

Lino Lakes Special Area Management Plan (SAMP)

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Prepared For:
Rice Creek Watershed District
and the City of Lino Lakes

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PREAMBLE

Intent

The City of Lino Lakes (City) and the Rice Creek Watershed District (RCWD) have prepared a Special Area Management Plan (SAMP) for the subwatersheds within the City. The Army Corps of Engineers St. Paul District (Corps) intends to use the SAMP in its Clean Water Act (CWA) Section 404 permit evaluations within the area addressed by the SAMP.

Background

In September 2008, the Minnesota Board of Water and Soil Resources (BWSR) approved the Lino Lakes Resource Management Plan (LL RMP) as a Comprehensive Wetland Management Plan following the requirements of the Minnesota Wetland Conservation Act (WCA). The RCWD, in coordination with the City, adopted Rule RMP-3 that implements the LL RMP. In February 2010, the Corps issued a Public Notice inviting comment on the proposal to use the planning level alternatives analysis incorporated into the LL RMP in CWA Section 404 permit evaluations; no comments were received in response to that public notice.

The LL RMP provides a watershed-based approach to wetland management that is consistent with RCWD goals, the WCA and CWA Section 404 and is currently being used in permit evaluations within the City. Following the adoption of Rule RMP-3, RCWD and the City embarked on the effort to develop the LL RMP into a Special Area Management Plan (SAMP) that could be used to expedite Corps permit evaluations within the City. Projects consistent with the SAMP may potentially be eligible for issuance of an expedited Department of the Army permit developed specifically for the SAMP area (see Appendix C).

The SAMP includes analyses conducted by the RCWD, which address wetland prioritization, watershed hydrologic modeling and water quality modeling. These detailed analyses have been used by the City in the development of its 2030 Comprehensive Plan Update, which has been approved by the Metropolitan Council. The Metropolitan Council is a regional planning agency created by Minnesota Statute with the power to approve local comprehensive plans.

The purpose of the SAMP is to provide a watershed-based and conservation-based framework for aquatic resource management, particularly as development and redevelopment occur within the City. The SAMP addresses future water quality, quantity, flow rates and wetland function and condition in light of forecasted development and potential changes to surface and groundwater characteristics. The RMP and SAMP have been developed consistent with Environmental Protection Agency (EPA) Total Maximum Daily Loads (TMDL) goals of the multiple impaired waterbodies within and downstream of the City. At the time of SAMP adoption, the Peltier-Centerville nutrient TMDL and Lino Chain of Lakes nutrient TMDL were under EPA preliminary review. Implementation Plans for both TMDLs were expected to be approved by the Minnesota Pollution Control Agency in the fall of 2010.

Implementation Process

The State of Minnesota conducts wetland permitting differently than many other states. Minnesota has a local regulatory program enforced through Statute and Rule to protect aquatic resources. Most notably is Minnesota Rule 8420 that has a clearly stated purpose to:

- A. achieve no net loss in the quantity, quality, and biological diversity of Minnesota's existing wetlands;
- B. increase the quantity, quality, and biological diversity of Minnesota's wetlands by restoring or enhancing diminished or drained wetlands;
- C. avoid direct or indirect impacts from activities that destroy or diminish the quantity, quality, and biological diversity of wetlands; and
- D. replace wetland values where avoidance of activity is not feasible and prudent.

The purpose to protect and conserve aquatic resources is carried out through local governing units (LGU) with oversight by BWSR. A framework for local decision-making has been established that requires representation in a Technical Evaluation Panel (including members of the local soil and water district, BWSR and often the state Department of Natural Resources) to be involved in the wetland permitting process. Although not officially part of the local TEP, project managers from the St. Paul Corps are regular attendees in meetings to discuss wetland permit actions.

The Rice Creek Watershed District is the Wetland Conservation Act LGU for all areas of Lino Lakes included in this SAMP. The process for developing this SAMP included active participation by the City and the Corps. The Corps, through coordination with the Environmental Protection Agency, has provided input and comments on the SAMP in support of its watershed-based approach to aquatic resource management and to maintain consistency with the CWA Section 404 regulatory framework. To be compliant with the CWA, individual development proposals must avoid and minimize wetland impacts to the extent practicable.

If an applicant demonstrates that there are no practicable alternatives to a proposed action within the SAMP study area that would avoid wetland impacts, the components of the SAMP will be incorporated into CWA Section 404 permit evaluations within the SAMP study area using a SAMP General Permit. As long as the proposed action meets the program requirements of the SAMP, it may be eligible for the SAMP Programmatic General Permit PGP (Appendix C).

In addition to the state and federal regulatory bodies, the City of Lino Lakes also plays a key role in the implementation of this SAMP. The LL RMP and the TMDL processes were fully integrated with the local Comprehensive Plan update. The City will be implementing its Comprehensive Plan by establishing ordinances to complement the RCWD Rule RMP-3 including protections for high priority wetlands. This SAMP is based upon the LLRMP, and Rule RMP-3 is the basis for the implementation of this SAMP. LLRMP, implemented through Rule RMP-3 is the supporting framework for the SAMP and PGP.

THE SPECIAL AREA MANAGEMENT PLAN PROCESS

Needs Analysis

In all regions of the country, Special Area Management Plans (SAMPs) are initiated to anticipate and resolve ahead of time the demand for Section 404 permits in rapidly developing areas with sensitive aquatic resources. The problem-solving in each SAMP area varies with the unique physical and biological differences. The need has to be brought on by multiple interest groups, not just the desire of the Corps to address permitting. The interest groups vary widely and include counties, cities, regional planning groups and citizens.

Goals

By examining some of the more recent SAMPs the trend is clearly towards a watershed approach to preserving or restoring ecological functions of wetlands and associated aquatic resources. The goal for a SAMP often includes a desire for certainty in the permitting process and hence having one of the outcomes be a programmatic permit of some sort. However, this goal is not a required outcome.

The development of this SAMP followed detailed guidance in Regulatory Guidance Letter (RGL) No. 05-09 issued December 7, 2005. RGL 05-09 defines a SAMP as “a comprehensive plan providing for natural resource protection and reasonable...economic growth containing a detailed and comprehensive statement of policies, standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas...”. Primary considerations for developing a SAMP include;

- considerations for a cumulative review of impacts rather than case-by-case,
- local interest to protect environmentally sensitive resources under development pressure and
- defined permitting outcomes for a general permit or abbreviated process.

Examples

The needs and goals of several SAMPs from different regions of the country are briefly summarized here as examples of the situations in which the various stakeholders believed that a SAMP was the appropriate direction to take for addressing wetland and aquatic resource management and permitting.

Superior SAMP I (1996) and II (2003), WI

SAMP I was implemented from 1996-2007 to provide urban area development and mitigation credit. The SAMP II is to address urban areas dominated by wetlands. The SAMP I generated a wetland credit deficit and moving into SAMP II required a decision by the local government board to find and authorize credits for the SAMP I area. This was accomplished by placing an existing upland-wetland habitat complex into permanent protective covenant. The SAMP II was written so as not to allow a deficit in credit. This means that immediate attention needed to be paid to developing potential credit sites; it also allowed for non-SAMP project use of credits. There is no de minimus; mitigation in SAMP I ranged from creation to vegetation control and upland buffer preservation to habitat complex preservation.

Sunrise River Watershed Based Mitigation Pilot Study, MN

As of the date of print of this SAMP, this project is currently underway in a rapidly developing area in a watershed adjacent to Rice Creek, northeast of St. Paul, Minnesota. This effort is being led by the St. Paul Corps and focuses on wetland mitigation planning with other watershed objectives such as improving natural and water resources and meeting TMDL goals.

Otay River Watershed, San Diego County, CA (2008)

This SAMP focused on implementing the Multiple Species Conservation Program as a preserve rather than unorganized open space easements. It is intended to address streamlining permits, better permit coordination, coordinated impacts and mitigation to assemble wetland conservation areas, goals of the municipal stormwater permit, severity of impact not just acres of impact, landscape and watershed effects and cumulative impacts, and desire by the regulated community to include predictability. Permits would be limited from being processed in areas with high aquatic ecosystem integrity. Mitigation is to address ecological needs at a watershed level. It complements a recent watershed management plan but provides for a regulatory component.

Tooele Valley Wetlands SAMP, Utah (2006)

The SAMP will delineate wetlands for mapping purposes (a statistical sample set for ground-truth) and evaluate wetland functions to clarify to landowners where they are located. A 4-meter square satellite imagery was used for mapping. A general permit will be required for an applicant who does not want to conform to SAMP land use. The SAMP can be re-evaluated on a 5-yr or more frequent basis. A goal is to obtain an area-wide general permit. Non-buildable land as per the SAMP can be compensated. Owners of nonbuildable land can be compensated depending on how much they are willing to enhance the land.

Metro Bay SAMP, Rhode Island (formerly Providence Harbor SAMP, 1983)

Implementation of this SAMP uses a special area policy set by the Rhode Island Coastal Resources Management Council, including rules governing buffers (urban and nonurban standards), 100% on-site vegetative stormwater treatment, preservation and restoration of habitat corridors, four zoning variations, and capturing pollutants from surface runoff. An online SAMP mapper is provided as a service to assist land owners on zoning, resources, etc.

Western Riverside SAMP, CA (2007)

In this SAMP, benefits are the equivalent of a nationwide Corps permit that provide more certainty in the permitting process, especially for major public infrastructure projects. Watershed scale analysis of wetlands and waters of the U.S. is included in preparation of the SAMP. Most public and private projects would not need to obtain individual Corps permits. State water quality and streambed alteration permits would be covered under the permit and programmatic regional general permits and LOP would be used for impacts to Corps jurisdictional areas.

NEEDS AND GOALS OF THE LINO LAKES SAMP

Programmatic Permit

The Lino Lakes (LL) SAMP was developed with the intent to result in a programmatic permit for the area under consideration. Two forms were considered, the regional general permit and letter of permission (LOP) procedure.

Coordinated Wetland Permitting

The programmatic permit requires coordination with federal and state fish and wildlife agencies, the MnDNR, EPA, and MPCA. This was accomplished through noticing of the Project Alternatives Analysis (PAA) and noticing of the SAMP.



Throughout this document, a spotlight will be placed on various sections of the Resource Management Plan (RMP) Rule-3 for a look at how the SAMP will be implemented at a local level through state wetland law permitting of individual projects that affect land, watersheds, and aquatic resources.



Figure 1. City of Lino Lakes Location Map

Integrated aquatic resource management of wetlands and stormwater management in conjunction with land use planning

The Lino Lakes RMP was approved by the State Board of Water and Soil Resources (BWSR) as a Comprehensive Wetland Management Plan September 24, 2008 for use by the Rice Creek Watershed District (RCWD) who has been delegated the local authority to administrate the State Wetland Conservation Act (WCA). The RCWD has adopted a Rule (Rule RMP-3) to implement the RMP through permit approval. The RMP was used by the City of Lino Lakes for its Comprehensive (Comp) Plan, a document required by the Metropolitan Council (MC), a regional planning agency with wastewater treatment and collection as a major responsibility. The MC guides communities in planning for future population projections, including wise management of water resources. The LL Comp Plan provides the link between the water management and land use planning. The RMP, as an underlying technical and policy document of the SAMP, has goals for integrating aquatic resource management at a watershed scale.

 Spotlight in the Rule: Purpose**RULE RMP-3 Implementing Lino Lakes Resource Management Plan
(Adopted January 28, 2008)**

This collaboration was initiated in 2006 and included extensive coordination between the City, the Watershed and other regulatory agencies. The LL RMP provides a watershed-based approach to wetland management that is consistent with RCWD goals. The approach uniquely addresses management in the context of wetland functions and the effects of anticipated future land use. The RMP was developed in close coordination with state and federal permitting authorities and has been prepared to be consistent with both state and federal wetland regulations. It is intended that components of the plan be incorporated into Clean Water Act Section 404 permit evaluations. The approach is unique as a means to develop a comprehensive wetland management plan according to the State of Minnesota Wetland Conservation Act because it not only includes the required assessment of existing wetland functions and values, but it also forecasts future functions in light of anticipated land use and watershed-based approaches for no net loss of wetland function.

This Rule implements the Lino Lakes RMP by providing maximum consistency with Minnesota Wetland Conservation Act (WCA) requirements for a Comprehensive Wetland Management Plan and no net loss in acreage and function of wetland resources. The Rule is also consistent with the Federal Clean Water Act requirements for Section 404. Because the RMP was coordinated with multiple Total Maximum Daily Load studies, it provides an implementation strategy for those efforts. The RMP provides a watershed-based context to the public Ditch Repair process proceeding on a parallel track. Through an iterative process the RMP also provides guidance to the City of Lino Lakes for ecological-based land use decisions during their Comprehensive Plan update and storm water management plan update process.

This framework of guiding where wetland impact and replacement may occur is intended to have the effect of reestablishing larger, contiguous areas of wetland and riparian edge. As the other side of the same coin, it would afford landowners more flexibility to create larger contiguous areas of upland for use and development than reasonably could be fashioned under standard parcel-based wetland permitting. This is one of several respects in which the RCWD believes that Rule RMP-3 will provide benefits to landowners as compared with standard wetland permitting, while providing for greater water resource protection.

