16.0 Wetlands

The wetlands in the City of Edina are an important community asset. These resources supply aesthetic and recreational benefits, in addition to providing wildlife habitat and refuge. To protect the wetlands in the City of Edina, a goal of no net loss of wetland functions and values has been adopted.

To provide a basis for wetland protection efforts, a planning-level inventory and field assessment of all the wetlands within the City was completed in 1999. The wetland inventory identified wetland location, approximate size, type, wetland classification, dominant wetland vegetation, function, and value. In 2003, the Minnehaha Creek Watershed District developed a Functional Assessment of Wetlands (FAW) to provide a comprehensive inventory and assessment of existing wetland functions within the district. The City adopts the Minnehaha Creek Watershed District FAW for portions of the city within the Minnehaha Creek Watershed. Figure 16.1 depicts the wetlands that were identified and assessed as part of these two wetland inventories, which are discussed in further detail in subsequent sections. Note that the wetlands identified within the Minnehaha Creek Watershed District are based on the 2003 FAW, and the remainder are based on the City's 1999 planning-level inventory.

16.1 City of Edina Wetlands Inventory- 1999

In order to compile detailed wetland data and assess the functions for hundreds of wetlands based on a short field visit to each wetland, a wetland assessment methodology was needed to allow for rapid assessment of wetlands while maximizing the integrity and value of the data. The most common wetland assessment methodology used in Minnesota has been the *Minnesota Routine Assessment Method for Evaluating Wetland Functions* commonly referred to as "MNRAM." A modified version of MNRAM 2.0 was used for the wetland inventory in the City of Edina, which was completed in 1999. A copy of the modified version of MNRAM 2.0 is included in Appendix D. Copies of the modified MNRAM field data sheets for each wetland have been compiled into a Wetlands Field Investigation document. The results of the wetlands inventory and assessment are provided in a geographic information system (GIS) wetlands inventory database, included as Appendix E.

16.1.1 Delineation

During the summer of 1999, a wetland inventory was conducted within the City of Edina. The inventory consisted of field inspecting each wetland in the city and mapping the approximate wetland boundary in general accordance with the routine determination method as specified in the *U.S. Army Corps of Engineers Wetlands Delineation Manual*, 1987. Existing wetland maps (MDNR Protected Waters and Wetlands maps and National Wetland Inventory (NWI) maps), Soil Conservation Service (SCS) soil survey maps, and aerial photographs were used as baseline information to assist in the identification of wetland areas.

Additionally, USFWS Cowardin and Circular 39 classifications were assigned to each wetland during field inspections.

16.1.2 Dominant Vegetation

The dominant vegetation within each wetland was characterized during the field inspection process using the modified version of MNRAM 2.0. For each wetland, the percent of the site occupied by the various vegetation communities for each stratum (open water, floating leafed community, emergent community, herbaceous community, shrub community, and tree community) were recorded, along with the dominant species present for each stratum. Where invasive and exotic species were encountered, the species and the percent areal coverage were also recorded. In addition, the plant community types and quality level were noted for each wetland.

16.1.3 Wetland Functional Assessment

The modified version of MNRAM 2.0 used for the wetland inventory in the City of Edina included a list of questions for a number of assessment categories. Those questions all measure some unique characteristic of the wetland. Each wetland functional rating was determined loosely based on the user guidance provided for each function in MNRAM 2.0. The modified version of MNRAM 2.0 assesses the wetland functions and values described below.

16.1.3.1 Hydrology

A wetland's hydrologic regime or hydroperiod is the seasonal pattern of the wetland water level which is like a hydrologic signature of each wetland type. It defines the rise and fall of a wetland's surface and subsurface water. The constancy of the seasonal patterns from year to year ensures a reasonable stability for the wetland (Mitsch and Gosselink, 2000). The ability of the wetland to maintain a hydrologic regime characteristic of the wetland type is dependent upon wetland soil and vegetation characteristics, land use within the wetland, land use within the upland watershed contributing to the wetland, and wetland inlet/outlet configuration. Maintenance of the hydrologic regime is important for maintaining a characteristic vegetative community, and is closely associated with other functions including flood attenuation, water quality and groundwater interaction. The hydrology of each wetland was rated subjectively based on the extent of hydrologic alteration. This evaluation focused primarily on the presence or absence of directed storm water, outlets, and ditching along with upland watershed characteristics.

16.1.3.2 Vegetative Diversity

The vegetative diversity rating is based primarily on the diversity of vegetation within the wetland in comparison to an undisturbed condition for that wetland type. The vegetative diversity value of each wetland was assessed and rated based loosely on the ratings in MNRAM 2.0 with additional emphasis placed on invasive species and multiple communities and vegetative strata. The results of this assessment are included in the GIS wetlands inventory database. An exceptional rating typically reflects one of the following conditions: (1) highly diverse wetlands with virtually no non-native species, (2) rare or critically impaired wetland communities in the watershed, or (3) the presence or

previous siting of rare, threatened, or endangered plant species. A high rating indicates the presence of diverse, native wetland species and a lack of non-native or invasive species. Wetlands that rate low are primarily dominated by non-native and/or invasive species.

