

# **CARNELIAN-MARINE-ST. CROIX WATERSHED MANAGEMENT PLAN**

## **APPENDIX D**

### **Wetland Management Plan**

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## **Wetland Management Plan**

July 12, 2010

Prepared by Emmons & Olivier Resources, Inc. (EOR)

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Carnelian-Marine-St Croix Watershed District  
Board of Managers  
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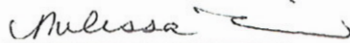
Board of Managers:

The staff at Emmons & Olivier Resources is pleased to submit to you this Wetland Management Plan. This Plan is the result of extensive technical analysis and public participation. The information included herein has been developed and reviewed through the result of many shareholder meetings. Organizations and parties providing technical guidance and comment to this WMP include:

- Carnelian-Marine-St Croix Watershed District
- Washington Conservation District
- Minnesota Board of Water and Soil Resources
- Minnesota Department of Natural Resources
- U.S. Army Corps of Engineers
- Metropolitan Council
- Minnesota Pollution Control Agency
- City of Stillwater
- Property owners

The Wetland Management Plan is meant to supplement the Wetland Conservation Act and add additional protection and flexibility in managing the district's wetlands.

Respectfully submitted,



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**Carnelian-Marine-St. Croix Watershed District Wetland Management Plan**

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### 1. EXECUTIVE SUMMARY

The purpose of this plan is to evaluate the wetland resources of **Carnelian-Marine-St. Croix Watershed District (CMSCWD)**, describe the approach to protecting the functions and diversity of the district's wetlands, and lay the groundwork to improve these resources.

The main emphasis of the Carnelian-Marine-St. Croix Watershed District is the "protection and improvement of water quality" and according to their Second Generation Plan, CMSCWD operates "with intent to protect and improve the water resources, natural habitat and personal property within its boundaries; to educate property owners and the community on the value of water resources; and to promote progressive public relationships and interagency consistency." These goals are consistent with the intent of state and federal rules for wetland protection. The strategy for addressing these goals is to evaluate wetland resources on an individual basin scale, and on a watershed scale. The watershed scale of analysis allows ecological functions and values to be realized that are lost at a smaller scale. The Wetland Management Plan provides a mechanism to address local wetland management and preservation of aquatic resource functions and values at an individual wetland scale and a watershed scale.

- This **Wetland Management Plan (WMP)** meets CMSCWD's obligations under the **Minnesota Wetland Conservation Act (WCA)** by following the rules set forth under 8420.0650 Local Comprehensive Wetland Protection and Management Plans.
- This Plan meets Federal requirements specified under Section 404 of the Clean Water Act.

The goals of this plan will be accomplished by creating a conceptual framework that identifies high priority resource areas warranting protection, restoration, and enhancement. Rules will be implemented that encourage landowners to protect and enhance the higher quality resources and incorporate low impact development strategies (rain gardens, etc.) as they develop their land.

The WMP provides greater flexibility and control over wetland management and protection to meet the specific needs and goals of the community. Many traditional WCA and Section 404 regulations will be applied to permit applications involving wetlands. For example, Wetland delineations, impact analysis, and replacement plan applications will be required for every application. Applicants will still be required to go through the sequencing process (avoidance, minimization, and replacement) and project justification but with varying levels of requirements for different groups of wetlands. Additionally, the detailed information on wetlands and other resources available to reviewing agencies through the plan will streamline and expedite this process and provide additional flexibility in some cases. The replacement ratio is intended to remain the same for some groups of wetlands, and will be increased for higher valued wetlands. This document is written in recognition of WCA and shall serve as a supplement to this legislation. All current rules and regulations pertaining to WCA not specifically modified in the Wetland Management Plan will remain the same.

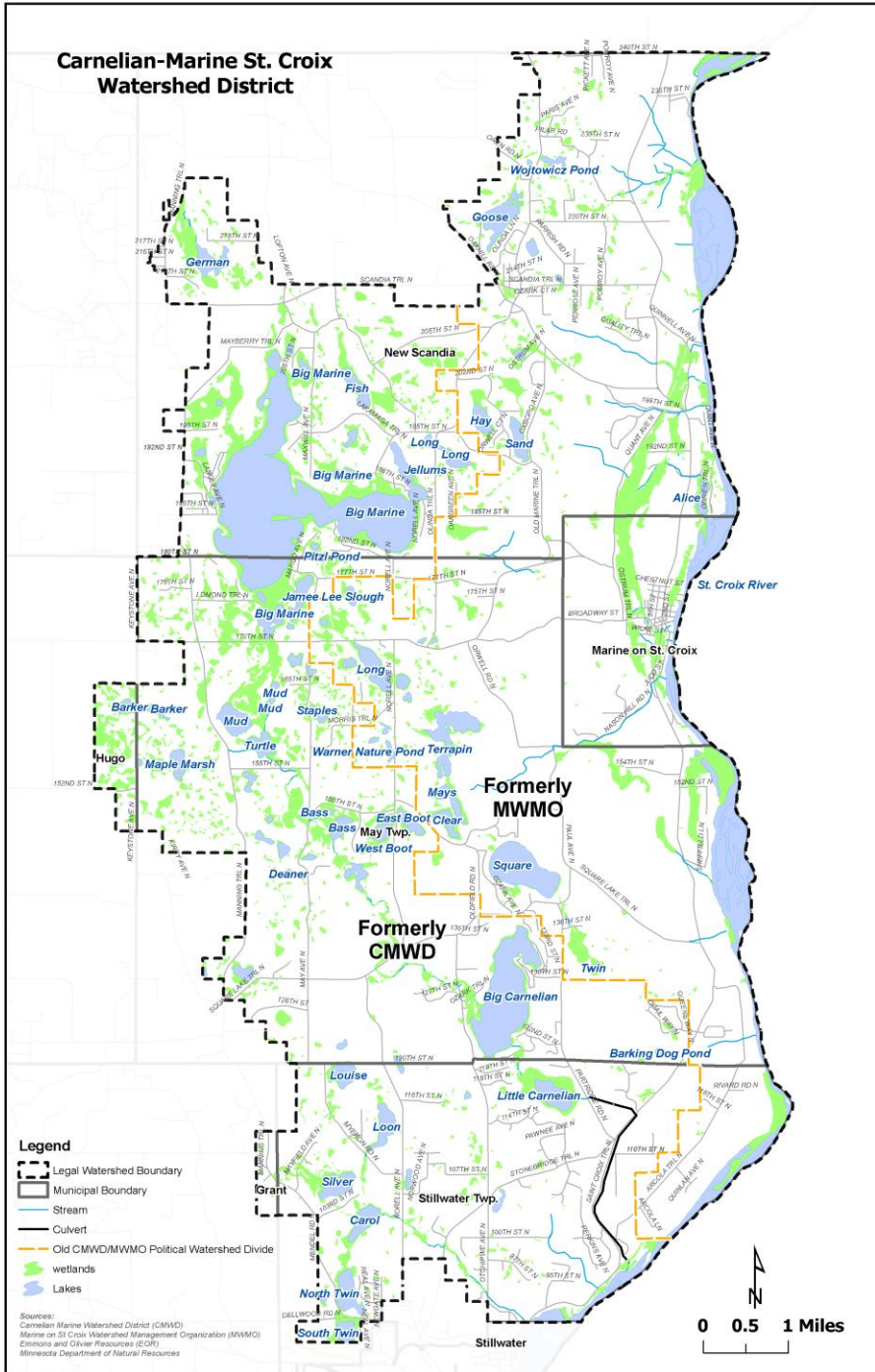
This plan was originally developed for the portion of CMSCWD formerly known as "Carnelian-Marine Watershed District" (CMWD). However, the CMWD has now been combined with the "Marine on St. Croix Water Management Organization" (MWMO) to become the "CMSCWD." For purposes of this plan, a complete inventory and functional assessment was performed for all the wetlands in the area formerly known as CMWD and followed up for all the wetlands in the area formerly known as MWMO. The standards presented in the Wetland Management Plan now apply to all areas within CMSCWD.

## 2. PLAN BACKGROUND

### Location

The Carnelian-Marine-St. Croix Watershed District is on the northeastern edge of the Minneapolis/St. Paul metropolitan area. Figure D-1 shows the area of CMSCWD.

Figure D-1. Carnelian-Marine-St. Croix Watershed District



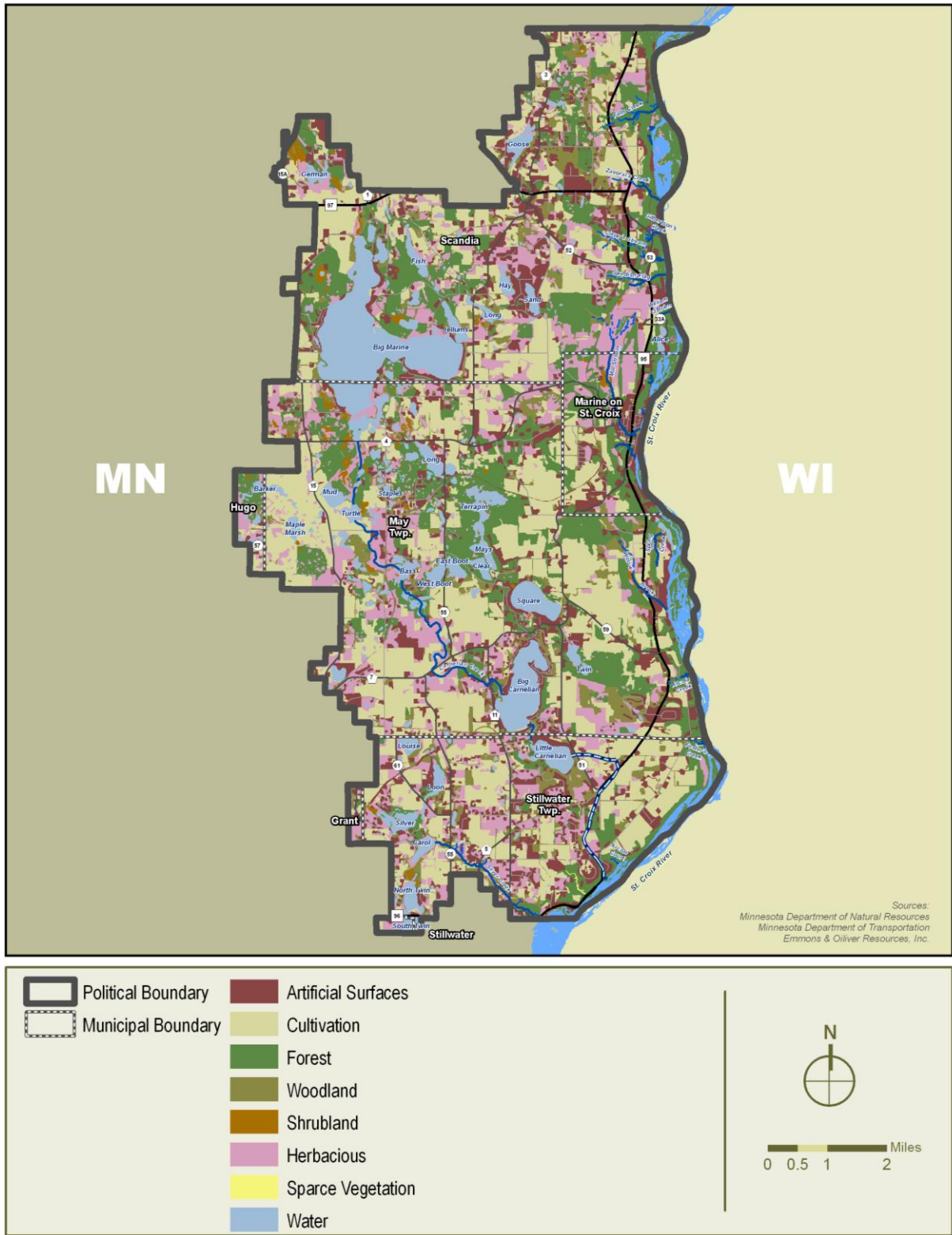
## **Natural Resources**

### *Plant Communities*

Vegetation in the area originally contained a mixture of oak woodland and savanna, dry and mesic prairie and the rich, mesic hardwood forests associated with the “Big Woods.” The distribution of these plant communities was determined by soils, topography, slope aspect and the frequency and distribution of fires and grazing. Today, most of the native prairie has been converted to cropland or pasture and much of the original oak savanna, in the absence of fire and grazing has succeeded to oak woodland and forest. Although much has changed in the last 150 years, the District still retains large areas of high quality wetland complexes, along with areas of forest and woodland, many of these in good condition. See the 2001 Marine Watershed Management Organization Natural Resource Inventory and the 2003 Carnelian-Marine Watershed District Natural Resource Inventory and Assessment for more detailed characterizations of early land cover and land use. Recently, the **Minnesota Land Cover Classification System (MLCCS)** was used to map all existing plant communities within the watershed summarized by the following Land cover Types (Figure D-2). MLCCS inventory is a complete land cover inventory, not just mapping of wetlands. It includes qualitative wetland vegetation assessment data that can be used for the wetland functions assessment. MLCCS allows for GIS-based assessment of many indicators of wetland function, especially those involving landscape characteristics of the watershed. The MLCCS database is very valuable for assessing future land use scenarios and the effect on wetlands.