1. **PURPOSE.** The purpose of this Rule is to implement the Lino Lakes Resource Management Plan (June, 2008) ("RMP") adopted by the Rice Creek Watershed District ("District") Board of Managers on October 8, 2008. The RMP constitutes a Comprehensive Wetland Management Plan under Minnesota Statutes §103G.2243 and was approved by the Minnesota Board of Water and Soil Resources (BWSR) on September 24, 2008. It examines natural resources on a watershed basis to create a planning and regulatory framework that will protect and enhance those resources in the context of development pressures within the watershed and the continuing maintenance of capacity within the public drainage systems in accordance with Minnesota Statutes Chapter 103E. This Rule regulates activity both in wetland and on upland within the RMP area. It comprehensively addresses wetland and other water resource protection concerns and therefore replaces permit review under individual District Rules C (Stormwater Management) and F (Wetland Alteration).

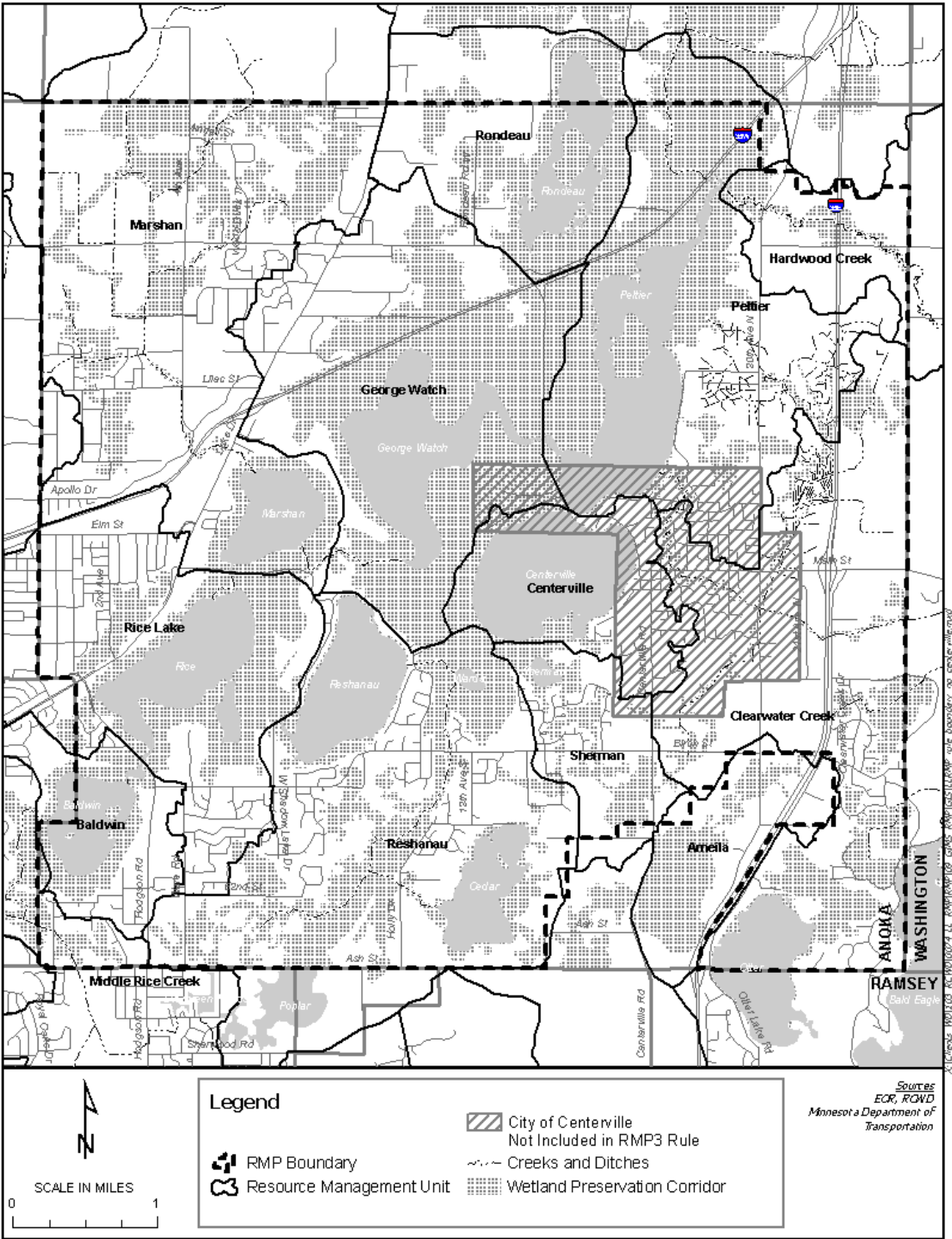


Figure 2. City of Lino Lakes RMP and SAMP Boundary

IDENTIFICATION OF HIGH PRIORITY RESOURCES

Inventory and Functional Assessment of Wetlands

This section of the document provides or references the wetland inventory, function and value assessment, and prioritization of resources.

Wetland Inventory

Wetlands and other land cover were mapped using the Minnesota Land Cover Classification System (MLCCS). Through a process that involved input from local and federal regulatory agencies, the MLCCS cover types were cross-referenced to the Cowardin Classification System and Eggers & Reed¹ in order for the data to be utilized for a wetland functional assessment and other regulatory purposes. MLCCS inventory is a complete land cover inventory, not just a 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 and wetland database was updated as part of this project to ensure the most recent and accurate data was available for analysis. The data base developed is very valuable for assessing future land use scenarios and the effect on wetlands.

Landscape Level Wetland Functional Assessment

The purpose of the wetland functional assessment was to accomplish the following:

- Identify high priority wetland resources on a watershed basis;
- Determine criteria for the SAMP that maintain wetland functions; and
- Identify potential wetland restoration sites.

Wetland functional assessments can be conducted at a variety of spatial scales. In very general terms, the broadest scale is a Level I. A local example of this level of assessment is the work being conducted by the MPCA called the Landscape Development Intensity. This assessment looks at wetland density across a wide spatial area. Level II is typically what is conducted for a development project evaluation. In Minnesota, the MN Routine Assessment Method (MnRAM) most current version is typically used for this assessment. Level III assessments are very detailed inventories like the MPCA Indices of Biotic Integrity.

Data Availability

Individual permit applicants, regulatory agencies and other interested parties have access to the wetland inventory and functional assessment data by contacting Rice Creek Watershed District.

¹ Eggers, Steve D., and Donald M. Reed. 1997. Wetland plants and communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St. Paul District

The following images depict the scale differences.



Level I Mapping and Assessment – takes a bird’s eye view; overall landscape patterns are available but not detail on particular wetland community types.



Level II – focuses in on a single wetland complex and direct boundary interactions; typical for MLCCS map detail; provides specific plant community types and ability to examine adjacent upland factors affecting the wetland.



Level III – examines interactions within the wetland; the wetland boundary is more precisely defined based upon direct field visit; details on specific plant and animal species; some MLCCS-mapped wetlands have detail at this level.

The SAMP functional assessment is on average a Level II assessment. Regulatory permitting requiring functional assessment typically relies on Level II assessment data. In a few areas Level III data are available, such as the GIS layer from the MnDNR on rare species and high quality natural communities and wetland delineation data from a few specific areas.

Herein after the assessment will be referred to as a landscape or watershed scale assessment.

High priority wetland resources were identified using the functional assessment results and field checking using knowledge of the local resources. The functional assessment methodology was developed by selecting wetland indicators and scoring protocols in coordination with the Technical Evaluation Panel (TEP). The TEP was made up of representatives from the local governing unit for the WCA, Rice Creek Watershed District; Anoka Conservation District; Board of Water and Soil Resources, US Army Corps of Engineers and City of Lino Lakes. Functional assessment scoring methodologies and assumptions were developed and discussed at several meetings with the TEP. The RMP appendix documents the TEP involvement in this process. Indicators were measured and then each function was calculated independently through a formula that combines the particular set of indicators of that function. The functional assessment results are expressed for each function according to High, Medium, or Low level of functional capacity. Functions cannot be combined into one, “supra-function” for a wetland, because several of them operate independently and inversely with each other. For example, based upon the formulas to calculate flood/stormwater attenuation function and maintenance of wetland water quality, the results will be inversely related to each other. The functions evaluated are listed in the table below.

Functions Assessed at the Landscape Level

- A. Maintenance of Characteristic Hydrologic Regime
- B. Flood/Stormwater/Attenuation
- C. Downstream Water Quality
- D. Maintenance of Wetland Water Quality
- E. Wetland Restoration Potential
- F. Vegetative Diversity/ Integrity

The Wetland Preservation Corridor and High Priority Wetlands

The Wetland Preservation Corridor (WPC), shown in Figure 2 encompasses high priority wetlands. Taking into consideration anticipated future land use, the high priority wetlands in the WPC have the potential to be adversely affected by both adjacent land use and watershed runoff characteristics. As such, proposed activities with the potential to affect high priority wetlands will be subject to more stringent standards in wetland permit decisions. Impacts to wetlands eligible for the final WPC, if permitted, will likely result in increased replacement ratios. On the other hand, wetland replacement and banking plans that enhance the functioning of the WPC will be given preference.

The WPC concept was developed to address multiple objectives:

- First, it encompasses those priority resources that, on a watershed basis, are the focus of additional protection and enhancement in order to ensure functions are preserved for the future.
- Second, it provides a basis for watershed-based decisions on avoiding, minimizing, and mitigating adverse impacts to wetlands.

- Third, because many of the existing wetlands within the landscape scale WPC are partially drained due to the public ditches, an expanded opportunity/mechanism for restoring wetland function is created.

The landscape level WPC designation is based upon assessment of wetland functions and other factors considered integral to protecting and enhancing high priority wetland resources. The final WPC wetlands will be established at the time that actions triggering the RMP Rule, as described herein, are initiated. Site-specific information such as a wetland delineation and functional assessment will be obtained and submitted by the applicant. The RCWD Board, based on TEP recommendations, will establish the final WPC in review of the proposed action. It will include a 50-foot upland buffer width and potential additional width for wetland plant communities with high vegetative integrity. Wooded upland habitat areas adjoining the WPC and critical for the functioning of wetlands will be given special consideration with incentives to conserve such areas.

The planning level WPC designation was established by integrating the following landscape-scale assessment of vegetative integrity, restoration potential, special features, and upland natural areas.

- High function vegetative integrity
- High function restoration potential
- Select special features as described by MnRAM 3.0, including flood zones
- Current ‘major and trunk drainageways’, including public ditch systems

The 50-foot upland buffer width will oftentimes be exceeded just by proper site planning in the transition zone from developed upland areas to the wetland edge, including

- volume features (biofiltration, infiltration, conservation areas);
- wetland replacement sites; and

open space, greenways, and passive parks and trails.

Regional natural area priorities such as the Anoka Conservation District ‘Hubs and Corridors Plan’ (a county greenway system map) were then compared for consistency.

People and organizations with a variety of interests own the WPC land. The actual boundary of the final WPC will be established based upon proposed actions on parcels that trigger permitting. That information will be used to determine each wetland’s status as either in the WPC or out of the WPC.

The geographic area to be specifically defined at the time of permitting as the final WPC shall be established according to the definition in the Rule.

Spotlight in the Rule: WPC Definition

Wetland Preservation Corridor (WPC)- Incorporation of high-priority wetland resources identified at a landscape scale in the RMP and delineated at the time of individual project permitting as:

- (i) Wetland community that is physically contiguous with (not separated by upland from) the landscape scale WPC alignment and/or that ranks high for vegetative integrity using MnRAM, (the most current version), or other state-approved methodology or
- (ii) Wetland community meeting the vegetative integrity criterion of paragraph (i) and any part of which is within 50 feet of the community identified under paragraph (i); with inclusions of habitat and stormwater management features consistent with the strategies identified for each Resource Management Unit.

The TEP will review the proposed WPC and make a recommendation to the RCWD Board for determining the extent of the final WPC.

The SAMP provides disincentive for adverse impacts to the WPC. Wetland type, level of degradation, and function are used to establish the replacement required of proposed impacts. Both direct and indirect impacts to WPC wetlands, if permitted, will likely result in a higher replacement ratio compared to non-WPC wetlands. This is because the landscape functional assessment used to establish the WPC is a good screening tool for anticipating the level of function from site-specific evaluation.

The SAMP also provides a framework for municipal open space planning. At a local land use planning level, the WPC should be protected and identified as open space, and wetland-compatible transition zone land uses should also be considered in early site planning review.

Findings from Inventory and Assessment of Aquatic Resources

The interacting watershed components and processes identified in Lino Lakes are as follows:

- Public Ditch Systems,
- Watershed Runoff,
- Nutrient Load,
- Wetlands and Associated Habitats, and
- High Priority Resources.

Public Ditch Systems

The public ditch systems are an integral part of the RMP, and the RMP serves as the ditch repair alternative for each system. Updated ditch maps and system data were developed based on field surveys and historic records (Figure 3). The 10-22-32 and 25 ditches are traditional open channels in urban or urbanizing areas. An evaluation of repair options will be conducted through a legal process including a ditch repair petition and report. The repair for these two public ditches will be coordinated with the LL RMP and City Comp plan. Ditch 47 was constructed as a public ditch and has since been officially abandoned. The ditch still functions as a stormwater conveyance system, but it is not managed by the Minnesota drainage statutes under 103E. Ditch 55 and 72 are tile systems that are functioning at capacity. Portions of these tile systems are proposed to be converted to open swales and greenways in the context of future urban land use. Profile and repair reports have been completed for all of these ditch systems, and the RMP recommendations integrate ditch repair implementation projects. The 10-22-32 system is particularly complex and recommendations for each branch is provided in the Future Conditions section of the RMP.