16.1.3.3 Wildlife Habitat

The ability of a wetland to support various wildlife species is difficult to determine due to the specific requirements of the many potential wildlife species that utilize wetlands. This function determines the value of a wetland for wildlife in a more general sense, and not based on any specific species. The characteristics evaluated to determine the wildlife habitat function include: surrounding land use conditions, the interspersion of wetlands in the area, barriers to wildlife movement, rare wetland types, special habitats, and the presence of rare or listed species.

16.1.3.4 Fishery Habitat

The ability of the wetland to support fisheries is determined based on the hydrologic connectivity to a native game fishery. Wetlands without a direct hydrologic connection to a waterbody supporting fish are determined to not provide this function. Wetlands rated high are lacustrine or riverine and provide spawning/nursery habitat, or refuge for native game fish. Wetlands rated medium may support native minnow populations but not native gamefish. Low quality wetlands include those with an intermittent hydrologic connection to a waterbody with a native fishery.

16.1.3.5 Flood/Stormwater Attenuation

A wetland's ability to provide flood storage and/or flood wave attenuation is dependent on many characteristics of the wetland and contributing watershed. Characteristics of the subwatershed that affect the wetlands ability to provide flood storage and attenuation include: soil types, land use and resulting stormwater runoff volume, sediment delivery from the subwatershed, and the abundance of wetlands and waterbodies in the subwatershed. Parameters used to assess the ability of the wetlands to provide flood storage and/or flood wave attenuation included: flood/stormwater management levels; presence and connectivity of channels; and most importantly outlet configuration.

16.1.3.6 Water Quality Protection

This assessment rates the wetland's ability and opportunity to improve water quality. The level of functioning is determined based on runoff characteristics, wetland configuration, vegetation, sedimentation processes, and nutrient cycling. Runoff characteristics that are evaluated include: land use in the upstream watershed, the stormwater delivery system to the wetland, sediment delivery characteristics, and the extent, condition, and width of upland buffer. The ability of the wetland to remove sediment from stormwater is determined by wetland configuration, emergent vegetation, and overland flow characteristics. Indicators that a wetland has been affected by nutrient loading include the presence of monotypic vegetation and/or algal blooms.

16.1.3.7 Shoreline Protection

Shoreline protection is typically evaluated only for those wetlands adjacent to lakes, streams, or deepwater habitats. The function is rated based on the wetlands opportunity and ability to protect the

shoreline; i.e., wetlands located in areas frequently experiencing large waves and high currents have the best opportunity to protect the shore. In addition, shore areas with sandy soils and little vegetation or shallow-rooted vegetation will benefit the most from shoreline wetlands. The wetland width, vegetative cover, and resistance of the vegetation to erosive forces determine the wetland's ability to protect the shoreline. This function is rated based on the potential for bank erosion due to wave action and characteristics of the bank along with the wetland vegetation characteristics.

16.1.3.8 Aesthetics/Recreation/Education and Science

The aesthetics/recreation/education and science function and value of a wetland could be evaluated based on the wetland's visibility, accessibility, evidence of recreational uses, evidence of human influences (e.g. noise and air pollution) and any known educational or cultural purposes. Accessibility of the wetland is key to its aesthetic or educational appreciation. While dependent on accessibility, a wetland's functional level could be evaluated by the view it provides observers. Distinct contrast between the wetland and surrounding upland may increase its perceived importance. Also, diversity of wetland types or vegetation communities may increase its functional level as compared to monotypic open water or vegetation. This wetland value was rated using best professional judgment based primarily on observable recreational uses and potential educational benefits.

16.1.4 Wetland Sensitivity to Stormwater Input

Stormwater runoff carries soil particles, nutrients, and contaminants which can change the ecological balance of the receiving water body. Changes in the volume or rate of stormwater entering or discharging from the water body can also change the ecological balance. Change in the ecological balance of a wetland often results in changes in the water quality, changes in animal and fish habitat, replacement of native vegetation with invasive and tolerant plant species, and/or other impacts to the wetland's functions and values.

The state guidance document (State of Minnesota, Storm Water Advisory Group, June 1997) developed a classification for determining the susceptibility of wetlands to degradation by stormwater input. This classification relates wetland type to a rating of susceptibility as shown in Table 16.1. Wetlands such as bogs and fens can be easily degraded by changes in the stormwater inflows and are designated as highly susceptible. On the other hand, floodplain forests can tolerate relatively significant changes in the chemical and physical characteristics of stormwater inflow without degradation and are therefore slightly susceptible. Commonly observed shallow marshes and wet meadows dominated by cattail and reed canary grass (respectively) have a moderate susceptibility to stormwater fluctuations.

Field notes recorded during the wetland delineations were used to determine the wetland susceptibility classification for each wetland. The susceptibility of each wetland to degradation by stormwater input was assessed and categorized as high, moderate, or least susceptible. Table 16.2 lists management recommendations for wetlands within each sensitivity classification. The sensitivity rating of each wetland is included in the GIS wetland inventory data tables.