**Figure D-2. MLCCS Land Cover Types in CMSCWD**

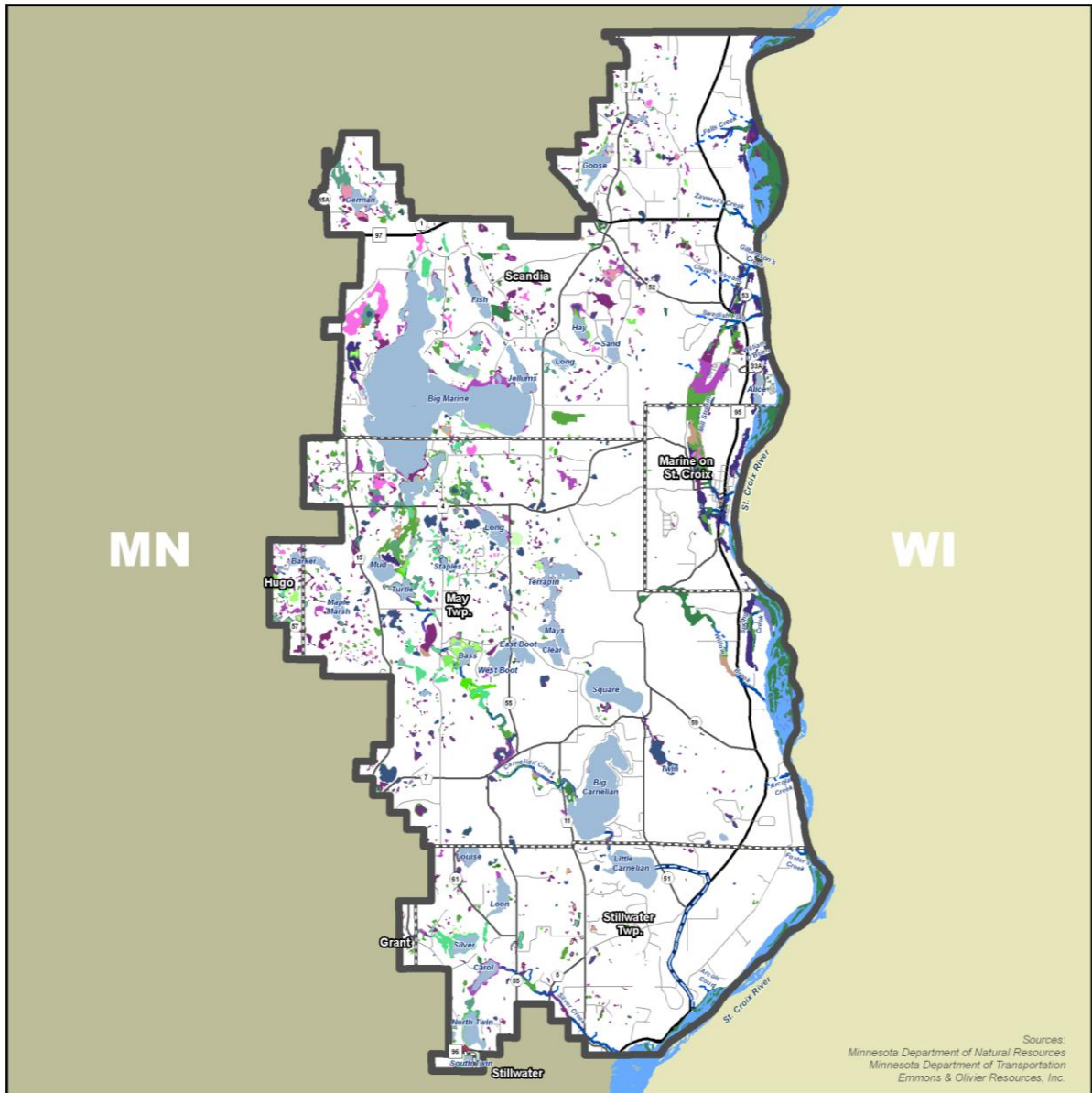


Wetlands

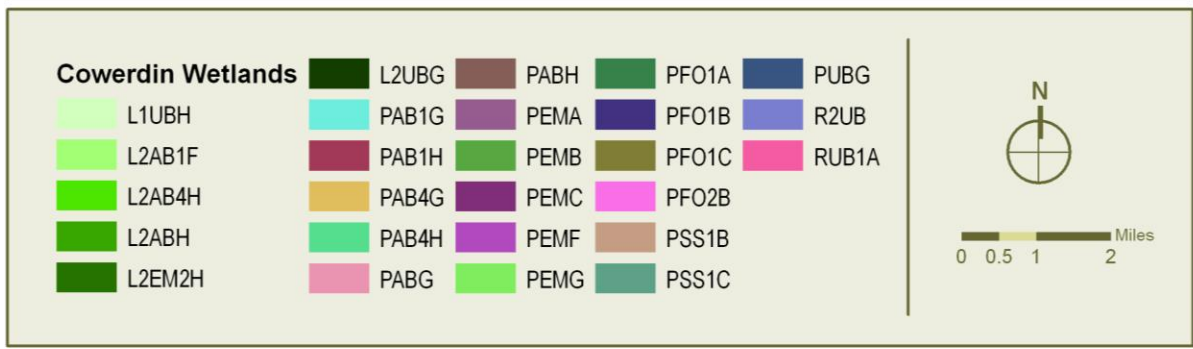
Wetlands are extensive in CMSCWD, encompassing much of the total land area. The **Washington Conservation District (WCD)** assists the local Municipalities as the **Local Government Unit (LGU)** for implementing the Wetland Conservation Act (WCA), which regulates activities having the potential to drain, fill, or alter wetlands.

Wetlands and other land cover were mapped using the Minnesota Land Cover Classification System (MLCCS) and then cover types were cross-referenced to the Cowardin Classification System which indicates many wetland types from forested to shrub to emergent (Figure D-3).

**Figure D-3. Cowardin Classifications within CMSCWD**



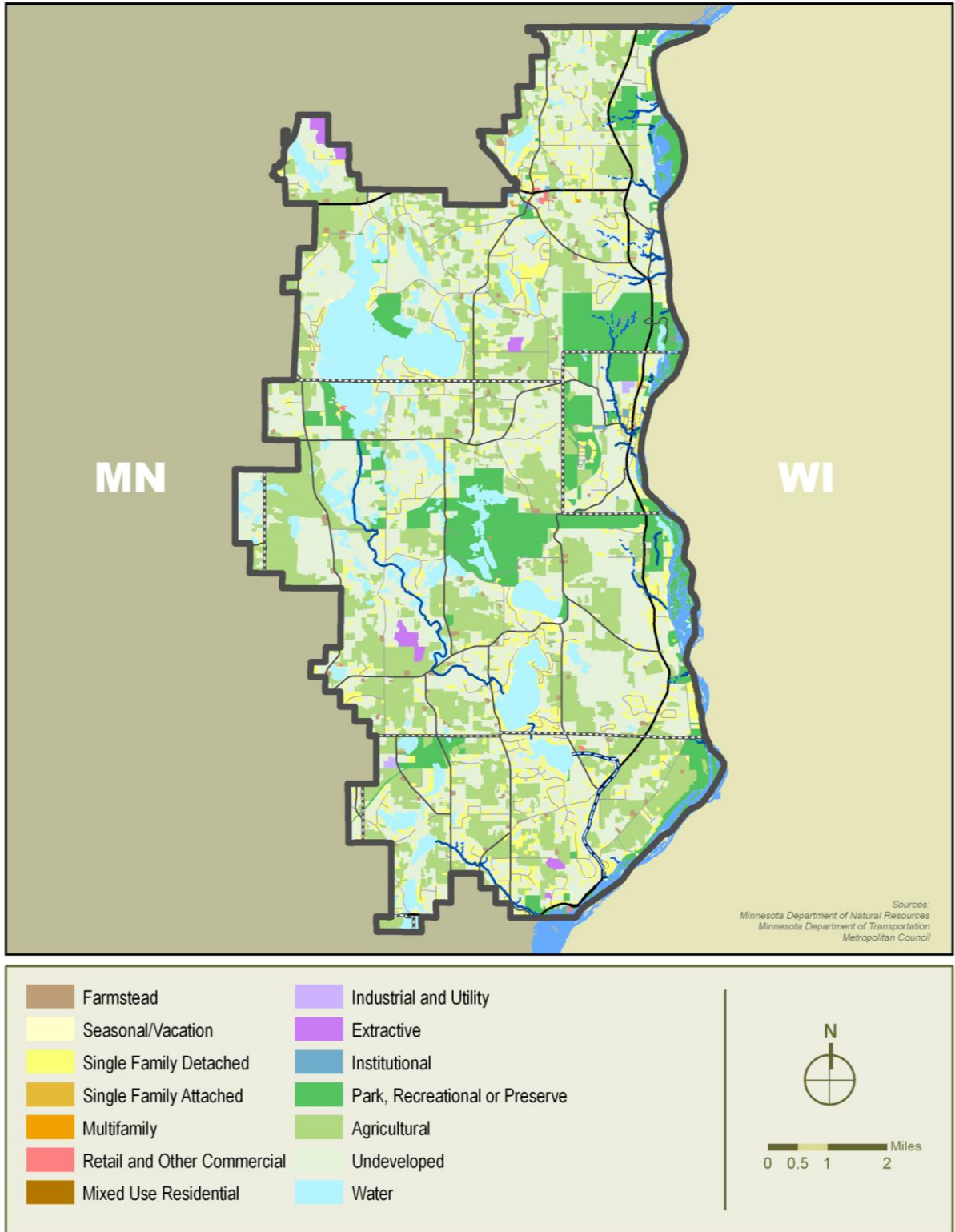
Sources:  
 Minnesota Department of Natural Resources  
 Minnesota Department of Transportation  
 Emmons & Olivier Resources, Inc.