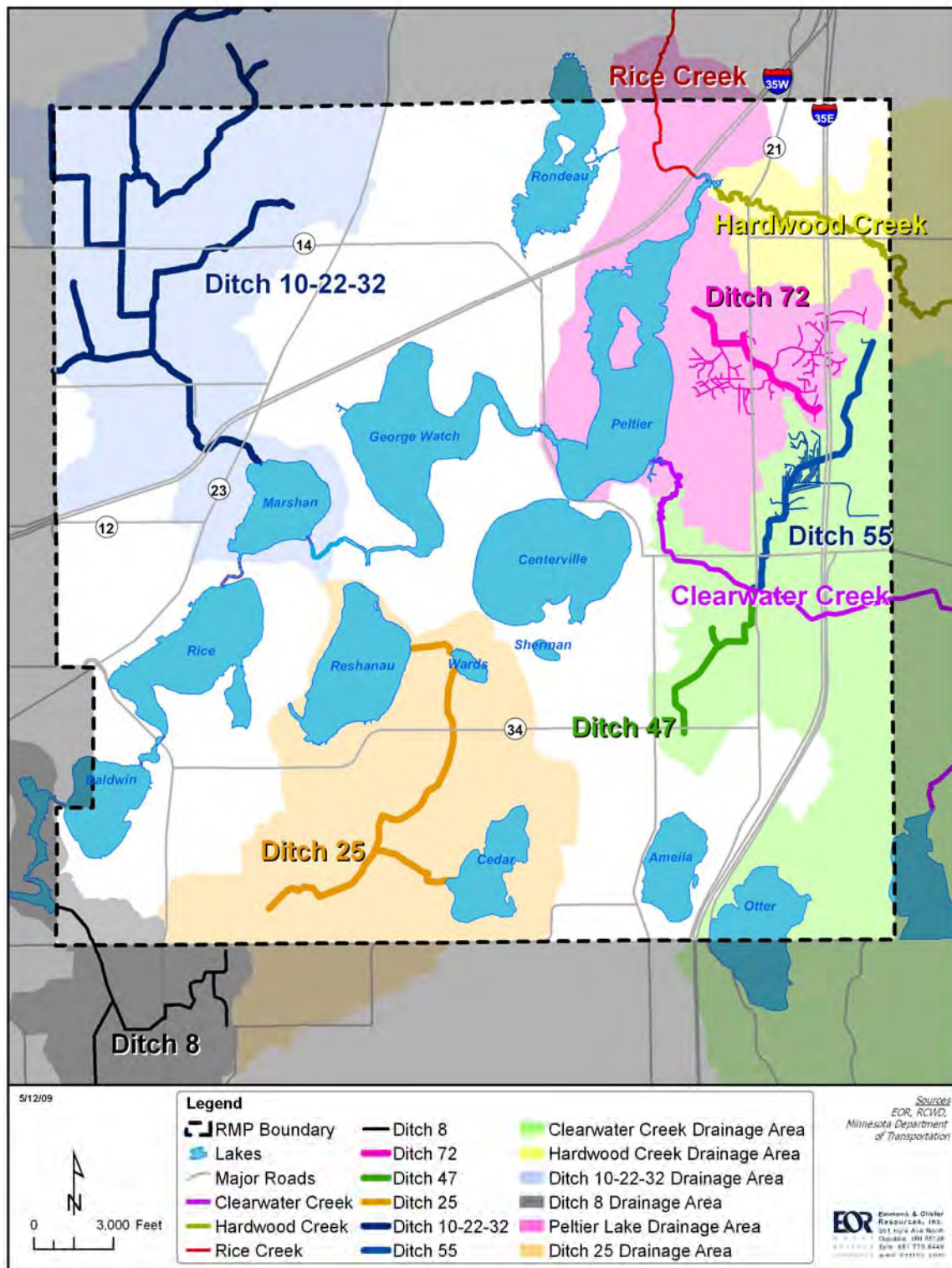


Figure 3. Drainage Systems in Lino Lakes

Watershed Stormwater Conveyance System

Lino Lakes is at a midpoint in the Rice Creek watershed. From Lino Lakes, Rice Creek flows west to the Mississippi River, as shown in Figure 1. Three large subwatersheds contribute to Peltier Lake: Clearwater Creek, Hardwood Creek, and Upper Rice Creek (Figure 4). Through Peltier Lake these subwatersheds contribute to the condition of the entire Chain of Lakes. The majority of the Clearwater Creek, Hardwood Creek, and Upper Rice Creek subwatersheds are located in communities outside of Lino Lakes.

A small area located in the southeast corner of Lino Lakes flows south into North Oaks and the Vadnais Lake Area Watershed Management Organization.

The system of swales, ditches, wetlands, ponds, and pipes that is identified as the Lino Lakes watershed conveyance system has been surveyed and modeled as part of the development of the SAMP to determine flow response under the 100-year rainfall event. Sensitive water level points in the system have been mapped. These points suggest a need to consider various options for wetland restoration, land use, and road planning in contributing catchments. Planning decisions require examining the catchment-scale and subwatershed-scale resources related to each point. Each of the sensitive water level points is given closer consideration at a subwatershed scale in the SAMP recommendations.

Nutrient Loads

Several waterbodies in the planning area are on Minnesota's 303d List for not meeting water quality standards (Figure 5). TMDL investigations for all lakes have been initiated, and the identified stressors are all nutrients and eutrophication. Clearwater Creek and Hardwood Creek are also on the 303d List for biotic impairments.

Peltier Lake has a large contributing drainage area, including Clearwater Creek, Hardwood Creek and Upper Rice Creek. The nutrient impairment to Peltier Lake is associated with the large drainage area and nutrient loading.

The 2010 status of TMDL projects in Lino Lakes is as follows:

TMDL Project Name	TMDL Status	Implementation Plan Status
Hardwood Creek TMDL	Approved	Approved
Peltier/Centerville Lakes TMDL	Approval Pending	Approval Pending
Lino Chain of Lakes	Approval Pending	In Progress
Bald Eagle Lake	In Progress	In Progress

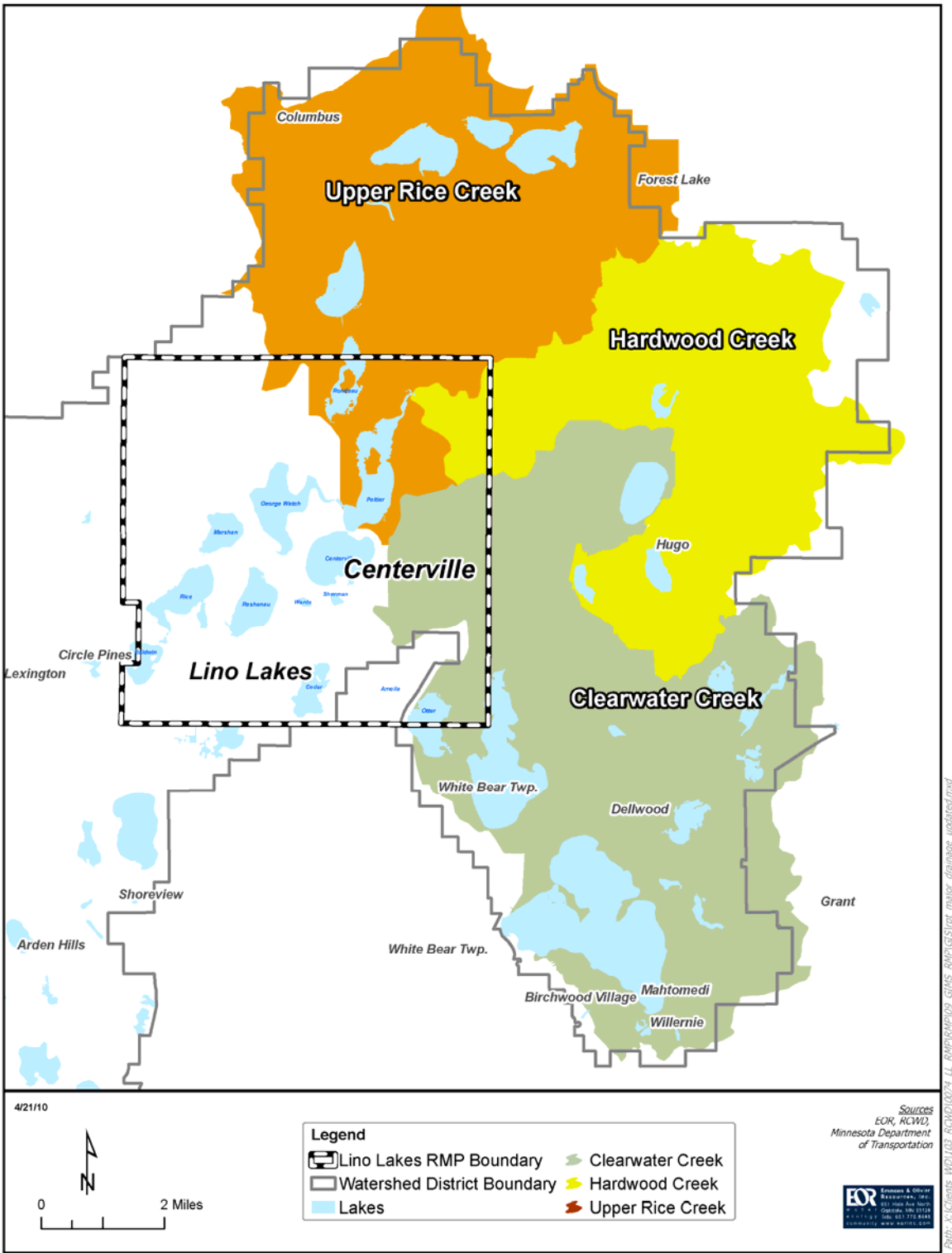


Figure 4. Contributing Creek Drainage Areas

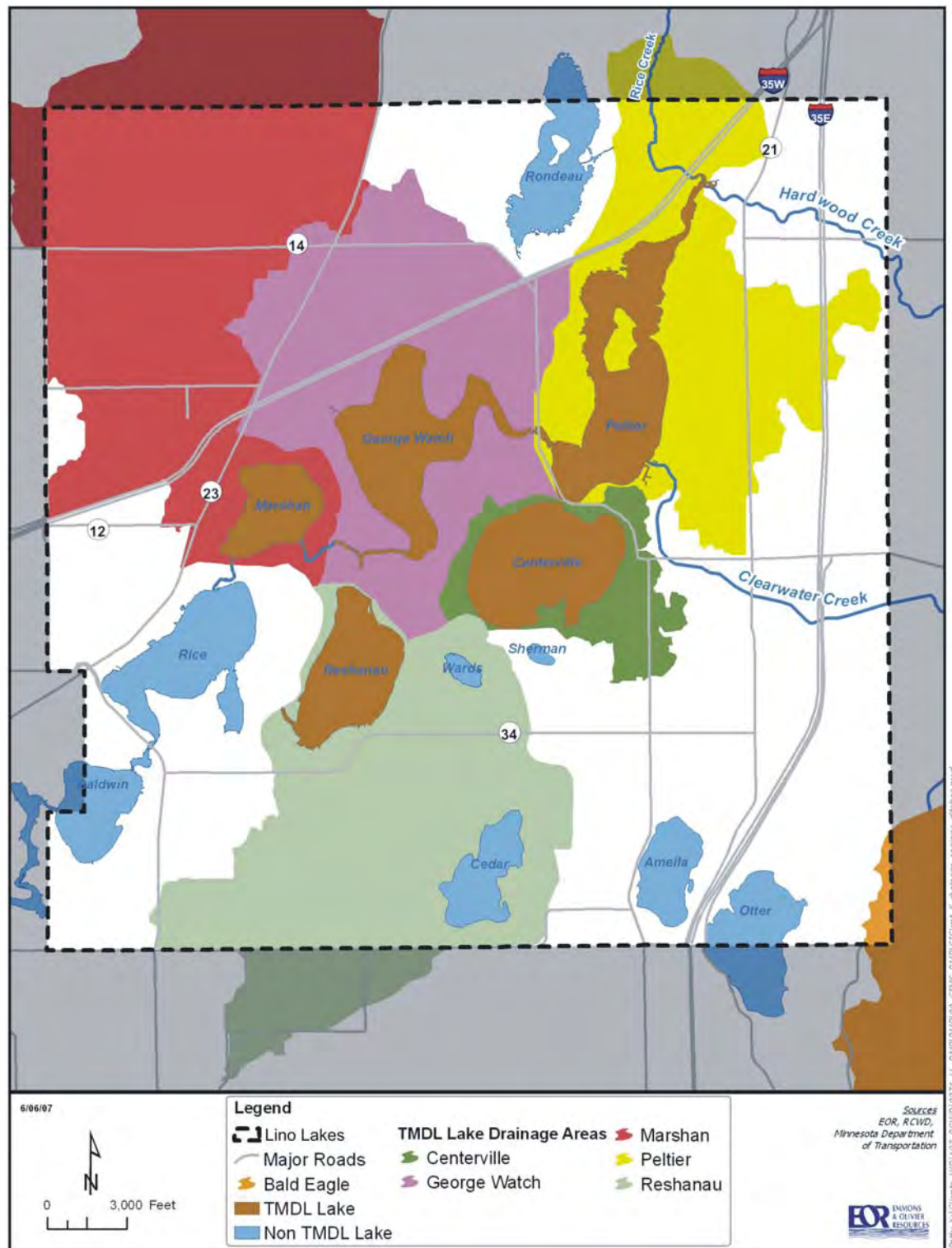


Figure 5. Lakes on the 303d List (TMDL target completion of 2010)

Centerville Lake is connected to Peltier Lake by culverts under Anoka County Road 14. Through these culverts, water can flow in either direction depending on the water elevation difference between the two lakes. Other than the occasional inflow from Peltier Lake, Centerville Lake receives surface water from a small direct drainage area only. Phosphorus loading from Peltier has a significant influence on the water quality of Centerville Lake.