Table 16.1 Susceptibility of Wetlands to Degradation by Stormwater Impacts

Highly Susceptible Wetland Types:[1]	Moderately Susceptible Wetland Types:[2]	Slightly Susceptible Wetland Types:[3]	Least Susceptible Wetland Types:[4]
Sedge Meadows	Shrub-carrs[a]	Floodplain Forests[a]	Gravel Pits
Open Bogs	Alder Thickets[b]	Fresh (Wet) Meadows[b]	Cultivated Hydric Soils
Coniferous Bogs	Fresh (Wet) Meadows[c, e]	Shallow Marshes[c]	Dredged Material/Fill Material Disposal Sites
Calcarcous Fens	Shallow Marshes[d, e]	Deep Marshes[c]	
Low Prairies	Deep Marshes[d, e]		
Lowland Hardwood Swamps			
Seasonally Flooded Basins			

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[1] Special consideration must be given to avoid altering these wetland types. Inundation must be avoided. Water chemistry changes due to alteration by stormwater impacts can also cause adverse impacts. Note: All scientific and natural areas and pristine wetland should be considered in this category regardless of wetland type.

[2] **a., b., c.** Can tolerate inundation from 6 inches to 12 inches for short periods of time. May be completely dry in drought or late summer conditions.

d. Can tolerate +12 inches inundation, but adversely impacted by sediment and/or nutrient loading and prolonged high water levels.

e. Some exceptions.

[3] **a.** Can tolerate annual inundation of 1 to 6 feet or more, possibly more than once/year.

b. Fresh meadows which are dominated by reed canary grass.

c. Shallow marshes dominated by reed canary grass, cattail, giant reed or purple loosestrife.

[4] These wetlands are usually so degraded that input of urban stormwater may not have adverse impacts.

Notes: Appendix A (of the "source" of this table) contains a more complete description of wetland characteristics under each category.

Pristine wetlands are those that show little disturbance from human activity.

Source: "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.

Table 16.2 Management Recommendations for Each Wetland Sensitivity Classification

High	Moderate	Least
Special consideration must be given to avoid altering these wetland types. Inundation must be avoided. Water chemistry due to alteration by stormwater impacts can also cause adverse impacts.	These wetlands can tolerate only moderate alterations in hydrology. They have very good wildlife habitat value and a relatively diverse plant community. They will tolerate an additional 6 inches of inundation, but will be adversely impacted by sediment and/or nutrient loading and prolonged high water levels.	These wetlands are usually so degraded that input of urban stormwater may not have adverse impacts.
Maintain the existing **Storm Water Bounce** or degree of water level fluctuation.	Maintain the existing **Storm Water Bounce** or degree of water level fluctuation. Limit the maximum addition of water to 6 inches.	No limit for **Storm Water Bounce** or degree of water level fluctuation.
Maintain the existing **Discharge Rate**.	Maintain the existing **Discharge Rate**.	Maintain or decrease the existing **Discharge Rate**.
For 1 & 2-year storm events, maintain existing **inundation periods**.	For 1 & 2-year storm events, maintain existing **inundation periods**. Limit maximum inundation to one additional day.	For 1 & 2-year storm events, maintain existing **inundation periods**. Limit maximum inundation to an additional 7 days.
For 10-year storm events and greater, maintain existing **inundation periods**.	For 10-year storm events and greater, maintain existing **inundation periods**. Limit maximum inundation to an additional 7 days.	For 10-year storm events and greater, maintain existing **inundation periods**. Limit maximum inundation to an additional 21 days.
Do not change the outlet control elevation.	Do not change the outlet control elevation.	May raise **outlet control elevation** up to 4 feet above existing outlet elevation.
For landlocked wetlands, keep the **Run-out** control elevations above the delineated wetland edge.	For landlocked wetlands, keep the **Run-out** control elevations above the delineated wetland edge.	For landlocked wetlands, keep the **Run-out** control elevations above the delineated wetland edge.
Recommendation: If not already implemented, a preservation program should be initiated. Active protection from invasive plant species should begin. Purple Loosestrife, reed canary grass, and hybrid cattail should be eradicated from these wetlands.	Recommendation: These wetlands have good potential to restore native plant communities. It is well worth the effort to control invasive species (especially purple loosestrife) in these wetlands.	Recommendation: These wetlands could be altered to improve stormwater storage and to improve water quality and not severely impact the wetland quality.

16.2 MCWD Functional Assessment of Wetlands – 2003

In 2001-2003, the MCWD undertook a Functional Assessment of Wetlands (FAW) within the entire Minnehaha Creek Watershed District, which covers the northeast portion of the City of Edina. This assessment included the evaluation of the majority of wetlands within the MCWD including the verification the presence of a wetland, the mapping of the approximate wetland boundary, and assessment of wetland functions. The following sections discuss the FAW in more detail.

16.2.1 Delineation and Inventory

The 2003 wetland assessment evaluated the wetlands identified in the Hennepin Conservation District Comprehensive Wetland Inventory (HCWI) that were greater than one-quarter acre in size. Most of the wetlands greater than approximately one-quarter acre in size were inventoried and field evaluated, to determine if the area was actually a wetland. The inventory identified wetland vegetation, type, location and boundaries, size, groundwater interaction, function, restoration potential, as well as the presence of buffers, invasive or nuisance vegetation, and rare/unique features. Wetland functions were evaluated using a variant of the Minnesota Routine Assessment Method (MnRAM) (DNR, 1998). Restoration potential was estimated based on wetland size, property ownership, and ease of restoration.