Present Land use

Currently, the CMSCWD is primarily undeveloped and agricultural (Figure D-4)

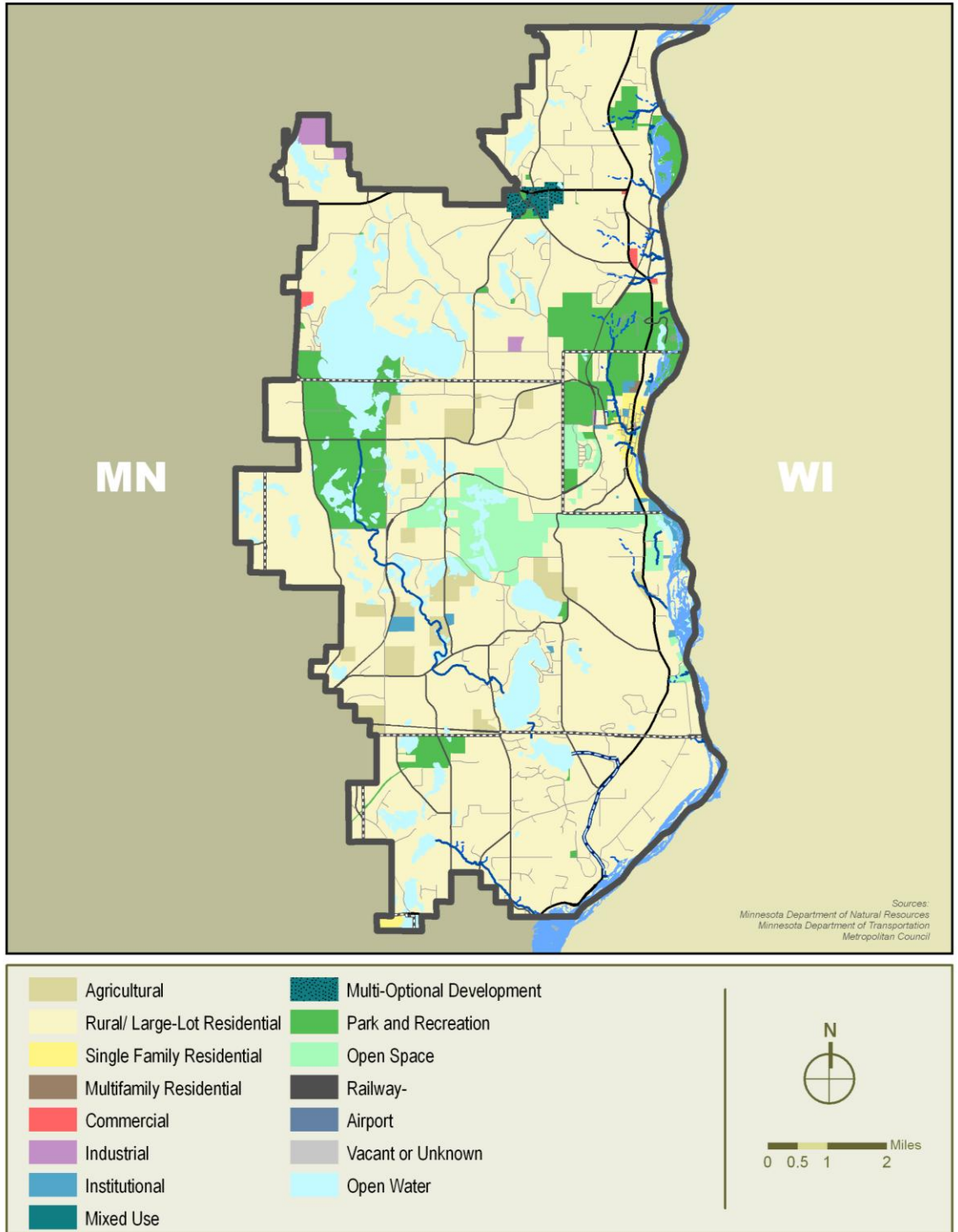
**Figure D-4.** Present Land Use



Future Land Use

Much of the currently undeveloped area is projected to see a fair amount of development pressure associated with projected population growth in terms of an increase in Rural Residential. Figure D-5 illustrates the Metropolitan Council 2030 Land use projections for this area.

**Figure D-5.** Metropolitan Council 2030 Land Use



### 3. PUBLIC AND AGENCY INVOLVEMENT

The process of putting a wetland management plan together is as critical as the actual document. The concerns and values held important by the community are reflected in this plan, as they become the foundation for later policy decisions and future planning efforts.

The CMSCWD WMP has been developed over the past year through a process aimed at balancing technical expertise with public and landowner input. Two integral groups of citizens and technical staff were very active in developing the policies and information contained in the plan.

#### *Carnelian-Marine-St. Croix Watershed District Wetland Management Plan Advisory Board*

The Advisory Board was formed from a group of over 20 concerned citizens to assist in expressing the views of watershed landowners. Advisory Board Members attended six meetings centered on reviewing technical data from wetland surveys, understanding the plan development process, identifying potential issues, and exploring potential projects related to wetland management. Ultimately, the Advisory Board created the prioritization ranking of wetland functions to create the “values” portion of this wetland assessment process.

#### *Technical Advisory Panel*

The Technical Advisory Panel was formed to assist in the development of the Wetland Management Plan. Members included the WCA **Technical Evaluation Panel (TEP)** representatives; the Board Conservationist **Board of Water & Soil Resources (BWSR)**, the Wetland Specialist from Washington Conservation District, and the President of Carnelian-Marine-St. Croix Watershed District. The TEP assisted in making technical findings and recommendations regarding wetland functions, and participated in all Advisory Board Meetings and other agency meetings.

#### *Wetland Management Planning Meetings*

The CMSCWD initiated meetings with agencies, cities, local government units, and other groups to notify them of the upcoming plan amendment and solicit their input during the planning process and draft plan development. On October 11, 2004, an official notice went out to all relevant agencies and LGUs requesting input and involvement during the planning process. That official notice also served as an invitation to all concerned agencies and LGUs to attend an informational meeting on October 25, 2004 at the Oakdale office of Emmons & Olivier Resources. These entities included:

- |  |                       |
|--|-----------------------|
| - MN Department of Agriculture         | - Scandia             |
| - MN Department of Transportation      | - May Township        |
| - MN Department of Health              | - Stillwater Township |
| - MN Department of Natural Resources   | - City of Hugo        |
| - MN Pollution Control Agency          | - City of Grant       |
| - MN Board of Soil and Water Resources | - City of Stillwater  |
| - Metropolitan Council                 | - Washington County   |
| - US Army Corps of Engineers           |                       |
| - Washington Conservation District     |                       |

### *Public Hearings*

A public hearing was held on October 24, 2005 at the Washington Conservation District Office for residents, agencies, and LGU's to learn about the Wetland Management Plan and to have an opportunity for public input.

A final public hearing was held on June 3, 2007 at the monthly Carnelian-Marine-St. Croix Watershed District meeting for residents, agencies, and LGU's to provide any comments on the final draft of the wetland Management Plan before it went before BWSR for its final review.

## **4. WETLAND FUNCTION AND VALUE ASSESSMENT**

Data compiled from the 2001 Marine Watershed Management Organization Natural Resource Inventory, the 2003 Carnelian-Marine Watershed District Natural Resource Inventory and Management Plan, and the 1996 Svoboda Wetland Inventory were used to form the basis of the Wetland Inventory. The presence or absence of a wetland was determined using the criteria for a wetland set forth in the 1987 Manual for Delineating and Identifying Jurisdictional Wetlands (U.S. Corps of Engineers, 1987). It is important to note that wetland edges were not delineated as part of this project. A wetland delineation will need to be performed as part of any potential impact or development activity near the wetland (see VI. "Wetland Delineations"). In addition, the absence of a wetland from this plan does not necessarily mean that a wetland is not present on the site. Extreme efforts were taken to ensure that all wetlands within the district were evaluated as part of the development of this plan; however, the unintentional omission of a particular wetland does not grant permission to impact that wetland before going through the proper regulatory process. All parcels of land should still be investigated for presence of wetlands before any land alteration activities would commence.

The wetland functional assessment conducted was based on the *Minnesota Routine Assessment Method (MnRAM) for Evaluating Wetland Functions - Version 3.0* developed by the Minnesota Interagency Wetlands Group. The methodology assesses the nine functions of wetland communities as listed below in no particular order:

1. Maintenance of Characteristic Vegetative Diversity/Integrity
2. Maintenance of Hydrologic Regime
3. Flood/Stormwater Attenuation
4. Downstream Water Quality
5. Maintenance of Wetland Water Quality
6. Maintenance of Characteristic Wildlife Habitat Structure
7. Maintenance of Characteristic Fishery Habitat
8. Maintenance of Characteristic Amphibian Habitat
9. Ground Water Interaction

The methodology varies slightly from the MnRAM methodology in that it has been modified to facilitate use in an inventory setting. Appendix I details the Wetland Functional Assessment questions used to assess all nine functions, and Appendix II describes protocol used to rank wetland plant community quality.

## **Wetland Function Ranking**

Wetland Functions were ranked in order of local importance by the Advisory Board as follows:

### Prioritized Wetland Functions:

1. Ground Water Interaction
2. Maintenance of Characteristic Vegetative Diversity/Integrity
3. Maintenance of Hydrologic Regime
4. Maintenance of Wetland Water Quality
5. Flood/Stormwater Attenuation
6. Downstream Water Quality
7. Maintenance of Characteristic Wildlife Habitat Structure
8. Maintenance of Characteristic Amphibian Habitat
9. Maintenance of Characteristic Fishery Habitat

This ranking combined with results from the Wetland Functional Assessment serve as the basis for classifying individual wetlands and determining their corresponding management strategies discussed in the next section.

## **5. WETLAND MANAGEMENT GOALS**

As this plan is meant to supplement existing state and federal regulations currently in control of CMSCWD's wetland resources, it is also meant to add additional protection and flexibility in managing the wetlands in the district. As stated previously, the overall goal of this plan is at a minimum to protect the functions and diversity of the district's wetlands and lay the groundwork to improve these resources. This wetland management plan process is then used to develop rules regarding activities in and adjacent to the wetlands in its jurisdiction. The district will work with the LGU's, the state of MN, and the US Army Corps of Engineers to enforce these rules. Utmost emphasis is placed on maintaining and protecting the diverse array of high valued and high functioning wetlands within CMSCWD, with secondary focus on restoration.

### **Wetland Management Goals Overview**

MnRAM 3.0 contains recommendations for wetland management standards for each management classification. For purposes of this study, modifications were made based on templates provided in MnRAM 3.0 documentation. The Wetland Functional Assessment described in the previous section was used to classify CMSCWD's wetlands into one of the four following management categories as described below and shown in Figure D-6:

#### 1. High Quality/Highest Priority

Wetlands classified as High Quality/Highest Priority have at least one of the following characteristics:

- 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 that are groundwater dependent plant communities 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.



- 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.
- Wetlands with a high vegetative diversity/integrity rating and a high rating for wetland water quality; OR wetlands with a high vegetative diversity/integrity rating and a high rating for downstream 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 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.

## 2. Stream Corridor and Shoreland Wetlands (that are not a Category 1)

Wetlands classified as Stream Corridor and Shoreland Wetlands have at least one of the following characteristics:

- These wetlands include all Stream Corridor and Shoreland Wetlands not already classified as Category 1.
- Wetlands rated as high for amphibian habitat.
- Wetlands rated as exceptional or high 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 with a medium vegetative diversity/integrity rating and a high rating for hydrologic regime. 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 that are highly sensitive to stormwater impacts and have a vegetative diversity/integrity rating of medium or high were also placed in this category.
- 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 receive the second highest degree of protection. They provide much of the surface water quality and wildlife benefits to the district.

## 3. Isolated Wetlands (that are not a Category 1)

These wetlands include all other isolated wetlands not already classified as Category 1. These wetlands receive the third highest level of protection.

#### 4. Utilized Wetlands

These wetlands include pre-existing basins used heavily as livestock watering wetlands, stormwater ponds dug out from existing wetland, and other severely degraded wetlands (degraded as defined by WCA). Restoration is encouraged for Capital Improvement Projects, but very low priority for these.