George Watch and Marshan Lakes are significantly impacted by the high phosphorus loads coming from Peltier Lake. The direct drainage area to George Watch is relatively small and therefore contributes a relatively small load to the lake. Marshan Lake has a much larger drainage area (served by ACD 10-22-32) but still receives the majority of its nutrient load from upstream sources.

Wetlands are abundant and associated with the impaired waterbodies and contributing drainage areas. The question was addressed of whether the nutrient loading that contributes to impairment of lakes shows an association with quality of wetlands. The nutrient load modeling developed for the TMDL studies generated a relative ranking of subcatchment nutrient loading (high, medium, or low). This was used in conjunction with the wetland vegetation quality ranking to screen for a possible relationship. The relationship of the vegetation quality ranking and nutrient ranking are shown in Figure 6.

The high quality wetlands are located in catchments with either low or moderate nutrient loading. Low quality wetlands are located in all catchment types. High, medium, and low vegetative quality wetlands can also be found in a complex within the same contributing drainage area. This suggests no relationship between the two indicators used here to assess a relationship between wetland condition and the drainage area. USEPA publications on nutrients and wetlands have shown that nitrogen in the surface water tends to be more associated with vegetation quality than phosphorus. Other factors are also likely at work to allow for a range of wetland vegetative quality to persist in the same basin.

The lack of an association between wetland vegetative quality and catchment phosphorus loading may also be due to all the catchments having a high loading compared to reference conditions. The catchments in Lino Lakes have phosphorus concentrations that are at a minimum value of approximately 0.1 mg/L and range to over 10-fold higher at a maximum. Catchments with an outflow concentration of 0.2 mg/L or lower are given a ranking of “low”, between 0.2-0.3 mg/L are ranked “medium”, and over approximately 0.3 mg/L are ranked “high”. Almost all catchments exceed north central hardwood ecoregion standards for reference watersheds as defined by the MPCA, and this may partly explain the lack of an association between wetland vegetative integrity and catchment nutrient loading.

The loading information should still be considered useful for setting priorities on protecting wetland condition in Lino Lakes. It is important to know which areas are under the greatest stress from nutrient loading, because even without a direct relationship between vegetative integrity and phosphorus, the wetland stressors may be indirectly related to phosphorus loading. Any wetland restoration plan, regardless of location, examines the contributing catchments for their specific loading (both nitrogen and phosphorus), the loading sources, and the vegetation quality.

City of Lino Lakes Special Area Management Plan (SAMP)

The Status of Wetlands

A great diversity of wetlands exist in both large, diverse assemblages and scattered small or isolated basins throughout the City of Lino Lakes. Marshes and shallow lakes are the most common wetland habitats. Mapping accuracy follows the Minnesota Land Cover Classification System (MLCCS) and is not acceptable for wetland permitting decisions. Several site-specific natural resource mapping and field studies have been performed in Lino Lakes for various development projects. Aggregations of different wetland types indicate regions of higher biodiversity. Additionally Figure shows the connectivity of wetland areas into corridors.

Past alterations to wetlands were primarily agricultural ditching and draining. These activities resulted in areas that have hydric soils but are not mapped as wetland. These are considered fully drained wetlands. The fully drained wetlands can be seen as the concentrations of tan color in Figure 7. These soils are hydric but the areas were not identifiable as wetlands in the remote, landscape scale mapping of wetlands performed in the 1970s by the U.S. Fish and Wildlife Service. This mapping does not discriminate fully drained from partially drained wetlands.

These fully and partially drained wetlands provide the greatest opportunity for wetland restoration activities. Wetland restoration projects function to retain and treat stormwater and at the same time enhance natural resources, all of which were determined to be of highest priority for the citizens of Lino Lakes in the local public values survey conducted for the SAMP. The valuation of wetlands was conducted by Lino Lakes at a public open house in March 2007. A total of 31 community members completed a wetland values survey. Respondents ranked nine wetland-related values in order of importance from 1 (most important) to 9 (least important). The table below illustrates that surface water quality, groundwater quality, and wildlife habitat were the highest wetland values overall.

Importance of Wetlands to the Following Public Values*	Mean Score All Respondents (31) With 1 Being Most Important
Surface Water Quality	2.5
Groundwater Quality	3.0
Wildlife Habitat	3.3
Recreation/Education Uses (i.e. parks, open space, bird watching)	4.2
Flooding Prevention	4.2
Ecological Diversity (unique plants and landscapes)	4.8
Aesthetics (visual appearance)	5.6
Conversion to Upland for Development	7.3
Commercial Use (i.e. sod, peat mining)	7.6

* March 2007 Open House

As specified by the Minnesota Routine Assessment Methodology (MNRAM), the factors evaluated when considering a wetland for restoration include the number of nearby wetlands, hydrologic restoration potential without flooding structures, number of landowners involved, size, potential for a naturalized buffer, and restoration design complexity (see Reference Section for companion documents and details). As shown in Figure 8, wetlands ranked high and medium are considered high priority for restoration. Local wetland values such as Lino Lakes' interest in Tamarack Swamp restoration was also used in the evaluation.

