervious or more than one half acre disturbed	35 feet Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio. Emphasis on replacement of functions and values on-site	<u>Bounce (10 yr):</u> Existing + 9” <u>Inundation (1 & 2 yr):</u> Existing plus 3 days <u>(10 yr):</u> Existing + 5 days <u>Outlet Control:</u> ² No Change
Management	Maintain wetland footprint. Improve wetland biological and plant community diversity/integrity or enhance other functions if possible. Apply WCA sequencing process. Consider for restoration. Consider sequencing flexibility with justification	See Water Resources Management Plan for more detailed design criteria	25 feet Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio. Emphasis on replacement of functions and values on site if possible. Allow sequencing flexibility if MnRAM 3.0 data supports Manage 3 Classification	<u>Bounce (10 yr):</u> Existing + 12” <u>Inundation (1 & 2 yr):</u> Existing plus 5 days <u>(10 yr):</u> Existing + 15 days <u>Outlet Control:</u> ² 0 to 2.0 ft above existing outlet
Management II	Maintain storm water treatment	Pretreatment required, minimum of grit removal, required to existing storm water ponds that have capacity for the contributing area	20 feet	May be subject to WCA, Allow sequencing flexibility	See Water Resources Management Plan for more detailed design criteria

Legend



Stormwater Features (139)

2006 Wetland Inventory

Burnsville Classification



Protection (64)



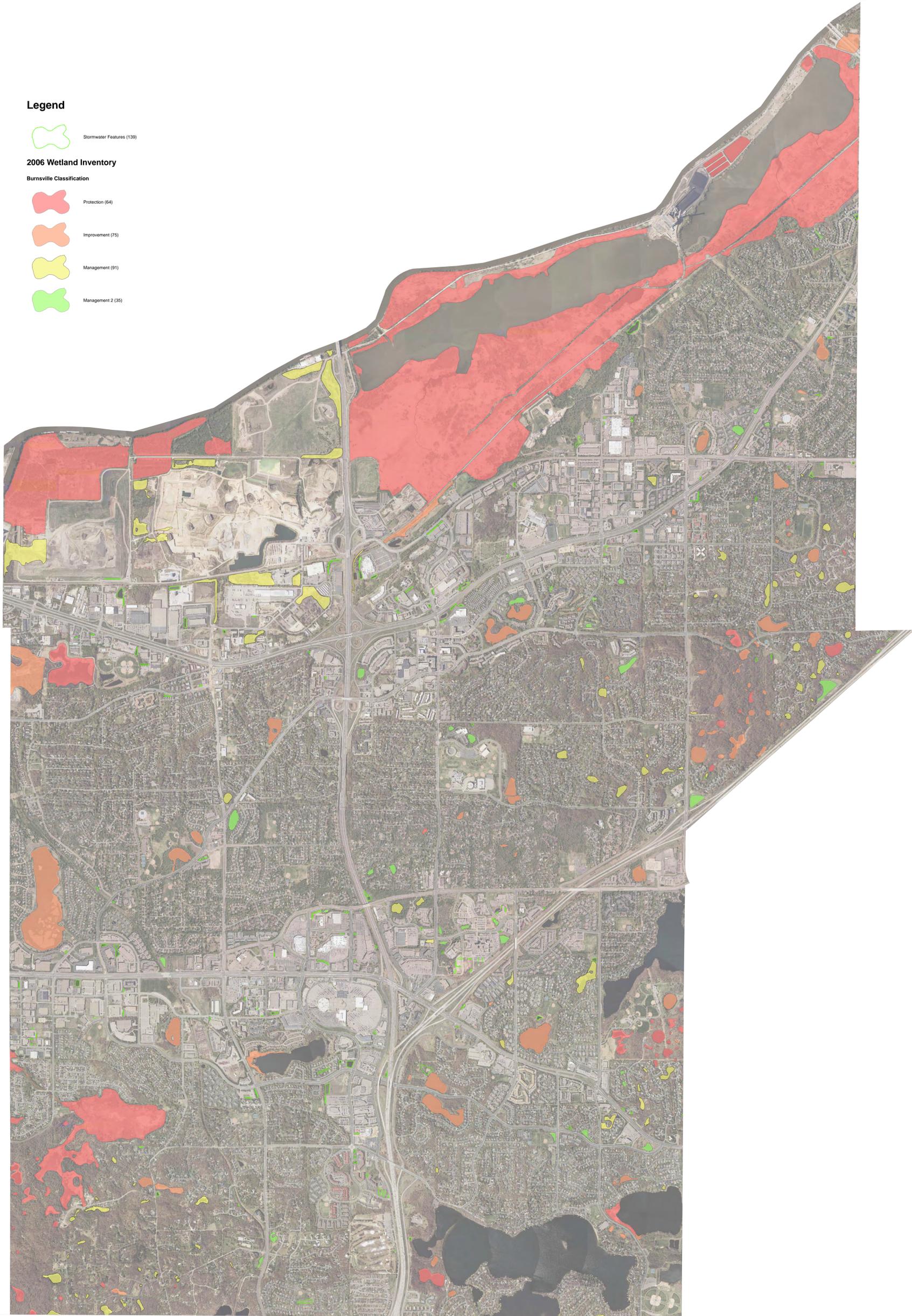
Improvement (75)



Management (91)



Management 2 (35)



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Project: BURNS 135090
Print Date: 11/6/2017
Map by:
Projection: NAD 1983 UTM Zone 15N
Source:

Wetland Classification Map
Wetland Protection and Management Plan
BURNSVILLE, MINNESOTA

Figure
5