Additionally, USFWS Cowardin and Circular 39 classifications were assigned to each wetland during field inspections.

Wetlands identified on the HCWI that are smaller than one-quarter acre in size were originally identified using historic aerial photos, infrared photos, soil types, NWI and PWI data, and Hennepin County Mosquito Control maps but were not field verified or assessed as part of the 2003 MCWD FAW. These wetlands have been included in the City's updated wetland inventory for the portion of the city within the Minnehaha Creek Watershed District, but may not have complete information available.

16.2.2 Critical Wetland Resources

Wetlands in the MCWD were evaluated for designation as critical resources based on several features defined in the Minnesota Statutes. These critical wetland resources are classified by the MCWD into the Preserve management classification. 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)

- State Aquatic Management Areas (Minn. Stat. 86A.05)
- Calcareous Fens (Minn. Rules 8420.1010 through 8420.1060)
- High priority areas for wetland preservation, enhancement, restoration, and establishment (Minn. Rules 8420.0350, subpart 2)
- Designated historic or archaeological sites

16.2.3 Wetland Susceptibility to Stormwater

The state guidance document Stormwater and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snow-Melt Runoff on Wetlands (State of Minnesota, Storm Water Advisory Group, June 1997) developed a methodology for determining the susceptibility of wetlands to degradation by stormwater input. This methodology relates wetland type to a level of susceptibility as shown in Table 16.1. The MCWD used this methodology to identify those wetlands susceptible to degradation by stormwater.

16.2.4 Wetland Management Classification

Based on the results of the field evaluation and its resource significance and susceptibility to stormwater input, each wetland within the MCWD was assigned to one of four categories: Preserve, Manage 1, Manage 2, or Manage 3. Preserve wetland are the highest quality wetlands or have been identified as important wetland resources. The MCWD management classification of each wetland is included in the GIS wetland inventory data tables.

16.3 Circular 39 Wetland Classification

The *Wetlands of the United States* was published in 1959 by the U.S. Fish and Wildlife Service and is commonly referred to as "Circular 39" (Shaw and Fredine, 1959). The Circular 39 Wetland Classification System was the first method that the U.S. Fish and Wildlife Service used to classify wetland basins in the U.S. It is composed of 20 wetland types of which 7 are found in the City of Edina. A general description of each wetland type is provided below.

As part of the City of Edina's 1999 wetland inventory and the 2003 MCWD FAW, Circular 39 classifications were assigned to each wetland during field inspections. Figure 16.2 shows the wetlands classification within the City. The Circular 39 classification for each wetland within the City is included in the GIS wetlands inventory database.

16.3.1.1 Type 1: Seasonally Flooded Basin, Floodplain Forest

Soil is covered with water or is waterlogged during variable seasonal periods but usually is well-drained during much of the growing season. This type is found both in upland depressions and in overflow bottomlands. In uplands, basins or flats may be filled with water during periods of heavy rain or melting snow.

Vegetation varies greatly according to season and duration of flooding: from bottomland hardwoods to herbaceous plants. Where the water has receded early in the growing season, smartweeds, wild millet, fall panicum, redroot cyperus, and weeds (i.e., marsh elder, ragweed, and cockleburs) are likely to occur. Shallow basins that are submerged only very temporarily usually develop little or no wetland vegetation.

16.3.1.2 Type 2: Wet Meadow, Fresh Wet Meadow, Wet to Wet-Mesic Prairie, Sedge Meadow, and Calcareous Fen

Soil is usually without standing water during most of the growing season but is waterlogged within at least a few inches of the surface. Meadows may fill shallow basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side. Vegetation includes grasses, sedges, rushes and various broad-leaved plants. In the North, representative plants are *Carex*, rushes, redtop, reedgrasses, manna grasses, prairie cordgrass, and mints. Other wetland plant community types include low prairies, sedge meadows, and calcareous fens.

16.3.1.3 Type 3: Shallow Marsh

Soil is usually waterlogged early during the growing season and may often be covered with as much as 6 inches or more of water. These marshes may nearly fill shallow lake basins or sloughs, or may border deep marshes on the landward side. These are common as seep areas on irrigated lands. Vegetation includes grasses, bulrushes, spikerushes, and various other marsh plants such as cattails, arrowhead, pickerelweed, and smartweeds. Common representatives in the North are reed, whitetop, rice cutgrass, *Carex*, and giant burreed.

16.3.1.4 Type 4: Deep Marsh

Soil is usually covered with 6 inches to 3 feet or more of water during the growing season. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattails, reeds, bulrushes, spikerushes and wild rice. In open areas, pondweeds, naiads, coontail, watermilfoils, waterweeds, duckweed, water lilies, or spatterdocks may occur.