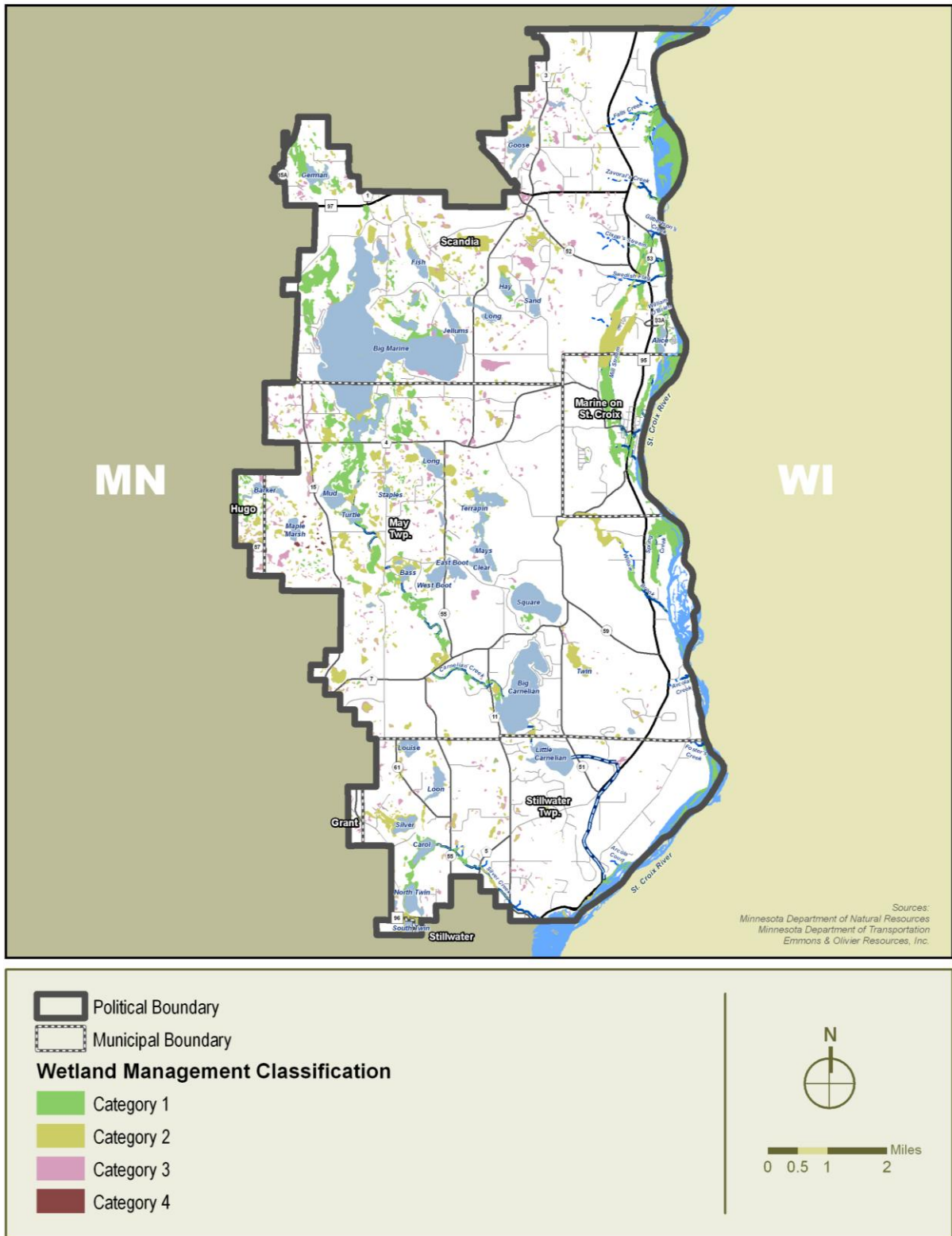
#### Potential Restoration Areas

These wetlands include classification that does not qualify as jurisdictional wetland due to a lack of hydrology; but may revert to wetland if disturbance activities cease or tile lines are disrupted. These basins serve as excellent restoration potential. The CMSCWD has inventoried and prioritized drained basins in the watershed for prime restoration fund candidates.

#### Is there a way for an applicant to request a change in category?

In the event of a dispute concerning wetland management category, the applicant or project proposer will be required to submit a request for a change in Management Category to the CMSCWD and LGU. The request for a change in Management Category must include the wetland number, current classification, a reason(s) for the request, and a completed MnRAM (or most recent version) assessment and completed data sheet. The functional assessment will be reviewed by the TEP, LGU, and/or a CMSCWD approved wetland specialist. The information for review must be submitted with ample growing season remaining for review. This decision is at the discretion of the staff, can be determined on a case by case basis, depending on the ability to determine available wetland indicators and parameters, particularly pertaining to hydrology; and could mean that submittals less than 60 days prior to the end of growing season or before the start of the growing season may be deemed incomplete until the following year's growing season. Staff will make a decision in compliance with Minnesota Statutes, section 15.99 and provide notice to the applicant of the decision as per WCA rules. The decision will indicate the wetland classification and the management and protection strategies assigned to the wetland by support of this document. Questions regarding this decision can be made to the CMSCWD.

**Figure D-6. Wetland Management Categories**



## 6. WETLAND MANAGEMENT STANDARDS

Wetland Management Standards as they apply to the different Management Categories are described below and then summarized in a table at the end of this section. For higher valued wetlands, mitigation requirements are increased significantly over the minimum State requirements in WCA. This is due to several factors. Washington County has lost over 50% of its pre-settlement wetlands to draining and filling activities. Of those remaining, the Carnelian-Marine-St. Croix Watershed District contains many of the most pristine and highly functioning wetlands, which are extremely valuable to the residents of the District, the County, and the State. Because of this, replacement becomes very difficult. The higher mitigation requirements will help to ensure adequate replacement of functions and values of these arguably irreplaceable wetland resources. They are also intended to serve as an increased incentive to avoid impacting the most valuable wetlands. There is ample upland available in the District, making wetland avoidance a very feasible option and not an undue burden on landowners. The Plan also recognizes the importance of taking a landscape approach to wetland management, with the Replacement Fund being used to protect and enhance wetland functions, connectivity, and associated upland habitat.

### Replacement Ratios

Avoidance of wetland impacts is the preferred alternative. However, in some situations of unavoidable impact, replacement after minimized impacts may be permitted. Impacts to existing wetland areas must meet the sequencing requirements as outlined under Minnesota Rules 8420.0520 “Sequencing.” In addition, applicants must adequately explain and justify each individual contiguous wetland alteration area in terms of impact avoidance and minimization alternatives considered.

Replacement must be located within the District and as close as possible to the site of impact. Qualifying township, city, or county road impacts may be mitigated outside the District via the BWSR road replacement bank up to the ratios required by WCA. However, the balance of replacement required must be located within the District.

Full replacement of all wetland functions is required at the following ratios (new wetland area:impacted wetland area):

- (a) 6:1 for impacts to wetlands in Management Category 1
- (b) 4:1 for impacts to wetlands in Management Category 2
- (c) 3:1 for impacts to wetlands in Management Category 3
- (d) 2:1 or minimum required by Minnesota Rules 8420.0522, whichever is greater for impacts to wetlands in Management Category 4.

When wetland is impacted and replaced, the impacted existing upland buffer area must also be replaced via buffer establishment or by payment into the Restoration Fund at a 1:1 ratio if buffer establishment is not reasonably available.

### Eligible Replacement Activities & Priorities.

The following activities, listed in order of priority, are eligible for replacement credit. Applicant must first consider replacement of unavoidable impacts by restoring or, if wetland restoration opportunities are not reasonably available, creating replacement wetland areas having equal or greater function. Restoration and creation activities eligible for replacement credit include those detailed in Minnesota Rules 8420.0526 and listed (as prioritized per District local values) below:

- (a) Protection of wetlands previously restored via conservation easements
- (b) Restoration and protection of exceptional natural resource value
- (c) Restoration of completely drained or filled wetland areas
- (d) Restoration of partially drained or filled wetland areas
- (e) Upland buffer areas (established or preserved)

- (f) Vegetative restoration of farmed wetlands
- (g) Wetland creations

If the above activities are not reasonably available to satisfy the entire replacement required by CMSCWD, the following additional activities, where they protect or improve the functions of wetlands shall be considered for replacement that exceeds the minimum replacement required by WCA:

- (a) Specified activities from the Spring Creek Corridor & Lower St. Croix River Stewardship Plans, CMWD Natural Resource Inventory, and MWMO Natural Resource Inventory
- (b) Protection and restoration of Groundwater Dependent Natural Resource recharge areas
- (c) Protection of high quality upland
- (d) Protection of landlocked basins
- (e) Protection and restoration of corridor connections

Those activities preserving wetland functions are eligible for 25% replacement credit on an area basis. Those activities restoring and preserving wetland functions are eligible for 50% replacement credit on an area basis.

If all above activities have been explored but are not reasonably available to meet, in full or in part, the replacement required above, that exceeds the minimum required by WCA, applicants must make payment into the Restoration Fund. Details of administration of the Restoration Fund are outlined in the District's Restoration Fund Guidelines presented in the next section.

#### **De Minimis**

This exemption, as set forth in Minnesota Rules 8420.0420 Subp. 8, is incorporated as part of this plan with the following amendment:

- (a) The maximum de minimis for District Wetland Management Category 1 and 2 wetlands, regardless of impact location and wetland type, is 20 square feet.

#### **Livestock Access**

Existing livestock access may continue as livestock access to the wetland, regardless of wetland Management Category. New livestock access is not allowed in Management Categories 1, 2, and 3 wetlands. New livestock access to a Management Category 4 wetland is allowed so long as the function, value, and quality of the wetland are not degraded. If wetlands in Management Categories 1, 2, or 3 have been used for Livestock Access 8 out of the last 10 years; the landowner is encouraged to apply for cost share monies from the CMSCWD's or WCD's Best Management Practices (BMP) program to establish best management practices and establish an alternative watering source. The CMSCWD is currently developing cost-share programs to encourage alternative watering sources and best management practices be met in these situations.

#### **Excavation**

Excavation is considered a wetland impact within the CMSCWD Wetland Management Plan for wetlands in all Management Categories 1 through 4. Excavation in a Management Category 4 wetland may be allowed if the activity meets the criteria of No Loss, per Minnesota Rules 8420.0415. Normal maintenance of stormwater ponds, existing ditches and channels is exempt from the excavation requirements if the maintenance activity meets the criteria of No Loss, per Minnesota Rules 8420.0415 or other applicable exemptions per Minnesota Rules 8420.0420.

### **Groundwater Dependent Natural Resource Protection**

A stormwater basin within the surface contributing area to a groundwater-dependent natural resource must contain and infiltrate the volume generated by a two-year, 24-hour storm event over the disturbed area, if feasible. The basin bottom must be at least three feet above the seasonally high water table, bedrock or other impeding layer. If this infiltration standard is not met, basin outflow must be non-erosive and routed through a subsurface system, flow spreader or other device that discharges water through or across the ground to lower discharge temperature to that of the ambient soil.

### **Water Quantity Alteration: Rate and Volume Standards**

For basins with outlets in the CMSCWD, the proposed discharge rate for developed conditions will be restricted to the pre-development 2-yr, 10-yr and 100-yr 24-hr storm event discharge rates as calculated per CMSCWD rules. Proposed discharge volumes will not increase stormwater flow volume from the site, as compared with the pre-development stormwater flow volume calculated in accordance with CMSCWD rules, for a 24-hour precipitation event with a return frequency of 2 years, or 10 years within a landlocked basin or a subwatershed draining to a landlocked basin. Note this refers to discharge to the wetland. This also pertains to any new discharge of pretreated stormwater from the site or into wetlands.

### **Water Quantity Alteration: Water Appropriation**

Altering the natural water levels of wetland basins is not an allowable practice for most areas of CMSCWD. Any type of water appropriation and/or dewatering practices is not allowed in High valued wetlands of Management Categories 1, 2, or 3. A variance for temporary dewatering impacts may be permitted if all other options have been exhausted.

### **Road Impacts**

Although qualifying township, city, or county road impacts may be mitigated outside of watershed under WCA (via the BWSR road replacement bank), the required replacement ratios and restoration fund payments would still apply. State roads and highways are exempt from the WMP's road impact rules, as they are controlled and administered by the **Minnesota Department of Transportation (MnDOT)** who is the WCA LGU for its projects; however the District strongly encourages MnDOT to comply with the conditions and intent of this Wetland Management Plan. Qualifying township, city, or county road impacts may be mitigated outside the District via the BWSR road replacement bank up to the ratios required by WCA. However, the balance of replacement required must be located within the District.

### **Wetland Delineations**

Wetland Delineations must be performed according to the joint BWSR/Corps 1996 guidance document "Guidelines for Submitting Wetland Delineations in Wisconsin to the St. Paul District Corps of Engineers" (Public Notice, 96-01078-SDE, May 22, 1996). Applicants are encouraged to consult with the LGU prior to the wetland delineation, especially in atypical situations, problem areas, and/or delineations based on inconclusive hydrology. It is incumbent upon the applicant to provide satisfactory documentation to support wetland boundaries, and that level of documentation is generally greater in atypical situations and/or seasonal wetlands, particularly relating to hydrology. The LGU will have final say as to the appropriate level of documentation.