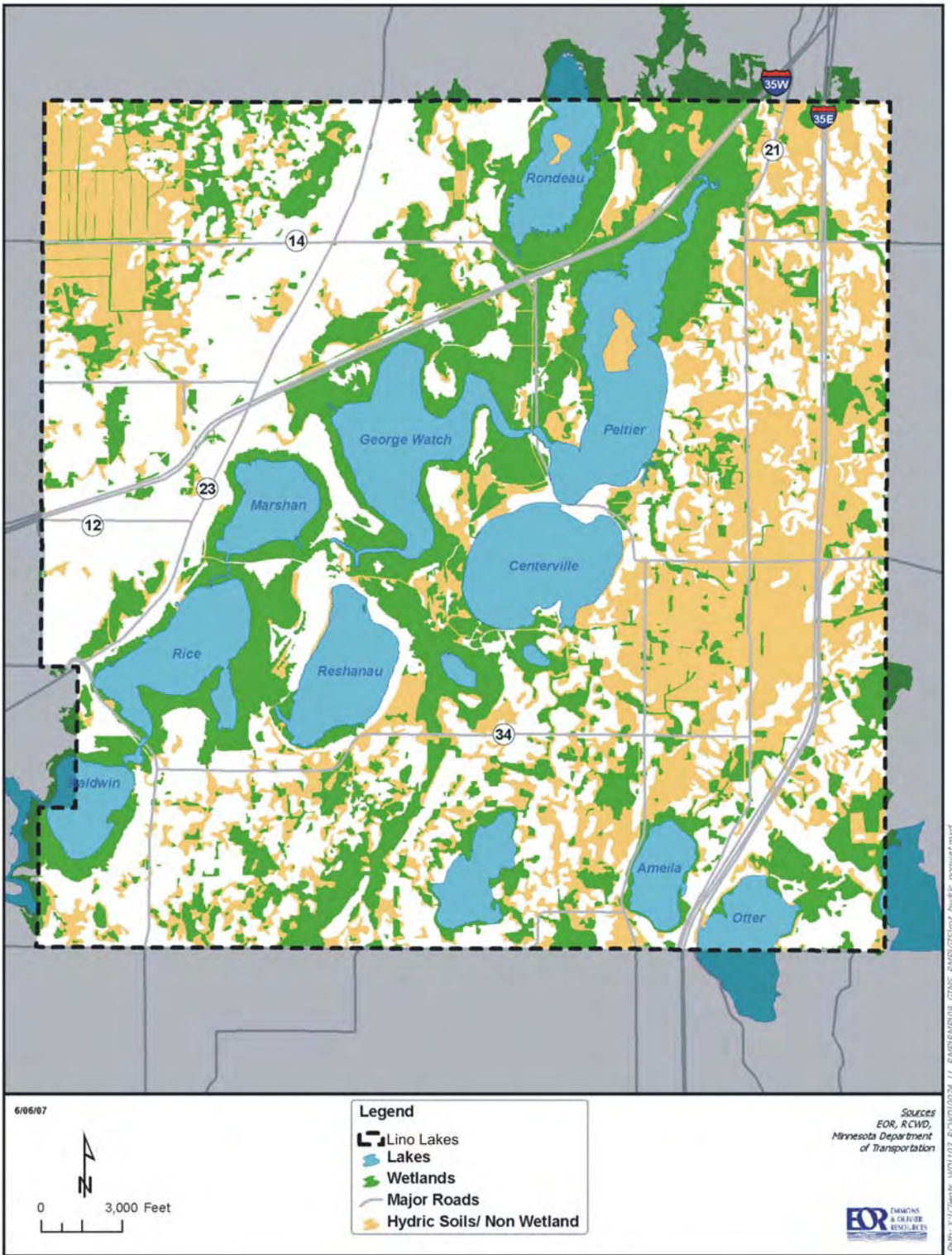


Figure 7. Likely Historic and Existing Wetlands

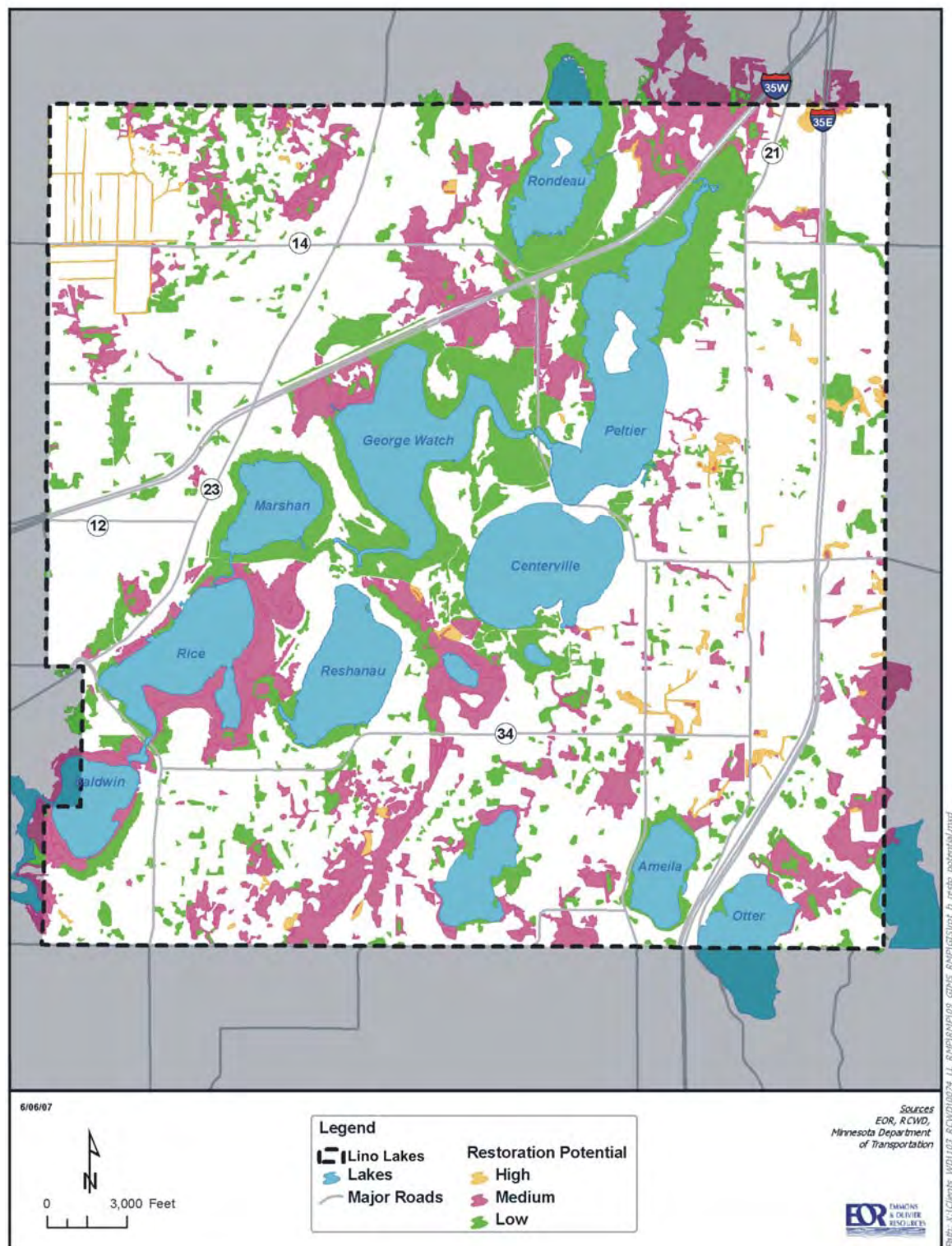


Figure 8. Wetland Restoration Potential

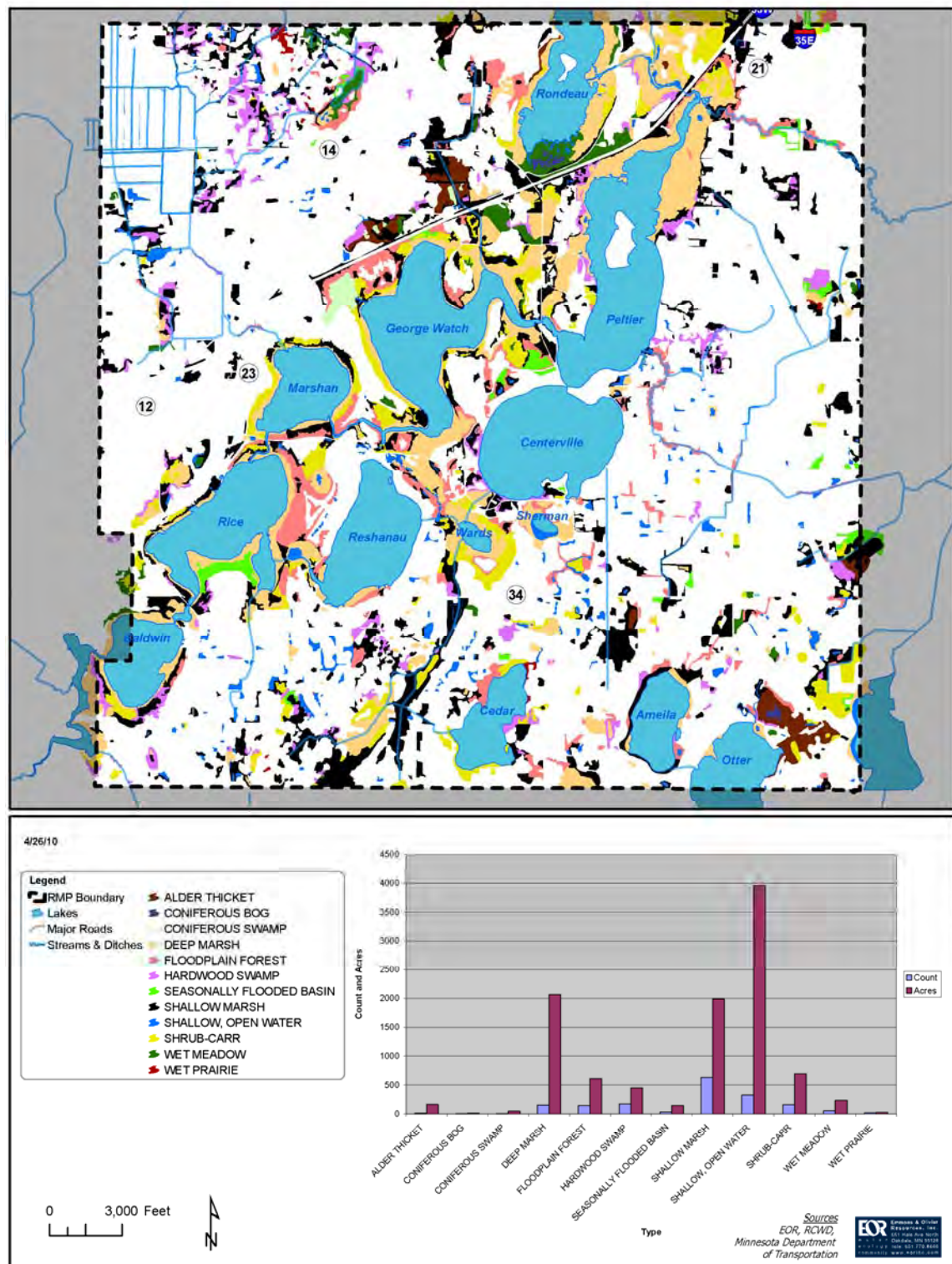


Figure 9. Wetland Plant Communities in Lino Lakes

Wetland Plant Communities

Figure 9 on the previous page illustrates the diversity and spatial distribution of wetland communities found in Lino Lakes. The wetland plant communities comprising the largest areal extent include marshes and shallow open water. Shrub carrs and wooded wetland communities make up the majority of the remaining wetlands in Lino Lakes. Coniferous swamps, alder thickets, bogs, wet meadow and wet prairie make a relatively small proportion of wetland communities.

High Priority Resources

State and federal wetland protection laws apply to wetlands in Lino Lakes. Both regulatory programs can be adapted to provide additional protection to these high quality resources. Additional protection can be afforded to those wetlands that exhibit high vegetative quality, high potential for restoration, create habitat connections, or harbor rare species. The high priority wetlands and associated resource preservation areas in Lino Lakes are shown in Figure 10. The upland resource preservation areas (identified in Figure 10 as “Resource Preservation Area”) are higher quality oak woodlands and forests.

The high priority resources were selected based upon a landscape-scale wetland functional assessment and the following data:

- Results of the city’s upland area development suitability analysis,
- Orchid monitoring,
- City conservation easements,
- Rare species points,
- Tamarack basins,
- Cedar Lake floodplain, and
- Rare plant community sites.

The RMP Rule for Lino Lakes provides additional protection measures to the high priority wetlands, and low quality, low priority wetlands will be afforded lower mitigation ratios and sequencing flexibility. From a Clean Water Act Section 404 perspective, the high priority wetlands may be considered as wetlands not suitable for fill and be subject to more stringent review requirements. Wetlands not identified as high priority will remain under the protection of standard wetland regulatory requirements, and will be evaluated in the context of watershed needs and how retention or establishment of wetland types in specific locations can fulfill those needs.

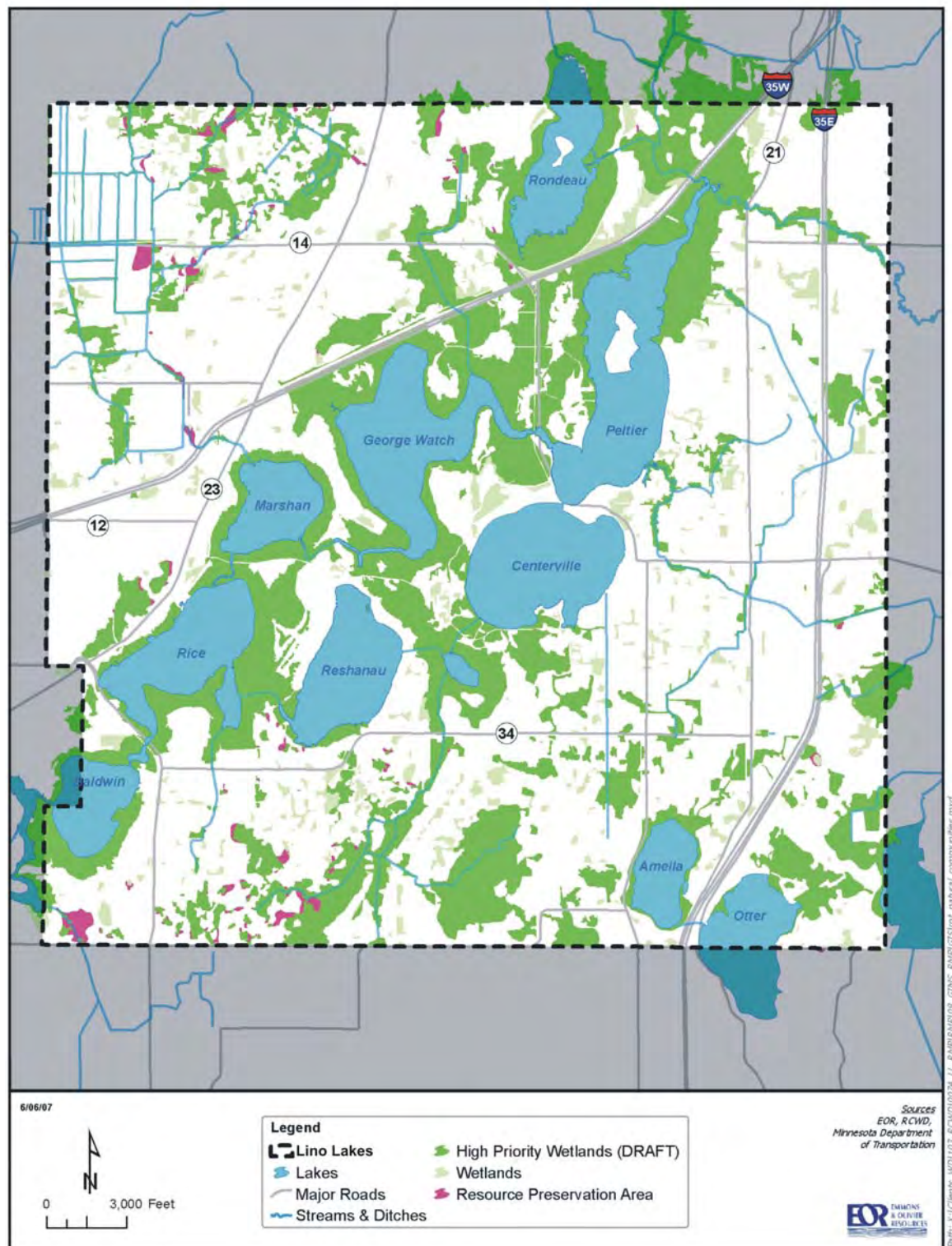


Figure 10. High Priority Areas in Lino Lakes

PROJECT ALTERNATIVES ANALYSIS FOR ECOSYSTEM-BASED WETLANDS CONSERVATION

Project Background:

The City of Lino Lakes has undertaken a number of interrelated planning efforts in conjunction with the Rice Creek Watershed District (RCWD). These efforts are diagrammed below. This section of the SAMP is prepared as a Project Alternatives Analysis (PAA) for Section 404 permitting and focuses on the relationship of the land use planning and effects on wetlands as regulated under the federal Clean Water Act (CWA) by the Corps of Engineers.

The Resource Management Plan (RMP) is complete. As of 2010, the TMDL studies are in late phases of completion and approval. The surface water management plan is scheduled to begin in late 2010 and will be based on the hydrologic modeling and approaches laid out in the RMP. As of the draft date of this SAMP, the City's Comp Plan is nearing final approval by City Council.



PAA Purpose and Need:

Minnesota Statute requires every municipality within the Minneapolis/St. Paul Metropolitan Area to prepare a comprehensive plan. The plan must be submitted to the Metropolitan Council, which reviews it to ensure consistency with Metropolitan Council policies. The City of Lino Lakes is classified by the Metropolitan Council as a “Developing” community. Developing communities are where the most substantial amount of new growth is anticipated to occur in the metropolitan area, or about 60 percent of new households and 40 percent of new jobs, through the year 2030. Lino Lakes needs to plan for 20 years of growth, which amounts to a projected 6,600 new households and 4,080 new jobs by 2030, and also identify post-2030 growth areas. The regional managed growth policy and comprehensive plan requirements established by the Metropolitan Council are intended to ensure that regional growth can be accommodated in an orderly fashion while enhancing the existing environmental, societal and economic resources found in the City of Lino Lakes. As such, the Lino Lakes Comp Plan is based upon an evaluation of the projected demand for housing, commercial and industrial job growth, transportation systems, public utilities (water and sanitary sewer), park, open space and recreation, as well as public values identified through a community visioning process and the underlying environmental resources throughout the city.

Development will occur after the year 2030, as will the potential for wetland impacts. Therefore, the comprehensive plan and analysis performed by the watershed district is looking beyond 2030, anticipating full build out of the community at an undetermined future date. In this way, the land

use alternatives analysis goes beyond the 20-year time frame mandated by state and regional policies and addresses potential impacts of a fully developed city.

In evaluating the amount and locations of land needed to accommodate projected growth, the Metropolitan Council advises that developments should be three to five or more dwelling units per acre, with higher densities near transportation corridors, and that no wetlands be included in the buildable area calculation (i.e., all wetland acres are subtracted – netted out - from each community's calculation of developable land available to accommodate forecasted growth). This calculation does not preclude wetland impacts. Direct impacts might still occur as a result of proposed actions that are accepted under state and federal wetland permitting as meeting all requirements for avoiding and minimizing impacts and providing for acceptable replacement. Other wetlands may accrue indirect and incremental negative effects due to a variety of cultural practices, removal of adjacent nonwetland habitat used by wetland wildlife, fragmentation of contiguous wetland habitat, and stormwater management plans that utilize wetlands for quantity and quality treatment.

To address the values of the city in evaluating both direct and indirect effects that may result from a variety of actions in years to come, the City of Lino Lakes and the RCWD developed a partnership to help accomplish mutual goals and implementation of wetlands protection as it relates to land use and watershed and stormwater management. The partnership has allowed for the preparation of the SAMP that provides for an evaluation of aquatic resources and primary external influences such as watershed runoff and habitat to be undertaken for the purpose of informing comprehensive planning decisions. This is unique in that state environmental policies are not intended to regulate local land use decisions, and yet numerous studies have indicated that land use decisions may underlie a variety of negative effects on wetlands and other aquatic resources. The desire of the community was to maintain and enhance the quality of resources under the future land use conditions through suitable comprehensive planning and associated rules and ordinances. In discussion with the Corps of Engineers about Section 404 wetland rules, a unique land use planning wetlands alternatives analysis was desired to assess the effects of land use planning on the resources. The SAMP geographic scale already reviewed by the Corps is at the watershed or landscape level and uses wetland location and boundary mapping at this scale, not onsite detailed delineation boundaries. The locations of impaired waters, high priority wetlands and other sensitive resources are being taken into account within the context of each subwatershed within the City, using models developed during the SAMP investigations.

The intention of the wetlands alternatives analysis is to comply with the Federal Clean Water Act Section 404 goal to ensure no net loss of aquatic resource functions and values while recognizing the need to accommodate projected growth in the region, and Lino Lakes in particular. The Lino Lakes RMP compares aquatic resource effects from three alternative land use scenarios. Aligning the RMP and Comp Plan with federal requirements for wetlands protection was done in cooperation with the Corps through the City's planning level alternatives analysis for wetland impacts. The RMP follows the Corps guidance for using a watershed approach to evaluating and replacing wetland function and values, and therefore was used as a framework for developing this SAMP.

Hereinafter, this document will be referred to as the SAMP.

