

Wetland Management Classification System

To accompany the Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.0

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1.0 Wetland Management Recommendations

This document is a companion to the *Minnesota Routine Assessment Method for Evaluating Wetland Functions* (MnRAM) [version 3.0 or later]. It is meant to provide a basis for developing wetland management recommendations from data gathered in the field. The objective of a wetland management classification system and management standards is to achieve no net loss of wetland functions and values within the management area while providing flexibility for economic development that may require wetland impacts. Impacts to wetlands include not only direct impacts such as filling, draining, and excavating, but also indirect impacts from stormwater inputs, changes to local surface and ground water hydrology, and pollutant loading.

The wetland protection process begins with an inventory and field assessment of all wetlands within the management area. The wetland inventory should identify wetlands by type (Circ. 39 or Cowardin), size, location and landscape setting, and wetland functions. Wetland assessment evaluates functional capacity, both existing and potential, based on inventory information as well as: vegetative community, soils, hydrology, ecologic characteristics, and cultural uses. Following completion of this assessment, each wetland can be assigned to a recommended management class based on the wetland's current and potential functions as well as the evaluation of local critical wetland resources and the wetland's susceptibility to stormwater degradation (Table 1.1). Each wetland can be classified according to a recommended level of wetland protection and acceptable hydrologic changes (Table 1.2).¹

1.1 Wetland Management Classification

With data for each wetland in the assessment area complete, the functional indices can then be used to classify the wetlands. This guidance document presents two classification standards based on expert wetland recommendations and concepts² and in compliance with the state Wetland Conservation Act³, state water quality standards⁴, and various wetland management plans from both metropolitan and rural Minnesota areas.

Suggested classification schemes offered are for Basic Protection and Increased Protection standards; local authorities can choose a management classification level based on local resource needs and preferences. The Basic Protection Standard (Figure 1.1) is the minimum recommended level that will satisfy no-net-loss goals, protect critical resources, and allow for use of some wetlands in development zones. The Increased Protection Standard will include more wetlands in the Preserve category that might otherwise fall into Manage 1, thereby protecting less-than-pristine wetlands in areas that are at an increased risk for wetland impact, whether direct; outright loss by development pressures or indirect; ecological impact from increased use or hydrologic changes.

¹ Based largely on the state guidance document *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, 1997.

² Some of which are presented in *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, 1997.

³ Minn. Rules Chap. 8420.

⁴ Minn. Rules Chap. 7050.

These two options are offered as a starting point for regional decision-making. Any final policy will need to take into account how current and predicted pressures affect the landscape. An initial evaluation of the effect of both standards will give an indication how the local wetland manager can adapt an individual strategy to maximize resource protection while retaining development benefits to their community. Using GIS-mapping tools will be invaluable for this evaluation.

Using this system will classify a wetland into one of four categories: Preserve, Manage 1, Manage 2, or Manage 3. The Preserve category is for exceptional and highest-functioning wetlands or those sensitive wetlands receiving conveyed storm water runoff that have yet retained a medium level of vegetative diversity/integrity. These wetlands are those that should be preserved in (or improved to) their most pristine or highest functional capacity with wide, natural buffers, in perpetuity. In the Manage 1 category are high-quality wetlands that should be protected from development and other pressures of increased use, including indirect effects. Maintaining natural buffers will help to retain the significant function these wetlands provide. In the event that impacts to these wetlands cannot be avoided, replacement ratios for mitigation should exceed the state-required minimums. Manage 2 wetlands provide medium functional levels and the wetland extent should be maintained. These wetlands often provide optimal restoration opportunity. Manage 3 wetlands have been substantially disturbed; replacement considerations can be minimized⁵ after proper sequencing.

Using the Flowchart

The process can be followed in Figures 1.1 [Basic Standard] and 1.2 [Increase Protection Standard]. Begin at the top and follow the arrows and numbered boxes through the diagram until all of the wetlands have been placed in a management category. Find all wetlands that are classified as Critical Resources, as described in Section 2.0; those wetlands are classified in the Preserve category. Wetlands determined to not fit any of the Critical Resources categories are then classified into one of the four management class groups. The suggested wetland management criteria that could be applied to wetlands within each management class are provided in Table 1.1.

⁵ Replacement minimized down to a 1:1 ratio (in the counties with less than 50 percent of their historic wetlands) or lower (in counties with more than 50 percent of their historic wetlands).