Delineations should be submitted to the LGU with ample growing season remaining for review. This decision is at the discretion of the LGU, and therefore delineations MAY be reviewed outside of the official growing season if conditions allow for ample review of the data relevant to the wetland determination/delineation.

## 7. RESTORATION FUND GUIDELINES

### Goals and Objectives

Landowners needing to replace wetland impacts to an extent above and beyond WCA requirements as dictated by the Wetland Management Plan may make a payment into the Restoration Fund to meet in full or part the replacement requirement as. The District will keep track of the accumulated wetland credit debits and then complete projects to generate compensatory credit.

The Restoration Fund payment rate is set and periodically adjusted by the Board of Managers by formal resolution. Contributions to the Restoration Fund will be paid to, administered by, and held by the District, and will be used by the District for wetland restoration activities and other natural resource improvements that would restore, protect, and/or improve wetland function. All projects completed through the Restoration Fund should have a specific value to Natural Resources and have a certain level of monitoring to ensure that goals are met. The District will develop a monitoring plan for each project.

### Fund Establishment, Limits and Administration

The Restoration Fund fee will be established and periodically reviewed by the CMSCWD Board of Managers. The Restoration Fund fee charged will be based on the rate that is in effect at the time of permit approval. The Board may use the current fee BWSR charges for road bank replacement credits or other similar sources of information as guidance in establishing the Restoration Fund fees.

The amount of money in the Restoration Fund will fluctuate over time. Monies may be allowed to accumulate for pursuit of larger, more cost-effective activities. It is a goal of the CMSCWD that monies within the restoration fund will be utilized within a 5-year period provided that there are sufficient projects and funds available.

Restoration Fund fees will only be used for project costs (construction, monitoring, easements, etc.), not administration of the fund. The monies from the Restoration Fund may be allocated **District Wide** because the benefits of these activities extend beyond Community boundaries. In selecting projects, the District intends to meet the local obligation of wetland replacement and use its restoration fund monies in a cost effective manner to achieve the replacement obligation.

The District will take steps to ensure that project improvements will remain in perpetuity through protective easements or other similar protective legal documents.

### Eligible Restoration Fund Activities

Eligible activities for expenditure of restoration funds include those eligible replacement activities identified in “Section 6 Wetland Management Standards” and any other natural resource improvements that the District determines would restore, protect, and/or improve wetland function.

### Monitoring

The District will develop an appropriate monitoring plan for each project. Monitoring and inspection will provide feedback about the actual results and help evaluate the success of mitigation.

### Reporting and Evaluation

The Restoration Fund will be evaluated annually as part of the required Annual Reporting for the CMSCWD’s CWMP. The Restoration Fund reporting will be a separate component of the CWMP annual report. The CMSCWD will keep an active map of Restoration Fund projects updated annually.

## 8. BUFFER STANDARDS

Buffer strips of vegetation around wetlands are effective management tools for protecting wetland systems. Vegetated buffers provide cover and nesting habitat for wildlife, reduce erosion into the wetland, provide vegetative diversity, and reduce the amount of pollutants in runoff prior to discharge into a wetland.

Buffers are required around all preserved and replacement wetlands, with the average and minimum widths summarized in Table D-1 or as required by WCA, whichever is greater.

Wetland may not be filled for the purpose of buffer creation.

A buffer shall be indicated by permanent markers at the buffer's upland edge, with a design and text approved by District staff in writing.

**Table D-1.** Summary of Minimum Buffer Standards

Wetland Management Category	Average Buffer Width (feet)	Minimum Buffer Width (feet)
1	100	100
2	75	50
3	50	25
4	50	25

### Recreation Standards

Existing trails used for landowner access to wetlands are allowed to remain. However, continued use of existing trails will not be allowed if the trail is causing erosion or inhibiting the growth of vegetation. All new surfaces within the buffer zone must be pervious. Paved recreational trails must be located outside the buffer zone.

## 9. WETLAND PRESERVATION AREAS

**Wetland Preservation Areas (WPA's)** were chosen based on their high ranked wetland functions and local significance. These WPA's encompass those priority resources to be protected and enhanced for the future. Also, they provide a basis for decisions on avoiding, minimizing, and mitigating adverse impacts to wetlands.

Many of these designated WPA's would establish contiguous open space areas that protect the higher functioning aquatic resources in the watershed. A large body of literature supports the concept that larger contiguous blocks of natural area can support more plant and animal species compared to the same total area divided into smaller discontinuous parts. This concept is the basis for state and municipal natural resource managers focusing on the creation of greenway corridors and open space systems for natural resource protection. The intent is to create systems (greenways) that connect large blocks of open space. In addition to this working concept for natural resource planning, it is well known that many wetland habitat functions are only supported in a matrix of wetland and upland areas. The designation of these WPA's is designed to satisfy both of these working concepts for natural area and wetland preservation.



Wetland conservation, lower density development, Low Impact Development principles, and associated Best Management Practices are strongly encouraged, and lower density development zoning through WPA designation will be considered as required for the following areas) (Figure D-7):

#### Big Marine Park Reserve

Big Marine Park Reserve is located to the south of Big Marine Lake, largely within Washington County Parks ownership, and contains a large proportion of highly valued wetland complexes and natural areas.

#### German Lake and Surrounding Area

German Lake is located at the very northern portion of CMSCWD in the recently acquired “orphan area.” The lake itself is of very high value, as are the wetlands and upland oak forests adjacent to and associated with it.

#### Silver Creek Corridor

The Silver Creek Corridor (SCC) is located just north of the City of Stillwater within Stillwater Township (Figure II-1). It is located in the southern portion of the CMSCWD. The corridor extends from the Gateway Trail (north of Loon Lake) through a chain of small, high quality wildlife lakes. The lake chain includes Loon Lake, Silver Lake, Carol Lake, North Twin Lake and South Twin Lake. On the southern leg of the chain of lakes, the corridor crosses Highway 96 and extends to within ¼ mile of the Brown’s Creek Corridor. Silver Creek outlets from Carol Lake and flows east approximately two miles to the St. Croix River near the St. Croix Boom Site.

#### Carnelian Creek Corridor

The Carnelian Creek Corridor contains several important wetland complexes along its course before it outlets into Big Carnelian Lake, and as it connects Big Carnelian Lake to Little Carnelian Lake.

#### Between Bass Lake and County Road 7

The area between Bass Lake and County Road 7 contain several shallow lakes and associated wetland basins of relatively high value.

#### Barker Lake and Surrounding Natural Area

Barker Lake is located in the northwest portion of the watershed district, and is surrounded to the west by some very unique and high quality wetland basins.

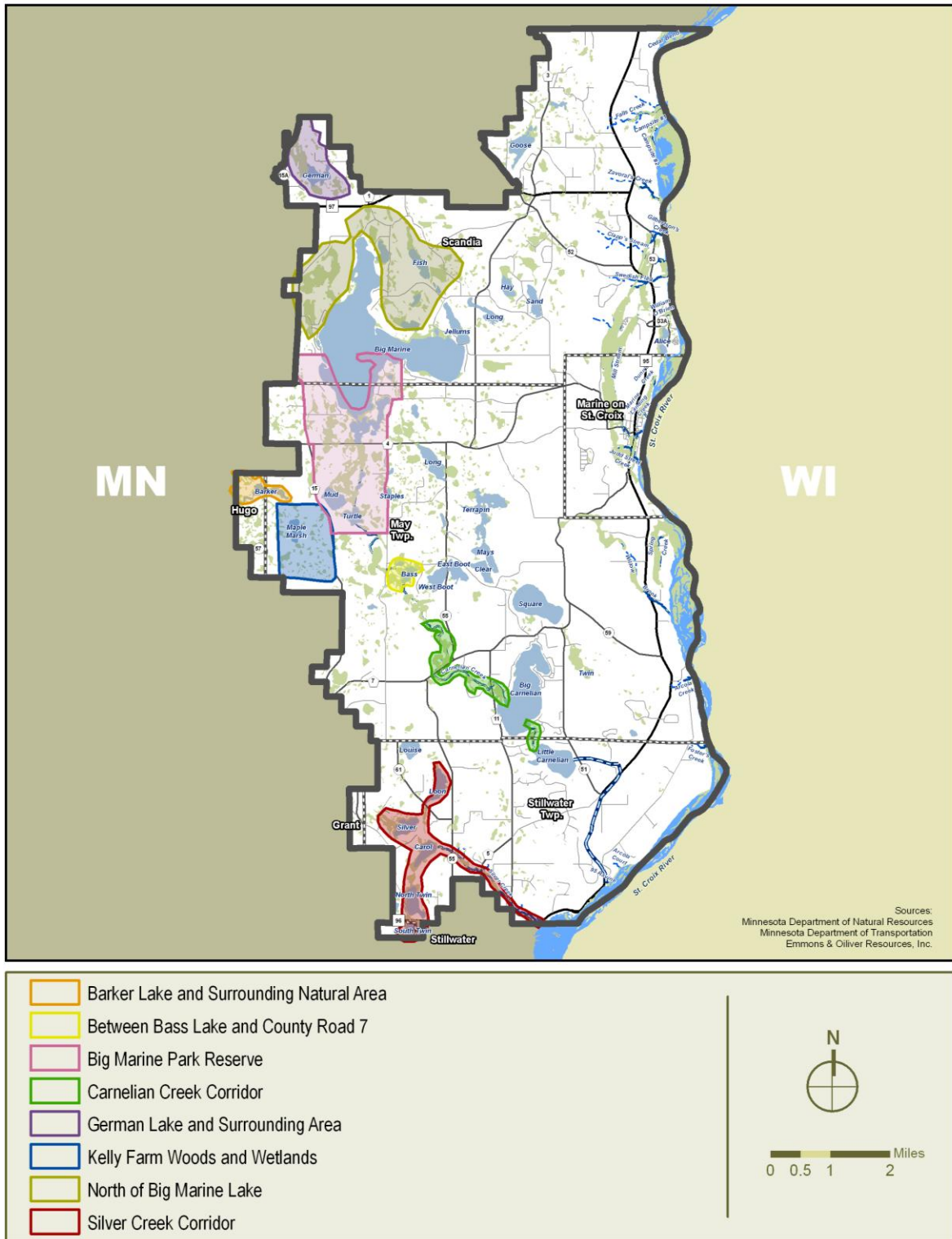
#### Kelly Farm Woods and Wetlands

Kelly Cattle Company contains scattered occurrences of very high valued wetland basins, surrounded by extensive forested and open space uplands.

#### North of Big Marine Lake

Several wetland complexes north and northwest of Big Marine Lake are of very high value, especially several tamarack seepage swamps.

**Figure D-7. Wetland Preservation Areas**



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## 10. REFERENCES

- Carnelian-Marine Watershed District 2000 Overall Plan. 2000.
- Eggers, Steve D. and D. Reed. 1987. Wetland Plants and Plant Communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St. Paul District. St. Paul, MN.
- Emmons & Olivier Resources, Inc. 2000. Mill Stream Association Natural Resource Inventory
- Emmons & Olivier Resources, Inc. 2003. Lower St. Croix River Spring Creek Stewardship Plan
- Emmons & Olivier Resources, Inc. 2001. Marine Watershed Management Organization Natural Resource Inventory
- Emmons & Olivier Resources, Inc. (EOR). 2003. Carnelian-Marine Watershed District Natural Resource Inventory and Management Plan.
- Emmons & Olivier Resources, Inc. 2003. Integrating Groundwater & Surface Water Management Northern Washington County. Prepared for Washington County, MN. October, 2003.
- Jacobsen, Robert L. 2005. Guidelines for restoring and managing native wetland vegetation. Minnesota Department of Transportation and Minnesota Board of Water and Soil Resources. March 2005.
- Marschner, F.J. 1975. The Original Vegetation of Minnesota (map). U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, MN.
- Metropolitan Council 2001. Minnesota Urban Small Sites BMP Manual – Stormwater Best Management Practices for Cold Climates. Barr Engineering. Metropolitan Council. St. Paul, MN.
- Metropolitan Council. 2004. 2030 Regional Development Framework. <http://www.metrocouncil.org/planning/framework/Framework.pdf>
- Minnesota Board of Water and Soil Resources. April 2004. Minnesota Routine Assessment Methodology for Evaluating Wetland Functions., Version 3.0.
- Minnesota Department of Natural Resources, 2004. Minnesota Land Cover Classification System User Manual Version 5.4. St, Paul, MN.
- Minnesota Natural Heritage Program. 1995. Element Occurrence Ranking Guidelines. Minnesota Department of Natural Resources.