16.3.1.5 Type 5: Shallow Open Water

Shallow ponds and reservoirs are included in this type. Water is usually less than 10-feet deep and is fringed by a border of emergent vegetation similar to open areas of Type 4. Vegetation (mainly at water depths less than 6 feet) includes pondweeds, naiads, wild celery, coontail, watermilfoils, muskgrass, waterlilies, and spatterdocks.

16.3.1.6 Type 6: Shrub Swamp; Shrub Carr, Alder Thicket

The soil is usually waterlogged during the growing season and is often covered with as much as 6 inches of water. Shrub swamps occur mostly along sluggish streams and occasionally on flood plains. Vegetation includes alders, willows, buttonbush, dogwoods and swamp-privet.

16.3.1.7 Type 7: Wooded Swamps; Hardwood Swamp, Coniferous Swamp

The soil is waterlogged at least to within a few inches of the surface during the growing season and is often covered with as much as 1 foot of water. Wooded swamps occur mostly along sluggish streams, on old riverine oxbows, on floodplains, on flat uplands, and in very shallow lake basins. Forest vegetation includes tamarack, arborvitae (cedar), black spruce, balsam fir, red maple, and black ash. Northern evergreen swamps usually have a thick ground covering of mosses. Deciduous swamps frequently support beds of duckweeds, smartweeds, and other herbs.

16.4 Cowardin Wetland Classification

The *Classification of Wetlands and Deepwater Habitats of the United States* was published by the U.S. Fish and Wildlife Service in 1979 (Cowardin et al., 1979). This wetland classification methodology was used to classify wetlands in the development of the National Wetlands Inventory maps beginning in the late 1970s and early 1980s. The structure of the classification is hierarchical progressing from Systems and Subsystems, at the most general levels, to Classes, Subclasses, and Dominance Types at the most specific levels. A general description of the hierarchical structure is provided below.

As part of the City of Edina's 1999 wetland inventory and the 2003 MCWD FAW, Cowardin wetland classifications were assigned to each wetland during field inspections. The Cowardin classification for each wetland within the City is included in the GIS wetlands inventory database.

16.4.1.1 System

The term System refers to a complex of wetlands and deepwater habitats that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors. The primary systems found in Edina are Palustrine, Lacustrine, and Riverine while Marine and Estuarine Systems are not found in the City.

L: Lacustrine (lakes and deep ponds) - Lacustrine Systems include wetlands and deepwater habitats with all of the following three characteristics:

- Situated in a topographic depression or a dammed river channel;
- Lacking trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 30 percent areal coverage;
- Total area exceeds 8 hectares (20 acres).
- Basins or catchments less than 8 hectares in size are included if they have at least one of the following characteristics:
- A wave-formed or bedrock feature forms all or part of the shoreline boundary; or
- The catchment has, at low water, a depth greater than 2 meters (6.6 feet) in the deepest part of the basin.

P: Palustrine (shallow ponds, marshes, swamps and sloughs) - Palustrine Systems include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens.

R: Riverine (rivers, creeks and streams) - Riverine Systems are contained in natural or artificial channels periodically or continuously containing flowing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System.

16.4.1.2 Subsystem

The term Subsystem refers to a further subdivision of Systems into more specific categories. The Palustrine System has no subsystems associated with it while Lacustrine Systems have two Subsystems and Riverine Systems have four, of which only one applies in the City of Edina. Each Subsystem is unique for the System to which it applies.

L1: Limnetic - Extends outward from Littoral boundary and includes deepwater habitats within the Lacustrine System.

L2: Littoral - Extends from shoreward boundary to 2 meters (6 feet) below annual low water or to the maximum extent of non-persistent emergents, if these grow at greater than 2 meters.

R2: Lower Perennial

16.4.1.3 Class, Subclass

The wetland Class is the highest taxonomic unit below the Subsystem level. The Class code describes the general appearance of the habitat in terms of either the dominant life form of the vegetation or the physiography and composition of the substrate. Life forms (e.g. trees, shrubs, emergents) are used to define classes because they are easily recognizable, do not change distribution rapidly, and have traditionally been used to classify wetlands. Finer differences in life forms are recognized at the Subclass level.

Mixed classes are used as sparingly as possible, under two main conditions: (1) The wetland contains two or more distinct cover types each encompassing at least 30 percent areal coverage of the highest life form, but is too small in size to allow separate delineation of each cover type; and (2) The wetland contains 2 or more classes or subclasses each comprising at least 30 percent areal coverage so evenly interspersed that separate delineation is not possible at the scale used for classification. Mixed subclasses are also allowed and follow the same rules for mixed classes (Cowardin et al., 1979).

AB: Aquatic Bed—Includes wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years.

Subclasses include: AB1 = Algal, AB2 = Aquatic Moss, AB3 = Rooted Vascular, AB4 = Floating Vascular, AB5 = Unknown Submergent, and AB6 = Unknown Surface.

EM: Emergent—Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years.

Subclasses include: EM1 = Persistent (plants that normally remain standing at least until the beginning of the next growing season), and EM2 = Nonpersistent (plants which fall to the surface of the substrate or below the surface of the water at the end of the growing season).

FO: Forested—Woody vegetation greater than 6 meters (20 feet) tall.