Table 1.1
Recommended Wetland Management Standards
Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.0

Management Class	Management Strategy	Stormwater Treatment	Buffer ¹	Mitigation Standard	Hydrologic Guidelines
A—Preserve	Maintain wetland and existing functions, values and wildlife habitat. Possible need for active management of wetland to protect unique features. Apply strict avoidance standards. May be appropriate to develop a conservation easement.	Avoid conveyed flows where prudent and feasible. Upstream sediment and nutrient pretreatment required to maintain background loading rates. Maintain existing hydrology—divert increased flows. Avoid concentrating flows.	≥50 feet for water quality ≥100 feet for wildlife habitat. ² Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio with documented replacement of functions/values. Consider requiring buffer replacement.	<u>Bounce (10 yr)</u> : Existing <u>Inundation (1 & 2 yr)</u> : Existing <u>(10 yr)</u> : Existing <u>Runout Control</u> : ³ No Change Maintain existing hydrology. Encourage infiltration and reduced impervious BMPs. Conduct water budget analysis.
B—Manage 1	Maintain wetland without degrading existing functions, values and wildlife habitat. Apply WCA sequencing process.	Pretreat conveyed flows to maintain background loading rates.	35-50 feet Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio. Replacement of functions and values on site or in location specified in plan for drain/fill/excavation impacts. In compliance with Ch. 7050 the entire area affected by storm water or other wastewater flows must be avoided, minimized and replaced at a replacement ratio of 1:1 for all changes in wetland type.	<u>Bounce (10 yr)</u> : Existing + 0.5 ft <u>Inundation (1 & 2 yr)</u> : Existing plus 1 day <u>(10 yr)</u> : Existing + 7 days <u>Runout Control</u> : ² No Change Maintain existing hydrology. Encourage infiltration and reduced impervious BMPs.
C—Manage 2	Maintain wetland footprint. Improve wetland biological and plant community diversity/integrity or enhance other functions if possible. Apply WCA sequencing process. Consider for restoration.	Pretreat all conveyed discharges to remove all heavy particles and maximize removal of fine grained sediment prior to discharging to the wetland	25-35 feet Require monuments to mark buffer edge.	WCA minimum replacement of acreage and functions/values on site or in location specified in plan for drain/fill/excavation impacts In compliance with Ch. 7050 the entire area affected by storm water or other wastewater flows must be avoided, minimized and replaced at a replacement ratio of 1:1 for all changes in wetland type.	<u>Bounce (10 yr)</u> : Existing + 1.0 ft <u>Inundation (1 & 2 yr)</u> : Existing plus 2 days <u>(10 yr)</u> : Existing + 14 days <u>Runout Control</u> : ² 0 to 1.0 ft above existing runoff
D—Manage 3	Allow for relaxed sequencing and replacement plan flexibility. Consider for restoration/enhancement.	Pretreat all conveyed flows to remove all medium grained and larger sediments.	25 feet	WCA allows mitigation flexibility with minimum standards required in the plan area, see M.R. 8420.0650. In compliance with Ch. 7050 the entire area affected by storm water or other wastewater flows must be avoided, minimized and replaced at a replacement ratio of 1:1 for all changes in wetland type.	<u>Bounce (10 yr)</u> : No Limit <u>Inundation (1 & 2 yr)</u> : Existing plus 7 days <u>(10 yr)</u> : Existing + 21 days <u>Runout Control</u> : ² 0 to 4.0 ft above existing runoff

¹ Buffers are unmowed, naturalized strips of vegetation around the wetland perimeter. Buffers would be provided during development or redevelopment

² Where possible, use 300-foot buffers as per MnRAM (Question #23).

³ If currently landlocked, new outlet should be above delineated wetland elevation.