In April of 2008 the new federal rule on compensatory mitigation describes a “watershed approach” to replacing losses of aquatic resources (Department of the Army, Corps of Engineers 33CFR Parts 325 and 332; Environmental Protection Agency 40 CFR Part 230). Subpart J §230.92 defines a watershed approach as well as watershed plan. The Lino Lakes RMP and this SAMP meet the obligations identified in the federal rule such as:

- It meets the specific watershed needs
- It describes preferred locations of mitigation activities
- It includes a landscape scale assessment
- It considers historic and future impacts
- And it considers aquatic and terrestrial connections.

Comprehensive Planning Elements as a Means of Reducing Negative Effects:

City-wide comprehensive planning is the proposed action being considered under the tenets of the federal CWA Section 404 rules and guidance for wetlands protection. The proposed action is rather unprecedented in complexity compared to typical proposed actions, such as a single private land parcel development or utility line. Nonetheless, evaluating proposed land development and use at the scale proposed here is reasonable now that, nationwide, substantial input and attention has been given to developing larger watershed-scale guidance for evaluating Section 404 permits.

Typically, a proposed action with the potential for negative effects on wetlands can employ a set of tools as reasonable measures for avoiding and reducing impacts. For example, designers of a road construction project can analyze criteria such as grade of inslope, road width, use of curves, and bridging. Such an analysis requires information on the specifics of the wetland, provided by wetland delineations. However, the proposed action under consideration—city-wide comprehensive planning—is not a construction project of defined location and scope. Good planning can identify potential impacts and identify tools that can be employed for the purpose of avoiding or reducing wetland impacts. However, because of the landscape/watershed scale of comprehensive planning, it is not possible to know exact locations and dimensions of impacts or to specifically list and mandate all tools for every possible development action.

The means by which wetland impacts were avoided and minimized at a landscape scale during the decision-making on the various land use planning elements are explained in this section. The Lino Lakes Resource Management Plan ²(RMP) contains the science and engineering data used throughout the Comp Plan process to consider how best to avoid and minimize impacts. The RMP Report provides the mapping and subwatershed-based recommendations for Comp Plan implementation to meet wetland impact and avoidance as described in this analysis. The RMP includes important information such as the Lino Lakes Drainage Route map and the Resource Management Unit (RMU) maps and recommendations.

² Lino Lakes Resource Management Plan, June 2008. Rice Creek Watershed District

The implementation of the various comprehensive plan elements are achieved with the following mechanisms that can incorporate all of the avoidance and minimization measures discussed in this section.

- Create design guidelines for new development to sustain unique natural features
- Establish a wetland/stormwater credit banking program
- Adopt the Resource Management Plan
- Implement the Resource Management Plan Rule (RMP-3)
- Update natural resource protection standards in ordinances

The bulleted items are identified in and consistent with Goal 9 in the Comp Plan, to sustain the community's natural resources and mitigate the impacts of development and redevelopment on natural resources.

Use of an Iterative Assessment Process and the Resource Management Plan

The landscape scale of the assessment is unique and just as important the iterative or repeated process of assessing impacts of major land use alternatives. The decision-making on land use by the City started early with the basic agreement that resource information would be available for the Citizen Comprehensive Plan Advisory Panel meetings held from March 2007 to August 2008. The sixth meeting in June 2007 introduced the high priority wetlands map that was then used as the basis for decisions in ten meetings after that. The subsequent land use alternatives were then subjected to indirect impact assessment, including hydrologic modeling, to determine the extent to which no net loss could be accomplished. The alternative to this iterative assessment process would have been to evaluate direct and indirect impacts after the series of Comp Plan meetings. This would have precluded the use of resource data in the decision-making process.

Early in the planning process the high priority wetlands map (developed for the RMP Report) was used to identify potential conflicts with future infrastructure development and avoid and minimize potential impacts from a number of different comprehensive plan components (i.e. wastewater system, roads, requirements for zoning). Later in the process, wetland and hydrologic modeling was used to identify locations for other land use planning elements (i.e., stormwater runoff, open space and wetland overlays). The hydrologic modeling evaluated the effectiveness of low impact development (LID) and green infrastructure stormwater management measures on a subwatershed scale for meeting volume reduction standards and mitigating indirect impacts to wetlands while also alleviating flooding risk to properties.

Land Use

The land use element of the Comp Plan assigns different locations in the city for residential, commercial, industrial, institutional, and open space development. It locates these different land uses according to their needs and potential impacts upon one another. The land use element also establishes a sequential or staging plan for the growth over time, based on infrastructure provisions that support the designated types and amounts of growth in their designated areas of the city. That is, the land use element describes how the city will develop- what types of development, where, and when.

Many of the facilities needed for development exist already in fixed locations. This fact cannot be overemphasized. The best example is the location of the interstate freeways and, more importantly, the interchanges that provide access to them. These interchanges are necessary facilities for the larger scale commercial development and the industrial uses that provide goods and services required for a growing metropolitan area. Therefore, the Comp Plan must designate land for commercial and industrial uses near the freeway interchanges. These issues are explained further below, but the point here is that certain location needs such as major transportation infrastructure are beyond the discretion of the City.

The vast majority of new development and redevelopment will occur in the areas designated Residential, Commercial, Industrial, and Mixed Use areas. In designating land use, certain locations that are already being considered for redevelopment or development were evaluated in the context of the high priority wetlands map. For example, the site on the northeast corner of Anoka County State Aid Highways 34 and 21 underwent an examination to determine the best future land use. Wetlands cover much of one side of the site and extend through the middle of the remaining property. To be economically feasible, a low density development typically would require numerous individual building sites spread out across a site. A more concentrated site plan could leave a larger undeveloped area, minimizing wetland impacts and increasing the possibility of creating effective buffers. The decision was to designate the site for mixed use development, which provides maximum flexibility for site design. This coincided with other planning objectives such as the need for a neighborhood commercial site, the need for higher density housing, and minimizing driveway access to the county highways. (A concentrated site design can function with fewer access points than typically are needed for multiple parcels.)

Residential housing growth is required to meet the future growth projections. This includes different housing types such as single family detached homes, townhomes and condominiums, apartments, and senior housing at low, medium, and high density of dwelling units per acre. Also a minimum amount of higher density, 8 units/acre of land is needed for affordable housing. Residential housing location has some restrictions such as planning low intensity uses like single family detached houses away from high intensity retail centers, and leaving space for road connections and access to open space and schools.

The first big decision on these land uses takes into consideration that residential housing development provides relatively more flexibility in siting of the building footprints and roadways than does commercial and industrial land use development. Feasible developments of the latter type use larger footprints and thus are less flexible in avoiding impacts to small wetlands on a particular land parcel under consideration. With this in mind, the major decision was to maintain the southern part of the city in residential where numerous small wetlands and Wetland Preservation Corridor (WPC) greenways are located. Residential housing using LID should offer better flexibility to avoid wetland impacts during final site design as compared to commercial and industrial sites, including indirect habitat and hydrologic impacts, and at the same time provide certainty that buildings will not accrue flood risk. This land use type will also take advantage of the numerous WPC greenways for open space value and wetland education value.

The future commercial and industrial areas are planned for one area along each existing interstate corridor, which is also where relatively fewer wetlands occur and high volume transportation access exists. The area along the I35E corridor was evaluated in the PAA for protecting existing wetlands that occur in larger complexes. Those plans and recommendations are shown in the RMP Report for the particular subwatershed in question.

Wetland Preservation Corridor Special Overlay Area

The Comp Plan incorporates the RMP Report locations for the wetland preservation corridor (WPC) with its variable width buffers into a Special Overlay Area. A special overlay district could be created with a city ordinance. This would be similar to a shoreland management overlay district or a floodplain management overlay under Minnesota statute. The requirements of the WPC overlay district would apply in addition to other requirements of the city's official controls such as the zoning ordinance, subdivision ordinance, or the shoreland and floodplain ordinances. It could incorporate the incentives developed in the RMP for avoiding direct and indirect wetland impacts and the plan for a wetland banking program.

Parks, Greenways and Trail System Plan (Park Plan)

The City Park Plan was updated in 2008 as part of the comprehensive planning process to reflect the additional demand for parks and recreation facilities that will occur from the growth that the city is anticipating and to incorporate the findings of the development suitability analysis and RMP. Much of this use is intended for locations in conjunction with the WPC overlay to maximize the ability of the city to create multifunctional greenway corridors for habitat, trails, wetland preservation and compatible low impact development stormwater volume reduction features.

Stormwater Management Plan (Resource Management System Plan for Green Infrastructure)

In addition to addressing wetlands, the RMP provides the basis for the City's stormwater management plan and the means to achieve flood damage reduction and avoidance in a way that natural subwatershed drainage boundaries are respected and wetlands are not relied on as water quality or volume management areas, which is an indirect impact on wetland quality. The Lino Lakes Drainage Route map in the RMP Report identifies the trunk drainageways for each subwatershed in the City. The system plan is incorporated into the Comp Plan. In addition, the RMP provides the plan for establishing a stormwater banking program.

The system plan presents a “working” multifunctional greenway corridor (commonly referred to as “green infrastructure”) that provides areas for LID stormwater management, upland buffer areas for wetlands protection, conservation of natural and semi-natural areas, as well as open space and trails for people. The greenway corridor includes the following attributes:

- Major and minor drainage routes that are the spine of the regional and local surface water management system providing areas for the natural movement of water;
- The WPC, with a combination of high priority wetlands, variable width buffer areas, the City’s marginally suitable development area nodes, the 100-year floodplain area, the diffuse greenway corridor linkage areas that connect the nodes, and the trunk ditch corridors;
- Connections between parks, open space, and the WPC for the movement of people and wildlife (often combined with a trail);
- Areas with low development suitability located outside the WPC. These areas contain a combination of rare species, natural and semi-natural habitat areas, and hydric soils.

Zoning Ordinance Requirements on Impervious Surface Reduction

In conventional development scenarios, assumptions are made on the expected amount of new stormwater runoff. The City’s zoning ordinance includes maximum impervious surface percentages for different types of development. Lowering the allowable impervious surface on new development would reduce runoff. This can be done and still retain the economic development value of a parcel without additional flooding risk, if the plans are developed using LID principles for stormwater management.

Water and Wastewater System Planning

Water and wastewater planning uses land area for the pipe systems and also pump stations and wells. The initial water system planning included the option of a watermain loop through the northern part of the city. This would have required extensive construction work through at least one-half mile of an area with many wetlands. Both the cost and the extensive wetland impacts involved led to the decision of an alternative plan to design the system in a different manner in a different location. The lower impact alternative is shown in the Comp Plan. In selecting this alternative, the City also acknowledges the link between the role wetlands play in improving water quality and their related importance to drinking water supply.

Transportation System Planning

The City must work collaboratively with county and state transportation planners. There are transportation plans that are somewhat beyond the authority of the City in deciding on alternatives to reduce wetland impacts. Transportation plan alternatives primarily under the control of the City were evaluated for effects on wetlands. In one of these, the initial alternative extended 62nd Street to the east to create a connection between two north/south collector roads. However, this would have required crossing an area of extensive wetlands, resulting in significant impacts. The iterative comprehensive planning process examined this area of potential impacts, that includes high priority wetlands, as defined by the RCWD analysis, and is a Regionally Significant Ecological Area, as defined by the Minnesota Department of Natural Resources. Comparing these data to the low potential traffic demand for this road resulted in the decision to delete the 62nd Street future road extension from the city’s transportation planning element of the Comp Plan.

Road Design Standards

The City will examine alternatives for revising its road design standards. Reducing the minimum pavement widths would reduce impervious area and runoff volume while also reducing volume of contaminants from winter road de-icing (sands and salts). Ribbon curbs and curb cuts, with roadside swales, infiltration, and biofiltration, combined with pervious pavements further protects water quality and reduces the need for a pipe system that channels concentrated runoff to water bodies.

Description of Land Use Planning Alternatives:

The scientific analysis being employed in this wetlands alternatives analysis considers both direct and indirect effects in a quantitative manner. In this analysis, evaluating indirect effects at the watershed scale is employed using models of wetland function. The effort involved is substantially higher than for the use of direct effect only. As such, it is critical that a complete vetting of potential land use alternatives be undertaken by stakeholders prior to selecting feasible alternatives for wetlands alternatives analysis.

The vetting process considered and dismissed various alternatives from analysis. The RMP Report provides the analysis of three alternatives. The alternatives and factors considered reasonable for retaining or dismissing potential alternatives are given below. In accordance with the Metropolitan Council requirements, all upland is considered developable from the standpoint of meeting future regional growth needs. None of the alternatives utilize housing densities that would require wetland as well as all upland to accommodate the space requirement. As stated earlier, this does not preclude potential direct and indirect impacts. The land use planning alternatives are thus best compared in terms of how they reduce potential for a wide variety of direct and indirect impacts to wetlands.

Alternatives Considered:

1. Maintain existing land use. This is defined as maintaining the existing land use designations and not planning for future growth. Existing local, state, and federal wetland permitting requirements are assumed. Impacts to wetlands would be from private land redevelopment and indirect effects from stormwater management plans and private land practices adjacent to wetlands. *This alternative was analyzed in the RMP Report.*

This option would not fulfill the city's regional growth requirements for 2030 and beyond as dictated by the Metropolitan Council. Accordingly, this is not a practicable alternative and was dismissed from further consideration. This is essentially the *No Action Alternative*, and a landscape level functional assessment was conducted for this alternative and will be compared to the practicable full build alternatives to show relative changes from existing to future conditions (Alternatives 4 and 5).

2. Utilize the existing 2020 Comp Plan and existing wetland permitting. This alternative falls short of the Metropolitan Council requirements for 2030 projected growth. The alternative was discussed in light of the value of performing a wetland effects analysis on an intermediary (between the present and 2030) growth level.