- Minnesota Natural Heritage Program. 1990. Minnesota County Biological Survey of Washington, Minnesota. Minnesota Department of Natural Resources.
- Minnesota Natural Heritage Program. 1993. Minnesota's Native Vegetation: A key to natural communities, version 1.5. Minnesota Department of Natural Resources.
- Minnesota Natural Heritage Program. 1990. Minnesota County Biological Survey of Washington County, Minnesota. Minnesota Department of Natural Resources.
- Minnesota Division of Waters. Protected Waters Inventory for Anoka and Washington Counties, Minnesota. Minnesota Department of Natural Resources.
- Minnesota Geological Survey. 2005. Minnesota Groundwater Information Guide. <http://www.geo.umn.edu/mgs/gwig/index.html> July, 2005.
- Shaw, Daniel. 2000. Native vegetation in restored and created wetlands: its establishment and management in Minnesota and the upper Midwest. Minnesota Board of Water and Soil Resources. September, 2000.
- State of Minnesota Storm-Water Advisory Group. Storm-Water and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Storm-Water and Snow-Melt Runoff on Wetlands. 1997.
- Storm-Water and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Storm-Water and Snow-Melt Runoff on Wetlands. 1997. State of Minnesota Storm-Water Advisory Group.
- Svoboda Ecological Resources. 1996. Carnelian-Marine Watershed District Wetland Inventory.
- United States Army Corps of Engineers- Environmental Laboratory, 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.
- United States Department of Agriculture. 1980. Soil Survey of Washington and Ramsey Counties, Minnesota; USDA SCS in coop. with U of M Agricultural Experiment Station. April 1980.

## WETLAND MANAGEMENT PLAN APPENDIX I: Wetland Functional Assessment Scoring Protocol

### Landscape Scale Attributes

#### #14. Extent of Impervious in Drainage Area

Describes the dominant land use and condition of the immediate upland drainage area of wetland or within 500 feet of the wetland if the subwatershed area is not known:

**High** = Watershed conditions essentially unaltered; < 10% impervious (i.e. low density residential, >1 acre lots); land use development minimal, idle lands, lands in hay or forests or low intensity grazing.

**Medium** = Watershed conditions somewhat modified; e.g., 10–30 % impervious (i.e. medium density residential, 1/3 to 1 acre lots); moderate intensity grazing or haying with some bare ground; conventional till with residue management on moderate slopes, no-till on steep slopes.

**Low** = Watershed conditions highly modified; e.g., >30 % impervious surfaces (i.e. high density residential, lots smaller than 1/3 acre, industrial, commercial, high impervious institutional) maximizing overland flow to the wetland; intensive agriculture or grazing with a high amount of bare ground, no residue management on moderate or steep slopes, intensive mining activities.

#### #23. Buffer Width Class

Upland Buffer width: Average width of the naturalized buffer: \_\_\_\_\_ feet [Default maximum = 500']. Vegetated buffers around wetlands provide multiple benefits including wildlife habitat, erosion protection, and a reduction in surface water runoff. A buffer is an unmanicured upland area immediately adjacent to the wetland boundary. For this question, did not include lawn areas. If the buffer varied from one side to another, took the average width over the entire perimeter.

##### Widths for Water Quality:

**High** = >50 feet

**Medium** = 25 – 50 feet

**Low** = <25 feet

##### Widths for Wildlife Habitat:

**High** = >300 feet

**Medium** = 50 – 300 feet

**Low** = <50 feet

#### #38. Vegetative Interspersion Class

For wetlands that are characterized by multiple vegetative communities, the increased structural diversity and amount of edge associated with greater interspersion is generally positively correlated with wildlife habitat quality. For wetlands having more than one vegetative community, this indicates the interspersion category that best fits the wetland (see Appendix Fig. 2 of MnRAM 3.0):

**High** = Category 3

**Medium** = Category 2

**Low** = Category 1

**N/A** = Only one vegetative community is present.

#### #40. Interspersion

Describes the relative interspersion of various wetlands in the vicinity of the assessment wetland:

**High** = The wetland occurs in a complex of wetlands of various types (general guideline: at least 3 wetlands within 0.5 miles of assessment wetland, at least one of which has a different plant community than the assessment wetland); or the assessment wetland is the only wetland within a 2 mile radius and exhibits at least a moderate or greater plant community quality rating.

**Medium** = Other wetlands of the same plant community as the assessment wetland are present within 0.5 miles.

**Low** = No other wetlands are present within 0.5 miles of the assessment wetland but are present within 2 miles.

#### #41. Fragmentation

Habitat value diminishes when fragmented by barriers, which restrict wildlife migration and movement. Describe barriers present between the wetland and other habitats:

**High** = No barriers or minimal barriers present; i.e. low traffic; uncurbed roads, low density housing (> 1 acre lots), golf courses, utility easements, or railroads.

**Medium** = Moderate barriers present; i.e. moderately traveled; curbed roads, moderate density housing (1/3 to 1 acre lots), residential golf courses, low dikes.

**Low** = Large barriers present; i.e. 4-lane or wider, paved roads, parking lots, high-density residential (<1/3 acres), industrial and commercial development.

### **Community Scale Attributes:**

#### #13. Outlet Characteristics

"**Low**" for all wetlands with an excavated or enlarged outlet constructed below the bottom of the wet meadow zone; strong indications of subsurface drainage; outlet removes most/all long-term and temporary storage; or outlet changes hydrologic regime drastically.

"**Medium**" for all wetlands with a constructed, reduced capacity outlet below the top of the temporary wet meadow zone; moderate indications of subsurface drainage; outlet raised above the wet meadow zone if managed to mimic natural conditions; watercourse has been recently ditched/channelized.

"**High**" for wetlands with no outlet, natural outlet condition, or a constructed outlet at the historic outflow elevation; no evidence of subsurface drainage (drain tile).

#### #18. Sediment Delivery

“**Low**” for wetlands with major sediment delivery evidenced by buried detritus and/or vegetation along outer edge of temporary wetland (wet meadow) zone. Recent deltas, sediment plumes, etc. in areas of concentrated flow or sedimentation raising bottom elevation of wetland.

“**Medium**” for wetlands with minor evidence of accelerated sediment delivery in the form of stabilized deltas, sediment fans.

“**High**” for wetlands with no evidence of sediment delivery to wetland.

#### #20. Pollutant Discharge

“**High**” for all wetlands that receive significant volumes of untreated/undetained stormwater runoff, wastewater, or concentrated agricultural runoff directly, in relation to the wetland size.

“**Medium**” for all wetlands that have moderate levels of stormwater runoff, wastewater, or concentrated agricultural runoff in relation to wetland size, which have received some treatment (sediment removal) and runoff detention.

“**Low**” for wetlands that do not receive directed stormwater runoff, wastewater, or concentrated agricultural runoff; receive small volumes of one or more of these sources in relation to wetland size; or stormwater is treated to approximately the standards of the National Urban Runoff Program (NURP); and runoff rates controlled to nearly predevelopment conditions.

#### #28. Nutrient Loading

“**Low**” for wetlands with strong evidence of excess nutrient loading such as algal mats present or evidence of excessive emergent, submergent and/or floating macrophyte growth. (e.g. evidence of concentrated flow such as pipes, etc.)

“**Medium**” for wetlands with some evidence of excess nutrient loading source and evidence of plant communities such as dense stands of reed canary grass or narrowleaf, and/or blue (hybrid) cattail.

“**High**” for wetlands with no evidence of excess nutrient loading or nutrient sources (e.g. evidence of diverse, native vegetative community, no pipes, etc.).



## **Wildlife Habitat:**

### #15. Soil Integrity

“**Low**” for wetlands with evidence of significant disturbance or alteration to the wetland soils. Wetland receives conventional tillage most (>75%) years; or otherwise significantly impacted (e.g., fill, sediment deposits, cleared, excavated). Severe compaction, rutting, trampling, or excavation damage to wetland.

“**Medium**” for wetlands with moderate evidence of disturbance or alteration to the wetland soils. Temporary wet meadow zone tilled or heavily grazed most years. Zones wetter than temporary receive tillage occasionally. Some compaction, rutting, trampling, or excavation in wetland is evident.

“**High**” for wetlands with no signs or only minor evidence of recent disturbance or alteration to the wetland soils; temporary wetland wet meadow zone intact; idle land, hayed or lightly to moderately grazed or logged. Minimal compaction, rutting, trampling, or excavation damage to wetland.

### #26. Upland Buffer Slope

“**High**” for all wetlands with 0 - 6% (gentle) upland slopes

“**Medium**” for all wetlands with >6 - 12% (moderate) upland slopes

“**Low**” for all wetlands with >12% (steep) upland slopes

### #39. Litter Condition

“**N/A**” for deep marshes, shallow open water and bog communities.

“**Low**” for wetlands with no litter layer.

“**Medium**” for wetlands with some litter with apparent bare spots, or dense litter mat (e.g. reed canary grass mat).

“**High**” for wetlands with the presence of litter layer in various stages of decomposition.

## **Amphibian Habitat:**

### #42. Breeding Potential

“**1.0**” for all wetlands that are inundated long enough in most years to allow amphibians to successfully breed

“**0**” for all wetlands not inundated long enough in most years to allow amphibians to successfully breed

### #43. Predatory Fish

“**High**” for all wetlands that are isolated so that predatory fish (e.g. bass, northern pike, walleye, bluegill, perch, etc.) are never present.

“**Medium**” for all wetlands that may occasionally be connected to other waters so that predatory fish may be present in some years.

“**Low**” for all wetlands that are connected with a lake or river so that predatory fish are always present or the wetland is used for rearing of game fish.

#### #44. Overwintering

“**N/A**” for all wetlands that never or rarely contain standing water or is nearly always dry in winter

“**Low**” for all wetlands that are normally less than 1 meter deep and often freeze to the bottom

“**Medium**” for all wetlands that are normally around 1 meter deep (may occasionally winterkill)

“**High**” for all wetlands that are normally more than 1.5 meters deep (never or rarely winterkills)

#### #46. Adjacent Spawning Habitat

“**Exceptional**” = The wetland is a known spawning habitat for native fish of high importance/interest or the wetland is part of or adjacent to a trout fishery as identified by the DNR.

“**High**” = The wetland is lacustrine/riverine or is contiguous with a permanent water body or watercourse and may provide spawning/nursery habitat, refuge for native fish species in adjacent lakes, rivers or streams, or provides shade to maintain water temperature in adjacent lakes, rivers or streams.

“**Medium**” = The wetland is intermittently connected to a permanent water body or watercourse that may support native fish populations as a result of colonization during flood events, or the wetland is isolated and supports native, non-game fish species.

“**Low**” for all wetlands that are isolated from a permanent water body or watercourse or have exclusive, high carp populations which cause degradation to the wetland. These wetlands have standing water for at least a short time during the growing season.

“**N/A**” = The wetland does not have standing water at any time during the growing season.

#### Ground-Water Interaction

58. Describe the soils within the wetland:

Recharge = Mineral soils with a high organic content (all soils not included in discharge system).

Discharge = Organic/peat soils, formed due to more continuous wetness associated with a ground water discharge system

58. Guidance: Wetland Soils. Wetlands with mineral hydric soils typically represent drier hydrologic regimes where groundwater recharge is more likely (i.e. saturated, seasonally flooded, and temporarily flooded) where the wetness does not significantly limit oxidation of organic materials. Groundwater discharge wetlands represent more stable and permanent hydrologic regimes where excessive wetness limits the oxidation of organic matter resulting in the accumulation of peat and/or muck. In addition, coarser grained mineral hydric soils may have higher permeabilities allowing groundwater recharge, while histosols generally have low permeabilities, reducing groundwater discharge. Disturbed soils in excavated wetlands or stormwater ponds are subject to best professional judgment for this question.