1.1.1 Preserve

Wetlands classified as **Preserve** 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 rated as exceptional for wildlife habitat. These include wetlands known to harbor endangered or threatened animal species, rare communities, or wildlife refuges and fish and wildlife management areas whose purpose is maintaining suitable habitats for wildlife.
- Wetlands rated as high for amphibian habitat.
- Wetlands rated as exceptional for fish habitat. These wetlands include those specifically managed for fish management; designated trout streams, lakes or adjacent wetlands; and known spawning habitat for game fish.
- Wetlands rated high for shoreline protection. Wide wetlands bordering lakes and feeder streams that have persistent, emergent, submergent, or floating-leaved vegetation are critical to protecting the water quality of the lakes from bank erosion and sedimentation from upstream.
- Wetlands rated exceptional for aesthetics/education/recreation/cultural and rated high for wildlife habitat, include those located on public lands that provide a unique or rare recreational, educational, or cultural opportunity, and have high functional level for wildlife since that is typically a primary focus for users.
- Wetlands that are exceptionally sensitive to stormwater impacts and have a vegetative diversity/integrity rating of medium or higher were also placed in this category. These wetlands may have suffered some degradation from human influences due to their heightened sensitivity. The vegetative quality of the wetland is such that improved management may allow for restoration of the community.
- Wetlands with a high vegetative diversity/integrity rating *and* a high rating for wetland water quality. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning to maintain water quality, which is critical to wetland sustainability.
- Wetlands with a high vegetative diversity/integrity rating *and* a high rating for hydrologic regime. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability.

1.1.2 Manage 1

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

- Wetlands rated with high vegetative diversity/integrity, which typically include diverse wetland plant communities with less than 20 percent cover of non-native or invasive species.

- Wetlands rated as high for wildlife habitat. These generally include wetlands located within large tracts of undeveloped land or in parks, which allow for wide high quality upland buffers. In addition, this includes seasonal wetlands that are well buffered.
- Wetlands rated as medium for amphibian habitat. This includes seasonal wetlands that are well buffered.
- Wetlands rated as high for fish habitat. These wetlands are lacustrine/riverine or are contiguous with a permanent waterbody or watercourse and provide spawning/nursery habitat, or refuge for native fish species in adjacent lakes, rivers or streams.
- Wetlands rated medium for shoreline protection. These wetlands include those that are moderately wide and support persistent emergent, submergent, or floating-leaved vegetative cover bordering lakes and feeder streams.
- Wetlands rated high for aesthetics/education/recreation/cultural *and* medium for wildlife habitat, include those that provide a number of benefits that may include: spatial buffering, accessibility, public ownership, multiple recreational opportunities, and medium-quality wildlife habitat.
- Wetlands that are highly sensitive to stormwater impacts *and* have a vegetative diversity/integrity rating of medium or high were also placed in this category. The vegetative quality of the wetland is such that improved management may allow for restoration of the community.
- Wetlands with a medium vegetative diversity/integrity rating *and* a high rating for wetland water quality. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for water quality, which is critical to wetland sustainability. These wetlands would likely benefit from active management.
- Wetlands with a medium vegetative diversity/integrity rating *and* a high rating for hydrologic regime were placed in the **Manage 1** category. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability. These wetlands would likely benefit from active management.
- Wetlands rated high for commercial use. These wetlands provide important social value without having an altered hydrology.

1.1.3 Manage 2

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

- Wetlands rated with medium vegetative diversity/integrity, which typically include wetlands with less diversity and up to 50 percent cover of non-native or invasive species.
- Wetlands rated as medium for wildlife habitat. These often include wetlands that are increasingly separated from natural communities and wildlife corridors; they often lack significant upland buffers and are increasingly altered.
- Wetlands rated as low for amphibian habitat. These wetlands are increasingly altered, but they still have some opportunity to provide either breeding, over wintering, or resting habitat for amphibians.
- Wetlands rated as medium for fish habitat. These wetlands include those which are intermittently connected to waterbodies supporting native fish populations

- Wetlands rated low for shoreline protection. While these wetlands are not providing the highest level of protection to the lake or river systems, their mere presence provides some level of protection that should not be dismissed. These wetlands are typically narrow, with little emergent, submergent, or floating-leaved vegetation.
- Wetlands rated Medium for aesthetics/education/recreation/cultural and Low for wildlife habitat.

1.1.4 Manage 3

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

1.2 Wetland Restoration Potential

Evaluate restoration potential of drained and partially drained wetlands in the field. The potential for wetland restoration is determined based on the ease with which the wetland could be restored considering factors including: the number of landowners within the historic wetland area, the size of the potential restoration area, the potential for establishing buffer areas or water quality ponding, the extent and type of hydrologic alteration, and the potential for flooding adjacent properties. Using those parameters, a functional rating of High, Medium, or Low is computed where High means that there will be fewer obstacles to completing a successful restoration.