Subclass determination is based on: which type represents more than 50 percent of the areal canopy coverage during the leaf-on period. Subclasses include: FO1 = Broad-leaved Deciduous, FO2 = Needle-leaved Deciduous, FO3 = Broad-leaved Evergreen, FO4 = Needle-leaved Evergreen, FO5 = Dead, FO6 = Deciduous, and FO7 = Evergreen.

SS: Scrub/Shrub—Woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees (saplings) or trees that are small or stunted because of environmental conditions.

Subclass determination is based on: which type represents more than 50 percent of the areal canopy coverage during the leaf-on period and include: SS1 = Broad-leaved Deciduous, SS2 = Needle-leaved Deciduous, SS3 = Broad-leaved Evergreen, SS4 = Needle-leaved Evergreen, SS5 = Dead, SS6 = Deciduous (used if deciduous woody vegetation cannot be identified on aerial photography as either Broad-leaved or Needle-leaved), and SS7 = Evergreen (used if evergreen woody vegetation cannot be identified on aerial photography as either Broad-leaved or Needle-leaved).

UB: Unconsolidated Bottom—Includes all wetlands and deepwater habitats with at least 25 percent cover of particles smaller than stones (less than 6-7 cm.), and a vegetative cover less than 30 percent.

16.4.1.4 Water Regime

Precise description of hydrologic characteristics requires detailed knowledge of the duration and timing of surface inundation, both yearly and long-term, as well as an understanding of groundwater fluctuations. Because such information is seldom available, the water regimes that, in part, determine characteristic wetland and deepwater plant and animal communities are described here in only general terms (Cowardin, et al., 1979). Water regimes are grouped under two major categories, Tidal and Nontidal. The Tidal Water Regime does not occur in the City so is not described here.

A: Temporarily Flooded—Surface water present for brief periods during the growing season, but the water table usually lies well below the soil surface. Plants that grow both in uplands and wetlands are characteristic of this water regime. The temporarily flooded regime also includes wetlands where water is present for variable periods without detectable seasonal periodicity.

Weeks, months, or even years may intervene between periods of inundation. The dominant plant communities under this regime may change as soil moisture conditions change.

B: Saturated—The substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present.

C: Seasonally Flooded—Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. When surface water is absent, the water table is often near the land surface. The water table after flooding ceases is highly variable, extending from saturated to a water table well below the ground surface.

F: Semipermanently Flooded—Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

G: Intermittently Exposed—Surface water is present throughout the year except in years of extreme drought.

H: Permanently Flooded—Water covers the land surface throughout the year in all years. Vegetation is composed of obligate hydrophytes.

16.4.1.5 Special Modifiers

Many wetlands and deepwater habitats are man-made and natural ones have been modified to some degree by the activities of man or beavers. Since the nature of these modifications often greatly influences the character of such habitats, special modifying terms have been included here to emphasize their importance (Cowardin, et al., 1979).

b: Beaver—Created or modified by a beaver dam.

d: Partly Drained—The water level has been artificially lowered, but he area is still classified as wetland because soil moisture is sufficient to support hydrophytes. Drained areas are not considered wetland if they can no longer support hydrophytes.

f: Farmed—The soil surface has been mechanically or physically altered for production of crops, but hydrophytes will become reestablished if farming is discontinued.

h: Diked/Impounded—Created or modified by a barrier or dam which purposefully or unintentionally obstructs the outflow of water. Both man-made and beaver dams are included.

r: Artificial—Refers to substrates classified as Rock Bottom, Unconsolidated Bottom, Rocky Shore, and Unconsolidated Shore that were emplaced by humans, using either natural materials such as dredge spoil or synthetic materials such as discarded automobiles, tires, or concrete.

s: Spoil—Refers to the placement of spoil materials which have resulted in the establishment of wetland.

x: Excavated—Lies within a basin or channel excavated by humans.

16.5 Public Waters

The Minnesota Department of Natural Resources (MnDNR) has designated certain waters of the state as public waters (Minn. Rules 6115.1060). MnDNR "Protected Waters and Wetlands" maps show public waters within the city. A MnDNR permit is required for work that would alter the course, current, or cross-section of a designated public water. Protected waters and wetlands maps show public waters as one of the following: protected waters; protected wetlands; protected watercourses; or, protected public ditches.

Table 16.3 lists the MnDNR Protected Waters and Wetlands within the city. The table includes the MnDNR identifier for each pond, as well as the corresponding subwatershed for this stormwater study. Protected waters are identified with a number and the letter "P". Protected wetlands are identified with a number and the letter "W". Protected wetlands include, and are limited to, Type 3, 4, and 5 wetlands that have been designated as protected waters and are 2½ acres or more in size (10 acres in unincorporated areas).