This option would not fulfill the city's requirement to submit a 2030 Comp Plan (e.g. a plan that addresses projected land use and population growth by the year 2030), as dictated by the Metropolitan Council. Accordingly, this *2020 Status Alternative* is not a practicable alternative and was dismissed from further consideration.

3. Provide for full build out (2030 growth and beyond) and avoid all direct wetland effects within the City, regardless of source. No direct impacts (excavation and fill) would be allowed to any wetlands within City, by any action, regardless of wetland priority (e.g. high or in the WPC). This would result in 100% avoidance of direct impacts. No additional land use planning tools or rules for reducing indirect impacts are employed. This is the *Full Avoidance Alternative*.

Although this is not a practicable alternative for the city, it will be evaluated to serve as a baseline for an impact comparison among the practicable alternatives evaluated (alternatives 4 and 5). It will also be evaluated as the full wetland avoidance alternative under both WCA and CWA regulations

4. Provide for full build out and assume the historical rate of wetland impacts and compensatory mitigation. The alternative uses a 2:1 replacement for all impacts (assumed to be a minimum). The percentage of replacement credits provided outside and inside the City will be evaluated in this alternative, and the net change will be used in the 2030 analysis. This is the *Status Quo Alternative* to be compared to alternatives 3 and 5.
5. Provide for full build out and avoiding and minimizing aquatic resource impacts through a variety of land use planning tools, rules, and ordinances. The alternative applies rules and ordinance to high priority wetlands in addition to existing state and federal wetland permitting. The wetlands were prioritized using watershed modeling in conjunction with habitat assessment, landscape-scale corridors and remote functional assessment. This alternative creates incentives to avoid high priority wetlands through higher mitigation ratios, locates replacement activities adjacent to natural wetland corridors (i.e., within the WPC), and identifies variable width habitat buffers and habitat conservation areas. This alternative assumes a minimum of 2:1 acre of replacement for high priority wetlands and 1:1 for all others. This alternative includes a transportation plan that considers road alignments that minimize impacts to and fragmentation of WPCs. It also provides the basis for the City's stormwater management plan such that natural subwatershed drainage boundaries are respected and wetlands are not relied on as water quality or volume management areas, an indirect impact on wetland quality. This is the *Resource Management Plan Alternative* and was analyzed in the *RMP Report*.

It is anticipated this alternative, on a landscape scale, would be the least environmentally damaging practicable alternative, as compared to alternative 4. In addition, it is anticipated that this alternative would result in no net functional loss, on a landscape level as compared to the No Action alternative (Alternative 1).

Analysis Performed:

Alternatives 1 and 5 were analyzed and presented in the LL RMP. Alternatives 3 and 4 were defined for this study and rely on new data but also modeling from the RMP Report for full build effects. The RMP report focused on function-based comparison, and this along with direct effects is the focus in this alternatives analysis. The functional assessment methodology is contained in the RMP and its Appendix.

Alternative 3 and 4 functional analysis presumes that all upland area is buildable. Functionally this reflects watershed drainage areas with no upland buffer for any wetlands, open space corridors, or new rules for regulation of runoff volumes. The scoring of wetland functions will be the same for all wetlands. They differ in that no wetlands are filled or excavated for Alternative 3.

Alternative 4 functional analysis will presume conditions like Alternative 3 and also the historic change in *quantity* of wetlands. The quantity change will not be reflected in the functional scoring of wetlands. The historic rate of change is determined by reviewing completed development projects which required wetland permitting. The kinds of change include *de minimus* losses, export (outside of Lino Lakes) of wetland via approved banking, import of wetland via excess replacement credits in Lino Lakes, and no acreage change (Lino Lakes wetland losses replaced within Lino Lakes).

The methodology for alternatives comparison as described above is summarized in the following table.

Table 1. Description of Wetland Alternatives

Alternative	Description	No Net Loss in Quality (indirect impact) Assessment	No Net Loss in Quantity (direct impact) Assessment
3. Full Avoidance Alternative	Full build land use and existing rules	No: buffers, WPC, runoff limits, or ecological restoration	No direct loss
4. Status Quo Alternative	Full build land use, existing rules, historic rate of wetland change projected out 22 years	No: buffers, WPC, runoff limits, or ecological restoration	Historic rate of wetland change
5. RMP Alternative	RMP-based full build out, RMP-3 Rule	Buffers, WPC, runoff limits, ecological restoration	Assume a historic rate of wetland loss and all replacement to occur within LL according to the RMP-3 Rule

Findings:

Full Avoidance Alternative #3

The Full Avoidance Alternative is anticipated to have no loss in *quantity* of wetlands. The alternative by definition precludes filling of wetland. However, the *quality* or functioning of wetlands can be expected to be reduced as a result of indirect impacts. Indirect impacts occur from changes external to the wetland such as the condition of upland adjacent to and in the watershed drainage area of the wetland. The results of these changes are measureable in the downshift in wetland functioning from high or medium to a lower level. Appendix 1 and 2 of this section provide a breakout of these data. The maps in Appendix 1 can be compared side by side between the Existing Conditions and Full Avoidance/Status Quo Alternatives for each of five functions. The maps show the functional level of individual wetlands and the loss or gain in function. The map legend shows the total in acres of all wetlands that function at each level. The change in all wetlands summed together from Existing Conditions to each future alternative can be seen by comparing side by side the graphs in Appendix 2. The bars graphs represent the shift at the scale of the city as a whole. All five wetland functions evaluated will be reduced under the Full Avoidance Alternative #3. Appendix 2 provides an explanation of each function and the factors attributing to measured loss or gain in function from each alternative.

Status Quo Alternative #4

The Status Quo Alternative is expected to have the same reduced *quality* or functioning as the Full Avoidance Alternative. This is because the alternative does not provide for standards that apply to upland conditions adjacent to or within the watershed. The Status Quo Alternative is expected to result in reduced wetland *quantity* in Lino Lakes. The finding is based upon analysis of the recent wetland permitting history in Lino Lakes. The historic rate of wetland change was calculated based upon records from all permits for projects in Lino Lakes dating back to 2001 (Table 2). Projects affecting wetlands prior to 2001 did not have well documented descriptions of impacts and replacement. Between 2001-2008, wetland losses from all impacts totaled 37.8 acres. The replacement of these losses within Lino Lakes, including new wetland credit, public value credit, and stormwater pond credit, totaled 25.4 credits. The impacts replaced outside of Lino Lakes amounted to 20.8 credits. Thus, although over a 1:1 replacement credit ratio exists, there was an export of wetlands from Lino Lakes (20.8 acres of replacement outside of Lino Lakes, principally from a county transportation project.

Table 2. Wetlands Quantity Change in Existing Growth Stage From 2001-08

Total Wetland Impacts (acres)	Wetland Impacts Non-transportation (acres)	Replacement Within Lino Lakes (credit acres)	Replacement Outside Lino Lakes (credit acres)	Annual Wetland Export Rate for Lino Lakes Wetlands (credit acres per year, 20.8/7)
37.8	18.7	25.4	20.8	3.0

During the 2001-2008 existing growth stage, thirty percent of the replacement credits were from stormwater ponds, but new state rules will not allow this type of replacement credit in the future.

The relative rates of future growth were used to estimate potential wetland impacts in the future (Table 3). Stage time periods are based on the planned expansion of sewer and water services by the City and Metropolitan Council, a key factor in the timing and location of future growth. City staging alternatives are evaluated in the Comp Plan. In summary, future growth rates were calculated based upon the gross acres of land developed during the existing growth stage as compared to the gross acres anticipated in each future growth stage.

Table 3. Future Growth Stages of Lino Lakes and Relative Growth Rate\

Future Growth Stage	Growth Stage Time Period	Future Growth Rate Relative to Existing Stage*
1	2008-2020	2.9
2	2020-2030	1.8
3	Post 2030	5.3

* Growth rate of Existing Stage (2001-2008) is set at 1.

The relative future growth rates were applied only to non-transportation wetland impacts (Table 4). The county/state transportation impacts were estimated from best available data from the county highway department for their planned road expansions. The transportation impacts are from specific projects planned for the future and are not tied to a particular growth stage or rate of growth. The future wetland impact estimates were then based on the sum of all impacts (Table 5).

Table 4. Projected Future Non-transportation Wetland Impacts in Lino Lakes*

Future Growth Stage	Growth Stage Time Period	Non-Transportation Wetland Impacts (acres)
1	2008-2020	54.2
2	2020-2030	33.7
3	Post 2030	99.0
All Future Stages		187

*the potential impacts under existing state and federal rules (Alternative #4, Status Quo)

Table 5. Projected Future Wetland Impacts in Lino Lakes

Growth Stage	Other Wetland Impacts (acres)	County Transportation Impacts (acres)	Total Wetland Impacts (acres)
Existing Stage (2001-2008)	18.7	19.1	37.8
All Future Stages to Full Build Out	187	28*	215

* Per Anoka County Highway Department Projections.

The estimate of future wetland impacts is valuable for considering how and where wetland replacement shall occur. Any replacement that occurred in Lino Lakes by transportation projects was not required by WCA, and under the Status Quo Alternative, there is no mechanism precluding replacement of future transportation wetland impacts outside Lino Lakes.

RMP Alternative #5

The RMP Alternative can potentially have the same *quantity* impacts as the Status Quo Alternative. The RMP Rule has weighted incentives for avoiding impacts to certain types of wetland in certain locations such that impacts to high priority wetlands should be substantially reduced compared to the Status Quo alternative. “Guiding where wetland impact and replacement may occur is intended to have the effect of reestablishing larger, contiguous areas of wetland and riparian edge”, as stated in the rule preamble, has led to permit steps with further and further upfront in the decision-making process. The more explicit permit process and weighted incentives for avoiding impacts were not in existence during the existing (2001-2008) growth stage and thus their effect on reducing future impacts cannot be quantified. The RMP Rule provides for non-transportation wetland replacement in Lino Lakes, and planning for replacement of future impacts should use the full estimate provided in Table 5, even though effort will be made to reduce that number. As Lino Lakes plans opportunities for high quality wetland replacement within the City that are consistent with the RMP Rule, it is feasible to incentivize county transportation wetland replacement in the city, thus avoiding export of wetlands from transportation replacement. Wetland replacement credits based on Table 5 should be initiated such that replacement is consistent with the state and federal requirements of ‘in-advance’ replacement. The City can provide these credits for future sale. Periodically, the City can assess the actual growth and determine whether approved wetland replacement credits developed for future growth stages will meet or exceed demand and then consider whether to sell credits for projects outside of Lino Lakes or to retain the credit for future needs of projects in Lino Lakes. In 2008, the wetland credits for impacts in the metro area that are drawn upon by eligible public transportation projects are valued at \$35,420/acre. The opportunity areas for wetland replacement credit are identified in the RMP Resource Management Unit descriptions. As a similar example, in the nearby City of Blaine, it was decided to invest in a large wetland restoration project that will produce credits for this purpose.

The RMP Alternative can maintain or improve wetland *quality* compared to Existing Conditions and provide substantially better quality compared to the Status Quo and Full Avoidance alternatives (Figure 11). For each function, the RMP Alternative #5 provides no large reduction in any function when viewed at the scale of the City as a whole. A breakout of the data in Figure 13 and description of each wetland function is provided in Appendix 2, in order to provide an explanation of the differences.

Individual wetland functional changes can be viewed by comparing the maps in Appendix 1. At an individual wetland scale, reductions in one function or another can be observed. Some of this was addressed in the RMP Report in which a more detailed analysis of hydrologic regime for selected wetlands was performed. The findings show that by following the standards in the RMP rule many, but not all, wetlands can be protected from adverse indirect effects of watershed runoff. This means that some wetlands are still subject to a net loss of hydrologic regime function. As recommended in the RMP Report, small scale development site planning would need to take this into consideration in order to avoid indirect effects to certain wetlands. The locations of wetlands not fully protected by the standards in the RMP Rule are identified on the RMU maps.

The RMP-3 rule that applies to the RMP Alternative has stipulations for protecting function of existing wetlands and also restoring or increasing functions in certain areas. Figure 12 and Figure 13 show the distinction in land use alternatives as a result of incorporating criteria from the rule into land use decisions. Figure 12 shows the presence of the corridor overlays with wetland buffers and habitat areas. The effect of these land use tools is measureable at a city-wide scale as a protection of wetland function (Appendix 2 figures). The vegetative integrity and water quality functions are measurably different in the RMP Alternative, and the city-wide overlay providing for habitat buffers is a large part of the measurable difference.

The protection of wetland hydrologic regime function in particular would result from volume reduction standards regarding watershed runoff. As discussed in the RMP Appendix 2, hydrologic modeling of the future full build out strongly indicates that future growth can be accommodated by incorporating the volume reduction standards without a capacity-expanding infrastructure. Figure 11 and Figure 12 show the sensitive water level points that are being addressed by RMP Rule standards. The RMP recommendations address flood hazard from future growth without a capacity-expanding infrastructure. Developing new capacity-expanding infrastructure to address flooding of the sensitive water level features would end up decreasing wetland function and thus the RMP Alternative would not have the benefits shown in Figure 13 or PAA Appendix 1. By avoiding capacity-expanding infrastructure, the hydrologic functioning of wetlands is maintained as a whole throughout the city. The future conditions hydrologic modeling, including more detailed plans for specific sensitive water level points, is reported in the Lino Lakes RMP.