1.3 Wetland Susceptibility to Stormwater Input

Stormwater runoff carries soil particles, nutrients, and contaminants that can change the ecological balance of the receiving water body. Changes in the volume, rate, frequency, or duration of stormwater entering or discharging from the water body can also change the ecological integrity. Alterations to the ecological integrity of a wetland often result in changes in the functional capacity, fish and wildlife habitat, replacement of native vegetation with invasive and disturbance-tolerant plant species, and/or other impacts to the wetland's functions and values.

A methodology⁶ for determining the susceptibility of wetlands to degradation by stormwater input relates wetland type to a susceptibility level as shown in Table 1.2. Wetlands such as bogs and fens can easily be degraded by changes in the stormwater inflows and are designated as exceptionally susceptible. On the other hand, floodplain forests are more tolerant of changes in the frequency, magnitude and duration of flooding without degradation and are therefore classified as moderately susceptible. Shallow marshes and wet meadows dominated by hybrid cattail, reed canary grass, or other invasive/non-native species (see Table 1.2 and MNRAM 3.0) have a moderate susceptibility to stormwater fluctuations and inputs.

⁶ *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, 1997).

1.4 Wetland Management Standards

Wetland management standards are proposed to maintain tolerable hydrologic and water quality changes in wetlands based on the goals stated for the management classifications. The recommended wetland management system (Table 1.1) presents a framework for management of storm water in and around wetlands as well as considering the regulation of impacts to wetlands and wetland mitigation; it is not meant to be used for specific wetland area designs. Replacement plans must also consider other laws that may apply, including local regulations, state Wetland Conservation Act rules, and U.S. Army Corps of Engineers 404 or other permit requirements. Additional investigations or evaluations, including detailed hydrologic modeling and modeling of nutrient loadings and removals, will need to be performed to determine final pipe sizes, pipe configuration, pipe elevations, pipe location, and site grading.

1.4.1 Wetland Hydrology Standards

Wetland hydrology management standards were developed⁷ to protect wetlands from hydrologic impacts. These standards present tolerable hydrologic changes in terms of bounce (difference between the peak flood elevation and the normal wetland elevation), inundation period (time that flood waters temporarily stored in the wetland exceed the normal wetland elevation), and runout control (elevation of the outlet). It is assumed that wetland impacts will be minimized and existing wetland functions and values will be maintained if these standards are implemented.

⁷ Standards shown in Table 1.1.

Table 1.2
Susceptibility of Wetlands to Degradation by Stormwater Impacts⁸
Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.0

Exceptionally Susceptible Wetland Types:¹	Highly Susceptible Wetland Types:²	Moderately 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
Calcareous Fens	Shallow Marshes ^{d, c}	Deep Marshes ^c	
Low Prairies	Deep Marshes ^{d, c}		
Lowland Hardwood Swamps			
Seasonally Flooded Wetlands			

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 that 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 storm water may not have adverse impacts.

Notes: There will always be exceptions to the general categories listed above. Use best professional judgment. A more complete description of wetland characteristics under each category is contained in Appendix A of the source (see footnote). Pristine wetlands are those that show little disturbance from human activity.

⁸ **Adapted from:** *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.

1.4.2 Wetland Buffer Standards

Wetland buffer standards were developed with the focus on the buffer widths necessary for protecting water quality and for providing wildlife habitat. Suggested wetland buffer standards in Table 1.1 were developed based on a review of the scientific literature. The literature shows that the effectiveness of wetland buffers in removing sediments and nutrients from surface runoff varies widely due to many factors which include but are not limited to: slope, vegetative cover density, vegetation types, and width. Typically, buffers are established for their water quality improvement potential. High quality wildlife habitat requires significantly wider buffers and higher vegetative diversity/integrity.

Results from numerous studies on the effectiveness of buffers for improving water quality were compiled in a report prepared for the Minnehaha Creek Watershed District⁹. This data suggests that buffer widths of 50 feet generally will provide adequate protection from suspended solids for maintaining high water quality.

The data for phosphorus removal shows a slightly stronger, although not statistically significant, trend. Buffers wider than 60 feet showed considerably greater total phosphorus reductions than narrower buffers (69 percent of those buffers reduced total phosphorus by more than 70 percent).

Another major function of wetland buffers is providing wildlife habitat. Recommendations in the literature for wetland buffer maintenance for optimal wildlife functions range from an absolute minimum of 50 feet up to 600 feet. In general, wider buffers are suggested as providing greater wildlife benefits. Reasonable wildlife benefits can be realized with the retention of 100-foot wide buffers. Several communities in the Twin Cities Metropolitan area have enacted wetland buffer ordinances with required buffer widths up to 100 feet.