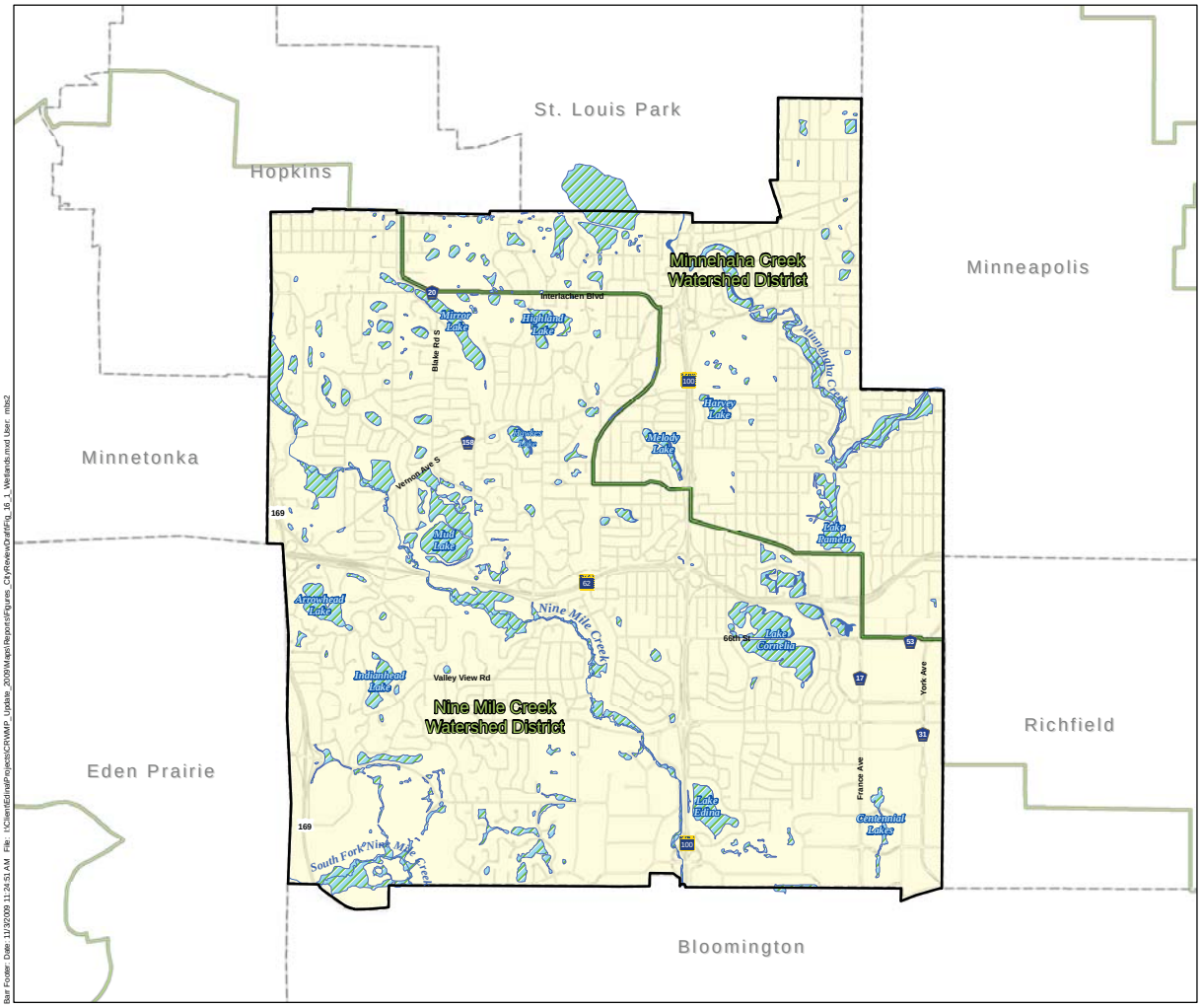
Protected water courses and ditches in Edina include:

- Minnehaha Creek
- North Fork of Nine Mile Creek
- South Fork of Nine Mile Creek
- Braemar Branch of Nine Mile Creek

Table 16.3 MnDNR Protected Waters and Wetlands within Edina

MnDNR Protected Waters and Wetlands	Corresponding Subwatershed ID(s)
804W	NMN_5
805W	NMN_24
1106W	NMN_4
803W	MD_21
802W	MD_25
801W	NMN_50
800W	NMN_75
799W	NMN_76, NMN_55
55P	ML_1, ML_32
781W	ML_28

MnDNR Protected Waters and Wetlands	Corresponding Subwatershed ID(s)
782W	ML_16
668P	HI_1
56P	HL_1
780W	EI_32
667W	EI_1
666W	EI_19
41P	Segment of Minnehaha Creek
670W	MHS_22
669W	ML_8
675P	LP_14, LP_26
676W	NC_5
677W	NC_2
678W	NC_30
679W	NC_3
680W	NC_4
28P	NC_62, SC_1
671P	NMC_112
50P	MD_50, MD_1
672W	CO_1
673P	NMC_1
674W	NMC_77
29P	LE_1
1041W	NMS_3
1038W	SWP_3
1040W	SWP_4, SWP_2, SWP_1
1039W	SWP_5, SWP_35, SWP_14
45P	AH_1
806W	AH_6
807W	EP_2
808W	EP_2
44P	IH_1
1013W	NMSF_1, NMSF_12



City of Edina Boundary
Roads/Highways
Creek/Stream
Lake/Wetland*
Watershed District Boundary