59. Describe the land use/runoff characteristics in the subwatershed upstream of the wetland:

Recharge = Land is primarily developed to high-density residential, commercial, industrial and road land uses (equivalent to lots 1/4 acre or smaller) indicating impervious surfaces (>38%), which result in more runoff to wetlands and lowered water tables creating a gradient for recharge under wetlands.

Discharge = Upland watershed primarily undeveloped or with low to moderate density residential development (i.e. lots larger than 1/4 acre) with low percentage of impervious surfaces (<38%) so upland recharge (to groundwater) and higher water table will be more likely to contribute discharge to wetlands.

59. Guidance: Land Use/Runoff. Watersheds with extensive paved surfaces, topographic disruptions, and the presence of wells are associated with human development that lowers the potentiometric contours. Lowered or diversified potentiometric contours enhance the likelihood of recharge, not discharge. Wetlands with unpaved watersheds are more likely to allow groundwater discharge to occur.

60. Indicate conditions that best fit the wetland based on wetland size and the hydrologic properties of the soils within 500 feet of the wetland.

Recharge = Wetland is <200 acres and surrounding soils (within 500 feet) are primarily in the C or D hydrologic groups.

Discharge = Wetland is >200 acres in size or wetland is <200 acres and the surrounding soils (within 500 feet) are primarily in the A or B hydrologic groups.

60. Guidance: Wetland Size and Surrounding Soils. The size or area of the wetland and the soil texture in the surrounding upland are two factors controlling the wetland's water budget. A large wetland with a proportionately small watershed may indicate subsidization of its water budget by groundwater discharge. The probability of groundwater discharge occurring may, thus increase as the wetland/watershed ratio increases. The wetland size also controls the amount of recharge potential. The more fine-grained the soil texture in the surrounding uplands, the more water will flow to the wetland via overland flow and less likely water is to flow to the wetland via groundwater discharge. Williams (1968) observed that a small wetland situated in a large watershed favored groundwater recharge, because surface water inflow from a large watershed was sufficient to create a water mound conducive to recharge. Sandy and loamy upland soils allow more infiltration of precipitation than clayey soils. The infiltrated water will percolate downward vertically and/or flow laterally becoming groundwater discharge where wetlands intersect the water table.

61. Indicate the hydroperiod of the wetland:

Recharge = Cowardin et al. water regimes: A, C, D, E, and J (i.e. temporarily flooded, seasonally flooded, seasonally flooded/well drained, seasonally saturated, and intermittently flooded as well as wetlands with the B regime (saturated) that: (1) are on flats; and/or (2) are acid bogs (indicates precipitation-driven systems).

Discharge = Cowardin et al. water regimes: F, G, H, (i.e. semi-permanently flooded, intermittently exposed, and permanently flooded), as well as wetlands with the B water regime (saturated) that: (1) consist of sloping organic soils; (2) are on a river valley terrace or at the toe of a bluff or beach ridge, etc.; or (3) have any observed springs or seepages.

61. Guidance: Hydroperiod. Permanently flooded, semi-permanently flooded, and saturated water regimes, especially in regions having high evaporation rates, often indicate groundwater discharge to a wetland. Exceptions are saturated wetlands on flats and/or bogs that are precipitation-driven systems. Wetlands that are seasonally- or temporarily-flooded are more likely to recharge groundwater.

62. Describe the inlet/outlet configuration that best fits the wetland:

Recharge = No outlet or restricted outlet in natural wetlands and lacustrine wetlands.

Discharge = Perennial outlet but no perennial or intermittent stream inlet; or perennial stream riverine wetland.

62. Guidance: Inlet/Outlet for Groundwater. A wetland with a permanent stream inlet but no permanent outlet is more likely to recharge groundwater than one with an outlet. Several factors support this ranking. First, a higher hydraulic gradient will likely be present in an area with no outlet, especially if an inlet is present. Second, the longer water is retained in an area, the greater the opportunity for it to percolate through the substrate. Third, wetlands without outlets generally experience more water-level fluctuations, resulting in inundation of unsaturated soils. Finally, lack of an outlet suggests that water is being lost either through recharge or evapotranspiration, especially if an inlet is present. A wetland with a permanent outlet and no inlet is more likely to discharge groundwater than one with other combinations of inlets and outlets. Continuous discharge of water (i.e. permanent outlet) without surface water feeding the wetland through an inlet suggests an internal source of groundwater (e.g. springs or seeps). Flow-through wetlands would be considered discharge wetlands for the purposes of this question.

63. Characterize the topographic relief surrounding the wetland:

Recharge = Land slopes away from (below) the wetland (wetland is elevated in the subwatershed).

Discharge = Topography characterized by a downslope toward the wetland around the majority of the wetland (wetland is found lower on the landscape).

63. Guidance: Topographic Relief. Groundwater discharge is more likely to occur in areas where the topographic relief is characterized by a sharp downslope toward the wetland (i.e. wetland is located at the toe of a slope). Groundwater recharge is more likely in wetlands where the topographic relief is characterized by a sharp downslope away from most of the wetland. The slope of the water table with respect to the wetland influences the hydraulic gradient for groundwater movement. The water table usually slopes roughly parallel to the land surface topography. Thus, when local topography slopes sharply toward the wetland, the result is typically a hydraulic gradient favorable for groundwater discharge.

#### #99 Natural Heritage Program Vegetative Community Ranking

**N/A** for all wetlands with no vegetative quality information available

**“Low”** for all wetlands that ranked with NHP scores “D” or “C/D” and for all MLCCS polygons with vegetative quality “low.”

**“Medium”** for all wetlands that ranked with NHP scores “C” and for all MLCCS polygons with vegetative quality “medium.”

**“High”** for all wetlands that ranked with NHP scores “B/C”, “B”, “A/B” and “A” and for all MLCCS with polygons vegetative quality “high.”

Please refer to the “Wetland Plant Community Ranking Criteria” presented in Appendix II for greater clarification on how these Community Rankings were completed.

### Special Features:

The following letters refer to Special Feature elements for the MnRAM analysis that can have a final impact on wetland functional scoring – but they are not addressed in specific MnRAM question #'s.

- a. Designated trout streams or trout lakes (see MnDNR Commissioners Order 2450 Part 6262.0400 subparts 3 and 5) (if yes, Fishery Habitat Rating is Exceptional):
- b. Calcareous fen (Special Status see MN Rule Chapter 7050) (If yes, Vegetative Diversity/Integrity functional rating is Exceptional):
- c. Designated scientific and natural area (if yes, Aesthetics/ Recreation/ Education/ Cultural rating is Exceptional):
- d. Rare natural community (refer to MnDNR County Biological Survey/Natural Heritage) (If yes, Vegetative Diversity/Integrity is Exceptional):
- e. High priority wetland, environmentally sensitive area or environmental corridor identified in a local water management plan:
- f. Public park, forest, trail or recreation area:
- g. State or Federal fish and wildlife refuges and fish and wildlife management areas; (If yes, then Wildlife and/or Fishery Habitat functional rating is Exceptional):
- h. Archeological or historic site as designated by the State Historic Preservation Office; (If yes, then Aesthetics/Recreation/Education/Cultural functional rating is Exceptional):
- i. Federal or state listed endangered or threatened plant species or species of concern in the wetland or known adjacent lands. If yes, list the species of concern: (If yes, then Vegetative Diversity functional rating is Exceptional):
- j. Federal or state listed endangered or threatened wildlife species or species of concern in or using the wetland or known adjacent lands. If yes, list the species of concern: (If yes, then question 35 is yes, and Wildlife Habitat functional rating is Exceptional):
- k. Local Shoreland Management Plan area:
- l. State Coastal Zone or Shoreland Management Plan area:  
Shoreland area identified in a zoning ordinance (generally within 1000 feet from a water basin and 300 feet from a watercourse):
- n. Floodplain area identified in a zoning ordinance or map:
- o. Wetland restored or preserved under a conservation easement.
- p. Wetland restored or created for mitigation purposes
- q. Wellhead Protection Areas:
- r. Sensitive ground-water area:
- s. State or Federal designated wild and scenic river
- t. Federally identified special area management plan, special wetland inventory study, or an advanced delineation and identification study:
- u. State or Federal designated wilderness area:

### Special Features Protocol:

- Obtained the above special feature shapefiles for the study area.
- Unioned all special feature shapefiles into one shapefile.

WCA 8420.0548 describes "Special Considerations" which are covered by the "Special Features" from MNRAM except for "Subp. 9. Waste Disposal Sites."

**Table D-2.** Wetland Functional Assessment Table

Wetland Functions	Attributes Used to Assess Function	Source
A. Maintenance of Characteristic Hydrologic Regime	Outflow control	13
	Impervious drainage area	14
	Soil integrity	15
	Pollutant discharge	20
B. Flood/Stormwater/Attenuation	Outflow control	13
	Impervious drainage area	14
	Soil integrity	15
	Sediment delivery	18
C. Downstream Water Quality	Pollutant discharge	20
	Outlet control	13
	Impervious drainage area	14
	Sediment delivery	18
	Pollutant discharge	20
	Upland buffer width for Wildlife	23a
	Upland Buffer Slope	26
D. Maintenance of Wetland Water Quality	Vegetative integrity	99 NHP Grade
	Sediment delivery	18
	Pollutant discharge	20
	Upland buffer width for WQ	23b
	Upland Buffer Slope	26
	Nutrient loading	28
E. Maintenance of Characteristic Wildlife Habitat Structure	Vegetative integrity	99 NHP Grade
	Outflow control	13
	Pollutant discharge	20
	Upland buffer width for WL	23a
	Litter	39
	Wetland Interspersion	40
	Fragmentation	41
F. Maintenance of Characteristic Amphibian habitat	Vegetative integrity	99 NHP Grade
	Impervious drainage area	14
	Sediment delivery	18
	Pollutant discharge	20
	Upland buffer width for WL	23a
	Signs of nutrient loading	28
	Breeding potential	42
	Predatory fish pressure	43
	Overwintering	44
G. Maintenance of Characteristic Fish Habitat	Vegetative integrity	99 NHP Grade
	Score of "D. Maintenance of Water Quality"	18,20,23b,26,28, NHP Grade
H. Ground-water Interaction	Spawning	46
	Wetland Soils	58
	Subwatershed Land Use	59
	Wetland Size and Upland Soils	60
	Wetland Hydrologic Regime	61
	Inlet/Outlet Configuration	62
	Upland Topographic Relief	63

## **WETLAND MANAGEMENT PLAN APPENDIX II: Wetland Plant Community Quality Ranking Criteria**

### **Vegetative Diversity and Integrity**

Vegetative diversity and integrity is the measure of the wetland compare to a “pristine” or presettlement wetland plant community. Diversity refers to the amount of plant species present, and integrity refers to whether or not the plant species should be present within the wetland community. This assessment is specific to each wetland community. The “Exceptional Quality” rating applies to all wetland communities, but the “High”, “Moderate”, and “Low” ratings are determined specifically for each wetland community.

#### Exceptional Quality:

Plant communities undisturbed, or sufficiently recovered from past disturbances, such that they represent pre-European settlement conditions. Non-native plant species are absent or, if present, constitute a minor percent cover of the community. Rare, threatened and/or endangered species (consider both State and Federal listings) may be present. Unique features (e.g., patterned peatlands, virgin prairie, old growth forests) may also be present.

#### **Shallow, open water communities**

High Quality: Diverse aquatic bed communities dominated by 3 or more species of native aquatic plants such as pondweeds, water lilies, bladderworts, wild celery, duckweeds, water crowfoots, native milfoils, etc.

Moderate Quality: Dominated by 1 or 2 species of native aquatic plants.

Low Quality: Dominated by Eurasian water milfoil; or no aquatic vegetation present.