1.4.3 Wetland Sequencing and Mitigation Standards

The wetland sequencing and mitigation standards presented are suggestions based on interagency discussions and experiences with Comprehensive Wetland Management Plans. The goal of the recommended standards is to provide incentives to protect high quality wetland resources while realizing that low quality wetlands would not receive as stringent protection.

There are specific standards that must be met according to state and federal rules (WCA, 404, etc.). They can be varied by local plan and these management standards could serve as a basis, but not a substitute, for a local plan. Some management prescriptions suggested here could be implemented without a formalized local plan but all local, state, and federal rules would still apply. The COE could use these standards to vary replacement ratios on a case-by-case basis.

1.4.4 Stormwater Treatment Standards

Stormwater treatment management standards were developed to protect wetlands from water quality impacts. Various levels of pre-treatment of conveyed stormwater are recommended based on wetland management classification.

⁹ EOR, 2001

1.5 Best Management Practices

A table of common best management practices (BMPs) is provided in the Comprehensive Guidance. It includes a description of the benefits of each, pollutants controlled, and some general construction requirements. A comprehensive selection and design manual¹⁰ for BMP usage in cold climates covers a total of 40 BMPs including:

- Definition and description of the BMP
- Discussion of the BMP's means of operation
- Diagrams and information to guide design and installation
- Listing of inspection and maintenance considerations
- References for more detailed information

A comprehensive guide¹¹ to BMPs for protection and improvement of water quality in Minnesota includes the major principles and notable points relating to BMP practices. This is not a design manual. The BMP approaches are split into several categories including:

- BMPs for Storm Water Systems
- Detention Ponds
- Erosion Protection and Sediment Control
- Pollution Prevention

In addition, the manual includes a section summarizing the attributes of various hydrologic models. Best management practices should be implemented to the extent feasible in all construction projects to maintain and prevent degradation of wetland functions and values.

¹⁰ *The Minnesota Urban Small Sites BMP Manual – Stormwater Best Management Practices for Cold Climates*, Metropolitan Council and Barr Engineering Co., 2001.

¹¹ *Protecting Water Quality in urban Areas – Best Management Practices for Dealing with Storm Water Runoff from Urban, Suburban, and Developing Areas of Minnesota*, Minnesota Pollution Control Agency, 2000.

2.0 Critical Wetland Resources

Wetlands in the assessment area should be evaluated for designation as critical resources based on several features defined in Minnesota Statutes. These critical wetland resources should be classified into the Preserve management class due to their special functions. Criteria for designating wetlands as critical resources are as follows:

- Outstanding Resource Value Waters (Minn. Rules 7050.0180)
- Designated Scientific and Natural Areas (Minn. Rules 86A.05)
- Wetlands with known occurrences of Threatened or Endangered Species (Minn. Stat. 84.0895)
- State Wildlife Management Areas (Minn. Stat. 86A.05, subpart 8)
- State Aquatic Management Areas (Minn. Stat. 86A.05, subpart 14).
- Wellhead Protection Areas (Minn. Stat. 103I.101, MN Rules Chapter 4720).
- Sensitive Ground Water Areas (MN Rules 8420.0548, Subp. 6).
- Designated trout streams or trout lakes (MN Rules 6264.0050).
- Calcareous fens (MN Rules 8420.1010 through 8420.1060).
- High priority areas for wetland preservation, enhancement, restoration and establishment (MN Rules 8420.0350, subpart 2).
- Designated Historic or Archaeological Sites
- State or federal designated wild and scenic rivers (MN Rule Chapter 7050)

2.1 Outstanding Resource Value Waters

"Outstanding resource value waters" are defined in MN Rules 7050.0180 as waters within the Boundary Waters Canoe Area Wilderness; Voyageur's National Park; and Department of Natural Resources designated scientific and natural areas; wild, scenic, and recreational river segments; Lake Superior; those portions of the Mississippi River from Lake Itasca to the southerly boundary of Morrison County that are included in the Mississippi Headwaters Board comprehensive plan dated February 12, 1981; and other waters of the state with high water quality, wilderness characteristics, unique scientific or ecological significance, exceptional recreational value, or other special qualities which warrant stringent protection from pollution.