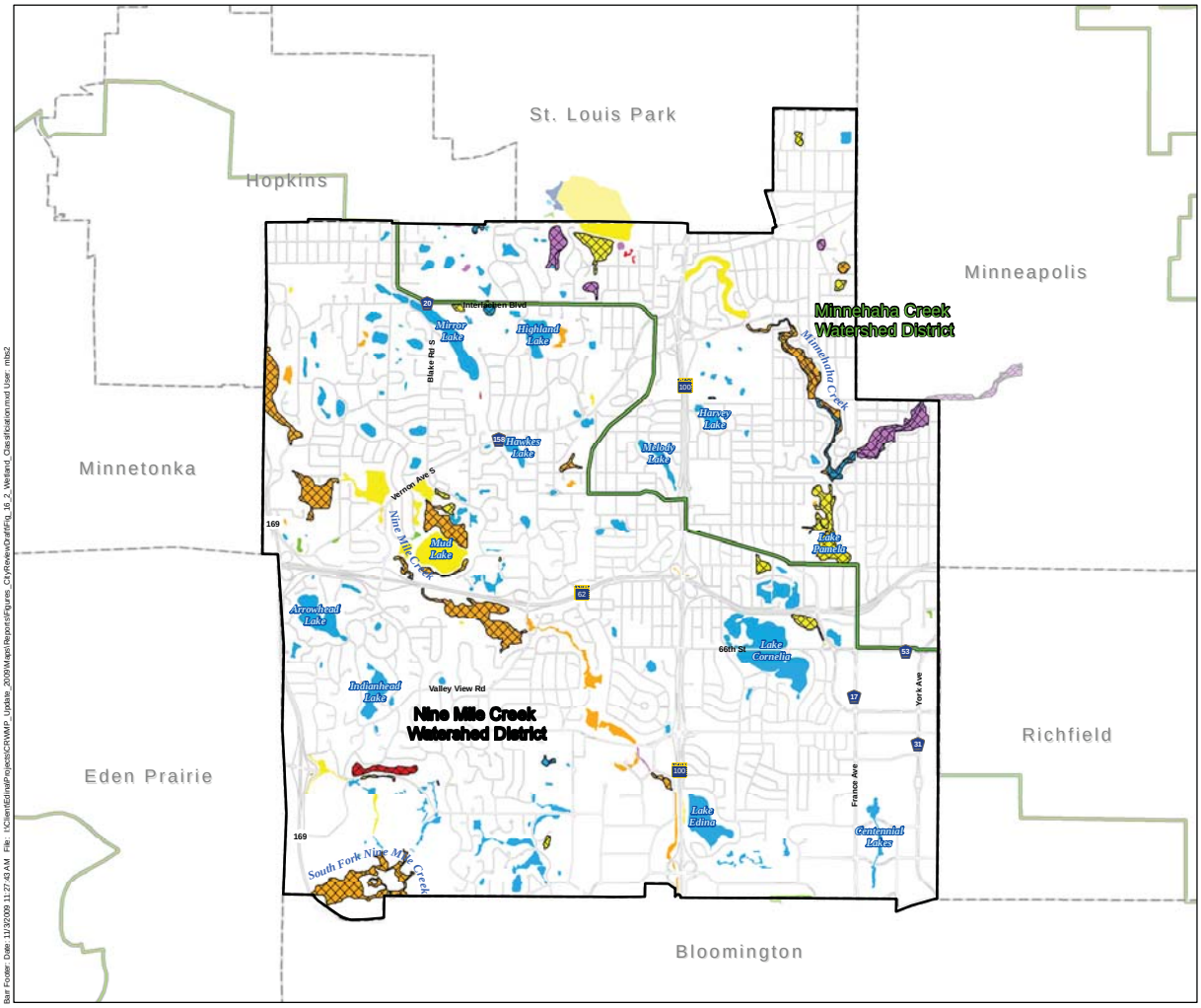
Feet
3,000 0 3,000

Meters
1,000 0 1,000

Figure 16.1

WETLANDS
Comprehensive Water Resource Management Plan
City of Edina, Minnesota

Barr Footer: Date: 11/3/2009 11:24:51 AM File: \\Client\Edina\Projects\CRWMP_Update_2009\Maps\Reports\Figures_CityReview\DraftFig_16_1_Wetlands.mxd User: mbs2



City of Edina Boundary
Roads/Highways
Watershed District Boundary

Wetland Type*

- Unclassified
- Type 1
- Type 1 Predominant + Others
- Type 2
- Type 2 Predominant + Others
- Type 3
- Type 3 Predominant + Others
- Type 4
- Type 5
- Type 5 Predominant + Others
- Type 6
- Type 7
- Type 7 Predominant + Others

* Based on the Fish and Wildlife Service Circular 39 Classification System.

Wetlands within the Minnehaha Creek Watershed District were identified and assessed in 2005 as part of the Minnehaha Creek Functional Assessment of Wetlands. Wetlands located in the remaining portion of the city were identified and assessed in 1999 as part of the City of Edina's wetland inventory.

N

Feet
3,000 0 3,000

Meters
1,000 0 1,000

Figure 16.2

WETLAND CLASSIFICATIONS
Comprehensive Water Resource Management Plan
City of Edina, Minnesota

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