#### **Deep and shallow marshes**

High Quality: Dominated by a diverse assemblage (3 or more species) of native aquatic plants (e.g., bur-reeds, bulrushes, arrowheads, cattails, sweet flag, pondweeds). Cattails comprise less than 40 percent cover. Purple loosestrife absent or comprises less than 5 percent cover.

Moderate Quality: Dominants include at least 2 species of native aquatic plants, often arranged in a band or interspersed as patches. Purple loosestrife, if present, comprises less than 25 percent cover. Cattail, if present, comprises 40 to 85 percent cover.

Low Quality: Purple loosestrife comprises more than 25 percent cover; or cattail comprises more than 85 percent cover.

#### **Sedge meadows**

High Quality: Stands of sedges with 5 or more species of native forbs. Grazing, haying, artificial drainage, stormwater input, excavation and/or impoundment absent or minimal. Reed canary grass, purple loosestrife and/or stinging nettle absent or cumulatively comprise less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.

Moderate Quality: Stands of sedges subjected to moderate degree of the disturbances listed above. Two to 4 species of native forbs present. Reed canary grass, purple loosestrife and/or stinging nettle cumulatively comprise less than 40 percent cover. Buckthorn absent or comprises less than 30 percent cover.

Low Quality: Stands of sedges highly impacted by grazing, haying, artificial drainage, stormwater input and/or cropping. Reed canary grass, purple loosestrife and/or stinging nettle cumulatively comprise more than 40 percent cover; and/or buckthorn, if present, comprises greater than 30 percent cover.

### **Wet meadows**

High Quality: Composed of a diverse assemblage (10 or more species) of native grasses, sedges, rushes and/or forbs. Reed canary grass, if present, comprises less than 20 percent cover. Purple loosestrife absent or comprises less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.

Moderate Quality: Community moderately impacted by disturbances (e.g., haying, grazing) and composed of 5 to 9 species of native grasses, sedges, rushes and/or forbs. Reed canary grass comprises less than 40 percent cover. Purple loosestrife, if present, comprises less than 20 percent cover. Buckthorn, if present, comprises less than 30 percent cover.

Low Quality: Community highly impacted such that reed canary grass comprises more than 40 percent cover; and/or purple loosestrife comprises greater than 20 percent cover; and/or buckthorn, if present, comprises greater than 30 percent cover; and/or vegetation is frequently removed by cropping.

### **Wet to wet-mesic prairies**

High Quality: Community composed of native grasses (e.g., prairie cord-grass, Canada bluejoint grass), sedges, and forbs characteristic of wet to wet-mesic prairies. Site is undisturbed or minimally disturbed by cropping, grazing, haying, and/or artificial drainage. Reed canary grass, purple loosestrife, quack grass and/or Canada thistle absent or cumulatively comprise less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.

Moderate Quality: Community subjected to moderate degree of disturbances listed above. Reed canary grass, purple loosestrife, quack grass and/or Canada thistle cumulatively comprise less than 40 percent cover. Buckthorn absent or comprises less than 30 percent cover.

Low Quality: Community highly disturbed by activities listed above and reed canary grass, purple loosestrife, quack grass, Canada thistle and/or other undesirable species cumulatively comprise more than 40 percent cover; and/or buckthorn, if present, comprises greater than 30 percent cover; and any frequently cropped wet to wet-mesic prairie.

### **Calcareous fens**

High Quality: Composed of the characteristic assemblage of calcium tolerant or opportunistic species. Community undisturbed or with minimal disturbances such as artificial drainage, ground-water pumping, grazing, filling, excavation, etc. Rare, threatened or endangered species often present. Reed canary grass, *Phragmites*, purple loosestrife and/or stinging nettle absent or cumulatively comprise less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.



Moderate Quality: Community moderately impacted by disturbances listed above. Reed canary grass, *Phragmites*, purple loosestrife, stinging nettle and/or cattail cumulatively comprise less than 40 percent cover. Buckthorn absent or comprises less than 30 percent cover.

Low Quality: Community highly impacted by the disturbances listed above. Reed canary grass, *Phragmites*, purple loosestrife, stinging nettle and/or cattail cumulatively comprise more than 40 percent cover; and buckthorn, if present, comprises greater than 30 percent cover.

### **Shrub-carrs**

High Quality: Community undisturbed or minimally disturbed by artificial drainage, grazing, filling or impoundment. Dominated by native shrubs (e.g., dogwoods, willows) with a groundlayer stratum composed of five or more species of native grasses, sedges, rushes and/or forbs. Buckthorn, honeysuckle and/or box elder, if present, cumulatively comprise less than 10 percent cover. Reed canary grass, if present, comprises less than 10 percent cover.

Moderate Quality: Community moderately impacted by the disturbances listed above. One of two types: (1) shrub canopy composed of native species with a nearly monotypic reed canary grass groundlayer; or (2) shrub canopy composed of up to 50 percent non-native or disturbance indicator species (e.g., buckthorn, honeysuckle, box elder) with a groundlayer stratum composed of less than 5 species of native grasses, sedges, rushes and forbs; reed canary grass may be present but comprises less than 50 percent cover.

Low Quality: Community highly impacted by the disturbances listed above. Buckthorn, honeysuckle and/or box elder comprise more than 50 percent canopy cover and the groundlayer stratum is composed of greater than 50 percent cover of reed canary grass or non-native grasses/forbs.

### **Alder thickets**

High Quality: Community undisturbed or minimally disturbed by artificial drainage, grazing, filling, impoundment, etc. Non-native shrubs (e.g., buckthorn), if present, comprise less than 10 percent cover. Groundlayer stratum may be depauperate or composed of native grasses, sedges, rushes, ferns and/or forbs. Reed canary grass, if present, comprises less than 10 percent cover.

Moderate Quality: Community moderately impacted by the disturbances listed above. Non-native and/or disturbance indicator shrubs (e.g., buckthorn, box elder, honeysuckle) cumulatively comprise less than 40 percent cover. The groundlayer stratum, if present, has less than 50 percent cover of reed canary grass.

Low Quality: Community highly impacted by the disturbances listed above with greater than 40 percent cover contributed by buckthorn, box elder and/or honeysuckle; and/or reed canary grass comprises more than 50 percent cover of the groundlayer stratum.

### **Hardwood swamps and coniferous swamps**

High Quality: Stands undisturbed or minimally disturbed by artificial drainage, grazing, logging, impoundment, filling, etc. Seedlings and/or saplings of native tree species evident indicating regeneration. Groundlayer stratum composed of native grasses, sedges, rushes, ferns and/or forbs. Box elder, buckthorn and/or reed canary grass, if present, each comprise less than 10 percent cover.

Moderate Quality: Stands moderately impacted by the above disturbances. Disturbance indicator species such as box elder, quaking aspen and/or eastern cottonwood comprise up to 50 percent cover of tree and sapling strata. Shrub stratum has less than 40 percent cover of buckthorn. Groundlayer stratum has less than 50 percent cover of reed canary grass.

Low Quality: Stands highly impacted by the disturbances listed above. Box elder, quaking aspen, eastern cottonwood, buckthorn and/or reed canary grass comprise more than 50 percent cover in 2 or more strata (e.g., tree, sapling, shrub, groundlayer). Few to no indications of regeneration of native tree species.

### **Floodplain forests**

High Quality: Stands undisturbed or minimally disturbed by artificial drainage, grazing, logging, diking, impoundment, filling, catastrophic flood events, etc. Groundlayer stratum, if present, composed of native forbs/graminoids characteristic of floodplain forests: wood nettle, jewelweed, Virginia rye, cut-leaf coneflower, etc.

Moderate Quality: Stands moderately impacted by the disturbances listed above.

Low Quality: Stands highly impacted by the disturbances listed above. Indicators include high proportion of dead and/or dying native tree species.

### **Seasonally flooded basins**

High Quality: Located within an area of permanent vegetative cover (e.g., forest, prairie, non-agricultural settings) undisturbed or minimally disturbed by artificial drainage, haying, grazing, plowing, stormwater input, or other disturbances.

Moderate Quality: Moderately impacted by the above disturbances -- e.g., partially drained, infrequently cropped, subject to some stormwater input, etc.

Low Quality: Located in frequently cropped agricultural fields or subjected to substantial inputs of stormwater, or other disturbances.

## WETLAND MANAGEMENT PLAN APPENDIX III: Definitions

**Agricultural activity** - means the use of land for the production of agronomic, horticultural or silvicultural crops, including nursery stock, sod, fruits, vegetables, flowers, forages, cover crops, grains, and Christmas trees. Agricultural activity also includes grazing.

**Buffers** - these separate the resource from urban and agricultural areas to ensure that mitigation performance is met; and provide habitat functions

**Compensatory mitigation alternatives** - the alternative of banking may be considered when site conditions are not feasible for functional replacement; the bank site is required to meet the landscape function requirements under the CMSCWD WMP and in-kind replacement when the resource is regionally important

**De minimis** - Amount of wetland filling or draining allowed without replacement as a part of an approved project.

**Development** - the placement of one or more structures or surfaces on a single parcel, or on contiguous parcels pursuant to a common scheme.

**Enhancement** - for either undisturbed or degraded wetland; specific functions are increased and possibly some functions are decreased and there can be a decline in other wetland functions; no gain in area

**Grandfathered** - A provision that exempts those already involved in a regulated activity or business from the new regulations established by the statute.

**Impervious surface** - a surface that has been compacted or covered with a layer of non-porous material, or is likely to become compacted from expected use, so that it is highly resistant to infiltration by water. Examples of impervious surface include roads, driveways and parking areas, whether or not paved, sidewalks greater than 3 feet wide, patios, tennis and basketball courts, swimming pools, covered decks and other structures.

**MnRAM - Minnesota Routine Assessment Method (for Evaluating Wetland Functions)** - A State-recognized wetland functional capacity assessment methodology.

**NURP standard** - the design criteria developed pursuant to the Nationwide Urban Runoff Program (U.S. EPA, 1983) and published by the Minnesota Pollution Control Agency in "Protecting Water Quality in Urban Areas 1991."

**Pre-development** - at the time preceding creation of any impervious surface or substantial change in site hydrology or infiltration by alteration of site vegetation, or contour, or perviousness.

**Restoration** - return natural or historic functions to a degraded wetland

**Sequencing Requirements** - requirements as outlined in rules set forth under 8420.0520 "Sequencing":

Subpart 1. Requirement. The local government unit may not consider or approve a wetland replacement plan unless the local government unit finds that the applicant has demonstrated that the activity impacting a wetland has complied with all of the following principles in descending order or priority:

A. **avoids** direct or indirect impacts to the wetland that may destroy or diminish the wetland under the criteria in subpart 3;

B. **minimizes** the impact to the wetland by limiting the degree or magnitude of the wetland activity and its implementation under the criteria in subpart 4;

C. **rectifies** the impact by repairing, rehabilitating, or restoring the affected wetland under the criteria in subpart 5;

D. **reduces** or eliminates the impact to the wetland over time by preservation and maintenance operations under the criteria in subpart 6; and

E. **replaces** unavoidable 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 defined in this Wetland Management Plan.

**Steep slope** - land with an average slope exceeding 12 percent over a distance of 50 feet or more or land defined as steep slope in the Washington County Soil Survey, as amended.

**Structure** - anything that is constructed or placed on the ground and that is, or is intended, to remain for longer than a brief, temporary period of time.

**Subwatershed** - the drainage area of the receiving water for the site.

**Upland areas** - areas for which enhancement of functions and overall ecological functioning of a mitigation area is increased; these affect the overall amount of credit for the mitigation project; the associated aquatic resource must be considered important to the region AND would be under demonstrable threat from human activities

**Waterbody** - a watercourse or waterbasin.

**Waterbasin** - an enclosed natural depression with definable banks, capable of retaining water.

**Wetland** - land transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. A wetland (a) is predominated by hydric soils; (b) is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and (c) under normal circumstances, supports a prevalence of hydrophytic vegetation. A wetland is a waterbasin if it meets the definition of that term.

**Wetland Conservation Act** - means 1991 Minn. Laws ch. 354, as amended by 1993 Minn. Laws ch. 627, Laws 2008, chapter 368, and by any subsequent amendments.

**Wetland Credit** - means wetland replacement credit that can be used for any portion of wetland replacement.