2.1.1 Calcareous Fens

Calcareous fens are defined in MN Rules 8420.1020 as peat-accumulating wetlands dominated by distinct groundwater inflows having specific chemical characteristics. The water is characterized as circumneutral to alkaline, with high concentrations of calcium and low dissolved oxygen content. The chemistry provides an environment for specific and often rare hydrophytic plants¹². Minnesota Rules 8420.1010-1070 sets out minimum standards and criteria for the identification, protection, and management of calcareous fens as authorized by Minnesota Statutes, section 103G.223. The MnDNR is charged with identifying and maintaining a list of calcareous fens in the state and maintains a database of them. Calcareous fens are also listed in the Classifications for Waters in

¹² MN Rules 8420.1020

Major Surface Water Drainage Basins¹³. Finally, the rules for Nondegradation of Outstanding Resource Value Waters¹⁴ also lists identified calcareous fens in the state.

2.1.2 Scientific and Natural Areas

State scientific and natural areas (SNA) are established to protect and perpetuate, in an undisturbed natural state, those natural features which possess exceptional scientific or educational value (MN Statutes 86A.05). This may include but is not limited to any of the following features: geological processes; significant fossil evidence, an undisturbed plant community, an ecological community significantly illustrating the process of succession and restoration to natural condition following disruptive change; a habitat supporting a vanishing, rare, endangered, or restricted species of plant or animal; a relict flora or fauna persisting from an earlier period; or a seasonal haven for concentrations of birds and animals, or a vantage point for observing concentrated populations, such as a constricted migration route. The area should embrace an area large enough to permit effective research or educational functions and to preserve the inherent natural values of the area.

2.1.3 Habitat for Designated Endangered, Threatened, or Special Concern Species

Endangered and threatened plant and animal species are protected in Minnesota as specified in MN Statutes 84.0895. In MN Statutes, Subp. 3, species of wild animal or plant are designated as:

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

In 1987, the Minnesota County Biological Survey (MCBS) began a systematic survey of rare biological features. The goal of the MCBS is to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants, rare animals, and native plant communities. The MCBS data for the assessment area (if available) should be examined for sites with medium, high and outstanding biologic diversity significance.

The MnDNR Natural Heritage and Nongame Research Program (Natural Heritage Program) collects, manages, and interprets information about nongame animals, native plants, and plant communities to promote the wise stewardship of these resources. The Natural Heritage Program has developed a ranking system that is intended to reflect the extent and condition of natural communities and species in Minnesota.¹⁵ These 'state ranks' have no legal ramifications, they are used by the Natural Heritage Program to set priorities for research and for conservation planning. They are grouped as follows:

¹³ MN Rules 7050.0470

¹⁴ MN Rules 7050.0180, Subp. 6

¹⁵ Aaseng, N.E., J.C. Almendinger, R.P. Dana, B.C. Delaney, H.L. Dunevitz, K.A. Rusterholz, N.P. Sather, and D.S. Wovcha. 1993. Minnesota's Native Vegetation: A Key to Natural Communities, Version 1.5. Minnesota Department of Natural Resources Biological Report No. 20. Natural Heritage Program.

State Element Rank:

S1: Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state.

S2: Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3: Rare or uncommon in state (on the order of 21 to 100 occurrences).

S4: Apparently secure in state with many occurrences.

S5: Demonstrably secure in state and essentially ineradicable under present conditions.

SH: Of historical occurrence in the state, perhaps having not been verified in the past 20 years, and suspected to be still extant.

SN: Regularly occurring, usually migratory and typically nonbreeding species for which no significant or effective habitat conservation measures can be taken in the state.

SR: Reported from the state, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.

SRF: Reported falsely.

SU: Undetermined. Possibly in peril in the state but status uncertain; need more information.

SX: Extirpated within the state.

The Natural Heritage Program information database should be searched to determine if any endangered, threatened, or special concern species have been sighted within 500 feet of the assessment area. The list of species, the subwatershed location, legal protection status, state element rank and county should be compiled.

2.1.4 State Wildlife Management Areas

State wildlife management areas are established to protect those lands and waters which have a high potential for wildlife production and to develop and manage these lands and waters for the production of wildlife, for public hunting, fishing, and trapping, and for other compatible outdoor recreational uses¹⁶. State wildlife management areas satisfy the following criteria:

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

¹⁶ MN Statute 86A.05, subpart 8. A map of all MnDNR Wildlife Management Areas can be found at: www.dnr.state.mn.us/maps/compass.html.

2.1.5 Designated Trout Streams and Lakes

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

A list of all state trout streams and lakes can be found at: www.revisor.leg.state.mn.us/arule/6264/.

2.1.6 Aquatic Management Areas

Minnesota Statutes 86A.05, Subpart 14, allows for the establishment of aquatic management areas to protect, develop, and manage lakes, rivers, streams, and adjacent wetlands and lands that are critical for fish and other aquatic life, for water quality, and for their intrinsic biological value, public fishing, or other compatible outdoor recreational uses. Aquatic management areas may be established to protect wetland areas under ten acres that are donated to the department of natural resources. Aquatic management areas must meet one or more of the following criteria:

1. Provides angler or management access;
2. Protects fish spawning, rearing, or other unique habitat;
3. Protects aquatic wildlife feeding and nesting areas;
4. Protects critical shoreline habitat; or
5. Provides a site for research on natural history.

2.1.7 Wellhead Protection Areas

Wellhead protection is defined as a method of preventing well contamination by effectively managing potential contaminant sources in all or a portion of the well's recharge area. The statutory authority for wellhead protection comes from Minnesota Statutes 103I.101. The rules for establishment of Wellhead Protection Plans are found in Minnesota Rules Chapter 4720, which are administered by the Minnesota Department of Health. Wetlands present within wellhead protection areas are likely to be predominantly recharge wetlands. Since wetlands typically collect surface water runoff from a larger upland area, recharge wetlands within wellhead protection areas have a greater probability of transmitting pollutants to a public groundwater supply than other wetlands. Wellhead protection plans are developed and implemented by the public water supplier, which is typically a city or the Minnesota Department of Health.

2.1.8 Sensitive Groundwater Areas

The Wetland Conservation Act requires that projects proposing to impact wetlands must evaluate whether the impacts would have an adverse impact on groundwater quality¹⁷. If it is determined that a proposed replacement plan would have a significant adverse impact on groundwater quality, the replacement plan must be denied. Wetlands determined to be primarily recharge wetlands as a result

¹⁷ Minnesota Rules 8420.0548, Subpart 6. The state rules governing wellhead protection can be accessed on the web at: www.revisor.leg.state.mn.us/arule/4720/.

of a functional assessment using *MNRAM Version 3.0* should be evaluated for the potential to affect groundwater resources¹⁸.

2.1.9 High-Priority Areas for Wetland Preservation, Enhancement, & Restoration

Water management plans prepared by water management organizations in the metropolitan areas under Minnesota Statutes, section 103B.231 must identify those areas that qualify as high priority areas for wetland preservation, enhancement, restoration, and establishment¹⁹. These priority areas shall be included in the next scheduled water management plan update. Plans should give strong consideration to identifying as high priority areas, minor watersheds having less than 50 percent of their original wetland acreages, and intact wetlands, diminished wetlands, and the areas once occupied by wetlands that have been diminished or eliminated and could feasibly be restored taking into account the present hydrology and use of the area. Plans should give strong consideration to identifying as high priority areas all type 1 or 2 wetlands, and other wetlands at risk of being lost by permanent conversion to other uses. When individual wetlands are identified as high priority for preservation and restoration, the high priority area shall include the wetland and an adjacent buffer strip not less than 16.5 feet wide around the perimeter of the wetland and may include up to four acres of upland for each wetland acre.

Plans may identify additional high priority areas where preservation, enhancement, restoration, and establishment of wetlands would have high public value by providing benefits for water quality, flood water retention, public recreation, commercial use, and other public uses. High priority areas should be delineated by minor or major watershed.

2.1.10 State and Federal Designated Scenic and Wild Rivers

The rules for the protection of state designated scenic and wild rivers is set forth in Minnesota Rules Chapter 6105 as administered by the MnDNR²⁰. Wild rivers are defined as those that exist in a free-flowing state with excellent water quality and with adjacent lands that are essentially primitive and scenic rivers are defined as those that exist in a free-flowing state with adjacent lands that are essentially primitive. Management plans must be developed before a river can be included in the wild and scenic river system. The plans must give emphasis to the preservation and protection of the area's scenic, recreational, natural, historic, and similar values while placing no unreasonable restrictions upon compatible, preexisting, economic uses of particular tracts of land.

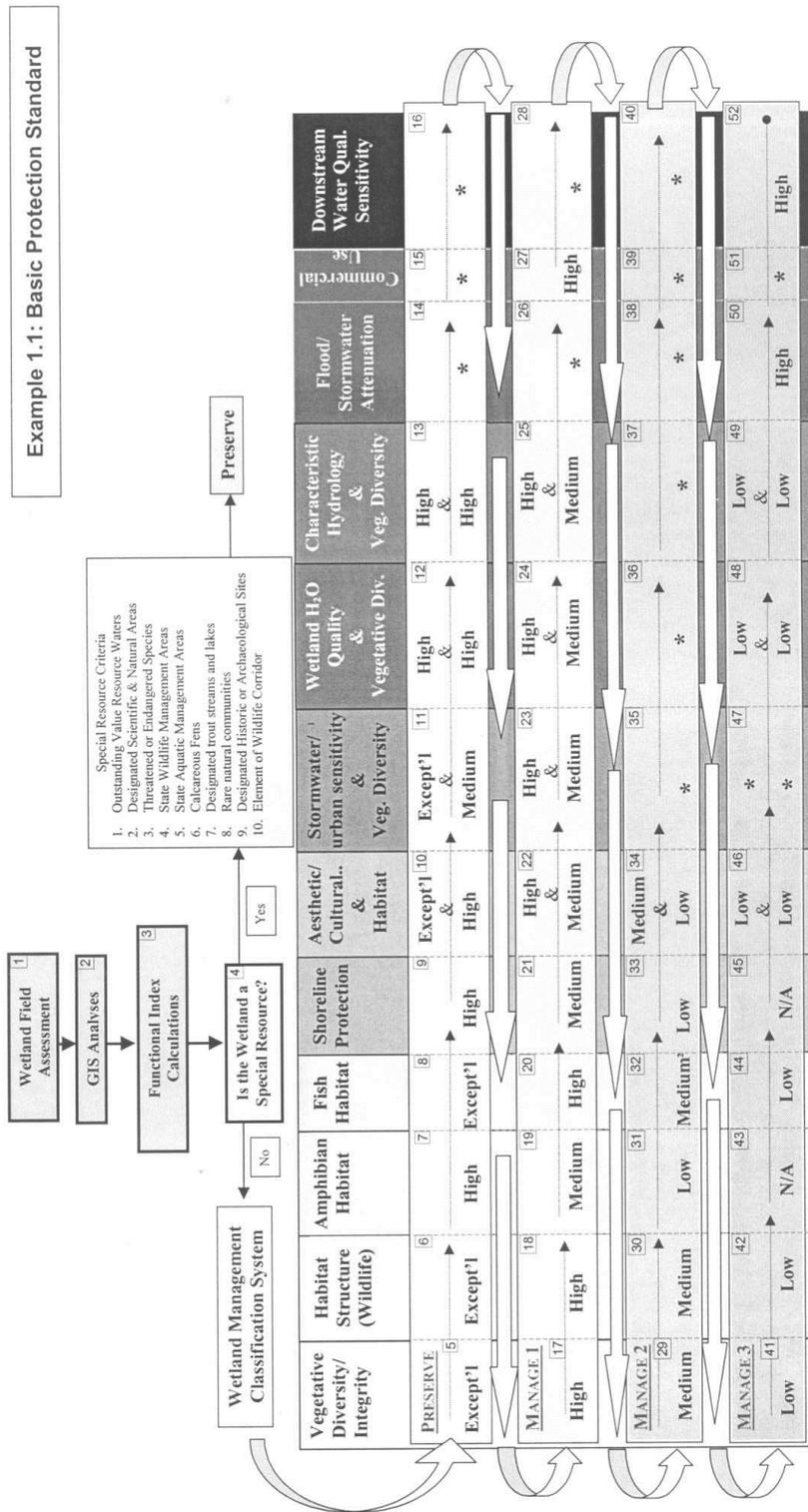
¹⁸ Evaluate according to the guidelines in: *Criteria and Guidelines for Assessing Geologic Sensitivity of Ground Water Resources in Minnesota* (MnDNR, 1991).

¹⁹ Minnesota Rules 8420.0350, Subp. 2

²⁰ The state rules can be accessed at: www.revisor.leg.state.mn.us/arule/6105/.

Figure 1.1
Wetland Management Classification Process Flowchart for Basic Wetland Protection

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



¹ For types as shown in Table 1.2.

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* This rating does not apply here.