Land Use Types and Overlays for the Wetlands Alternatives Analysis

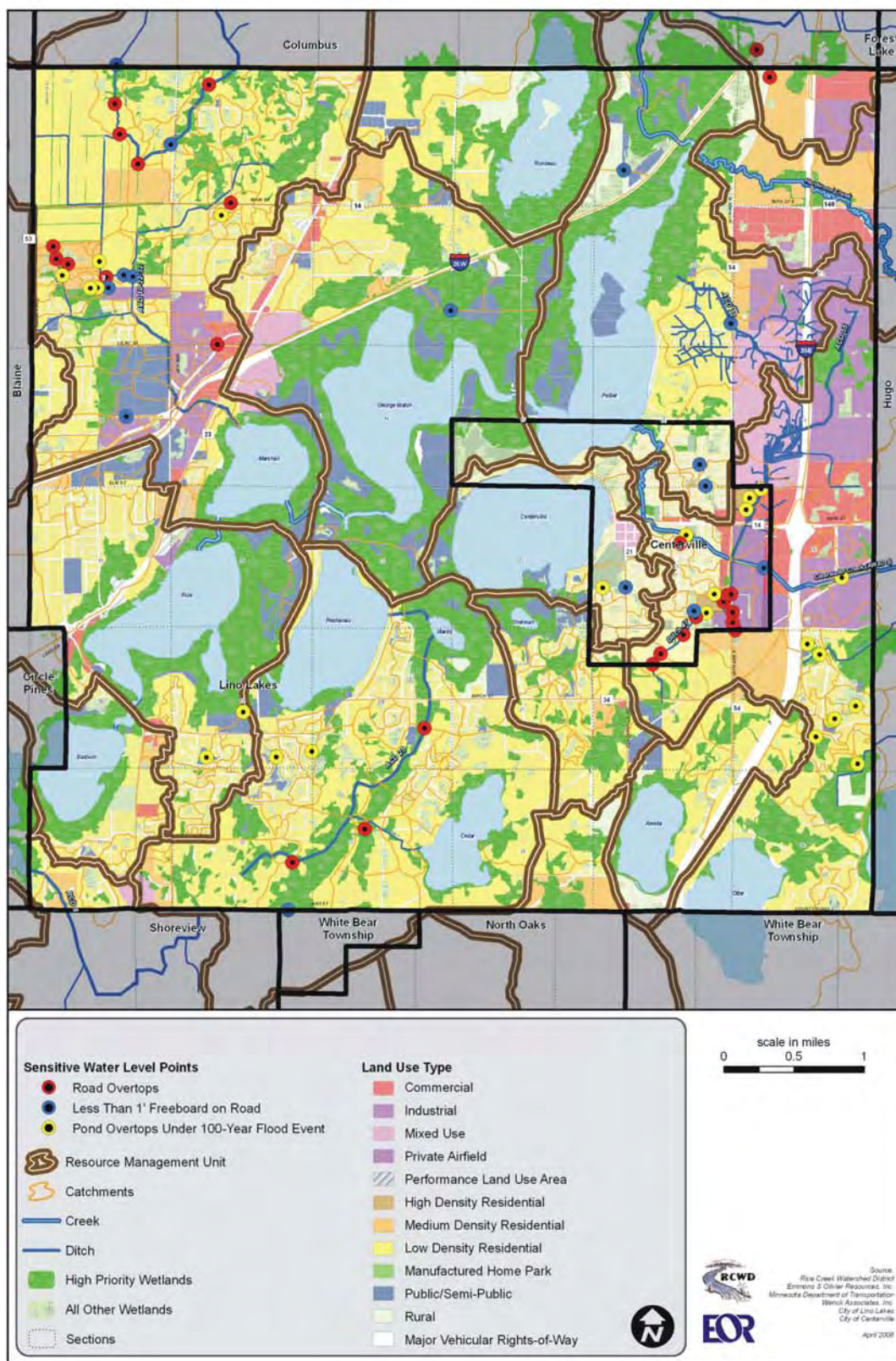


Figure 11. Land Use for the Full Avoidance and Status Quo

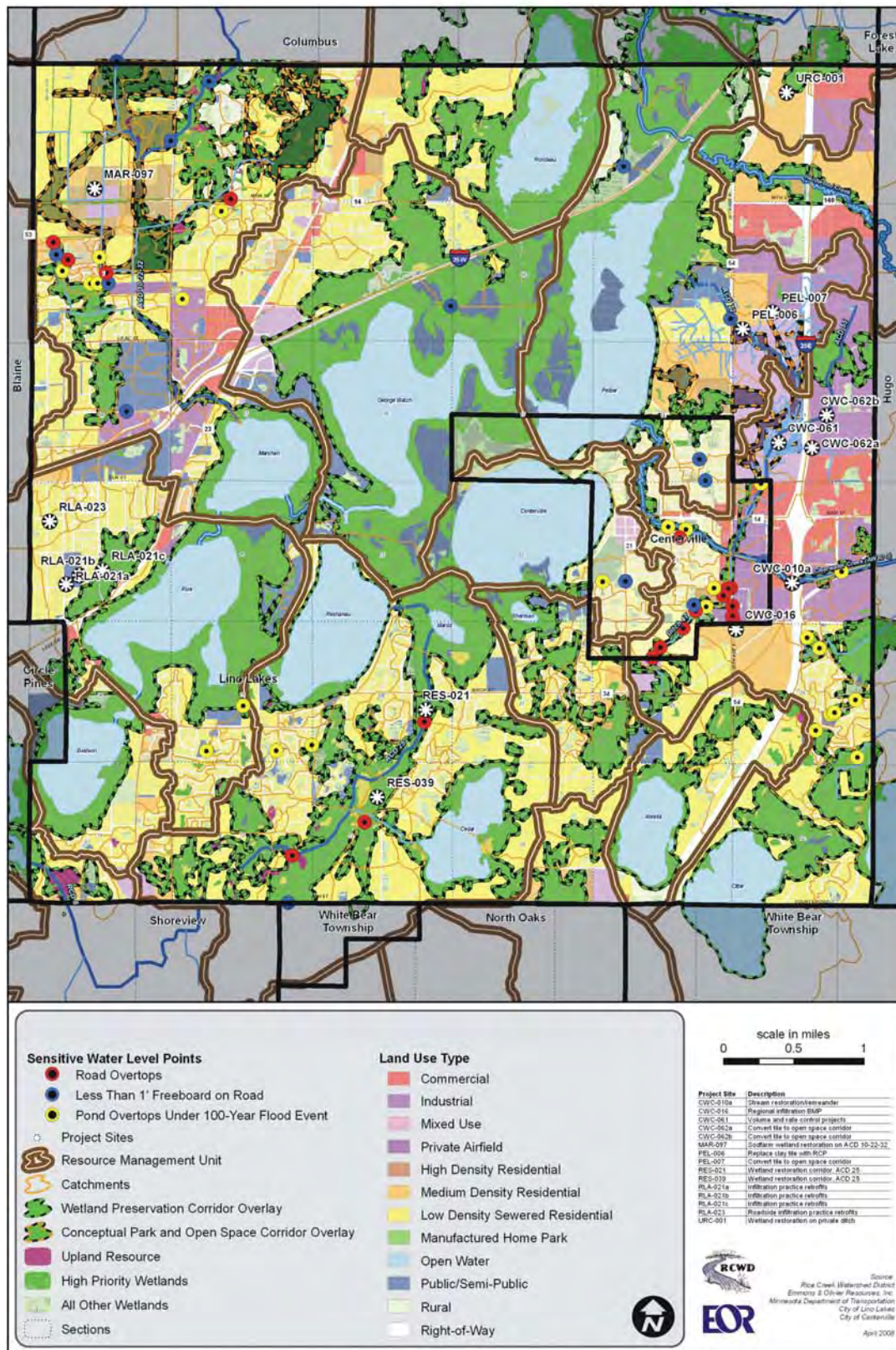


Figure 12. Land Use for the RMP Alternative

Summary:

An evaluation of land use alternatives for direct and indirect effects on wetlands for the future growth of the city was undertaken. Avoiding net loss of wetlands is relative to the geographic scale of evaluation. Avoiding export of wetland area from the city requires providing for wetland banking opportunities, primarily for county transportation projects, in-advance of project permits. Utilizing the RMP rule would provide much of the replacement in the city, but not all. Avoiding net loss of wetland quality was evaluated at a watershed scale using functional models. Hydrologic modeling, employed in the RMP and used for evaluating future wetland function, shows that by incorporating volume reduction criteria, net loss of wetland quality at a watershed scale can be avoided. However, examining selected individual wetlands for effects from future changes to watershed runoff showed that net loss at a local scale of some wetland function may still occur. Additional measures above the standards in the RMP Rule may be considered at the permitting stage to avoid this net loss in function for an individual wetland.

Overall, the RMP Alternative is able to achieve no net loss in wetland quality. As shown in Table 6, the five functions evaluated did not shift in functional capacity from high or medium to lower functional capacity. The Full Avoidance alternative is able to achieve no net loss in wetland quantity (Table 6) through avoidance of impacts. The Status Quo and RMP Alternative currently do not allow for all wetland impacts to be replaced in Lino Lakes, thus providing the potential for export of wetlands from the city. However, the RMP Alternative discourages export of replacement wetland from non-transportation projects, and this export can be further prevented by developing wetland banks within the city to accommodate the expected transportation need.

Table 6. Summary No Net Loss Analysis of Three Comp Plan Alternatives

Alternative	Potential Wetland Export From 2008 to Full Build (acres)	Net Change in Wetland Quality From 2008 to 2030 (predicted outcomes of five functions)		
		Primarily High Function Shifted to Low	Primarily High Function Shifted to Medium	Mixed Function Shifted to Medium or Low
3. Full Avoidance	0	0	3	2
4. Status Quo	28	0	3	2
5. RMP	28	0	0	0

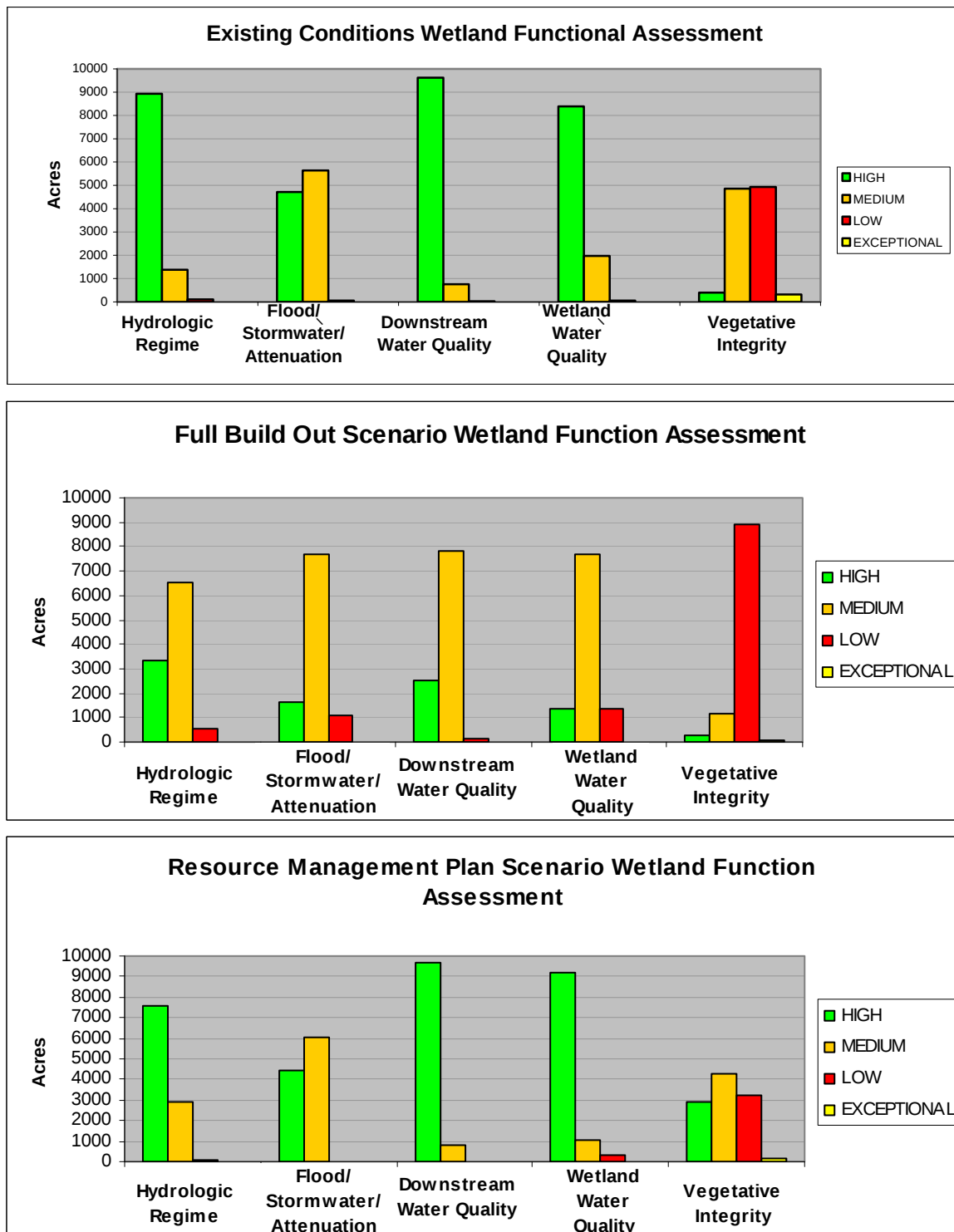


Figure 13. No Net Loss in Wetland Quality Alternatives Comparison¹

¹Full Build Out Scenario the Full Avoidance and Status Quo Alternative. Resource Management Plan Assessment is the RMP Alternative.

PAA APPENDIX 1: INDIVIDUAL WETLAND FUNCTIONAL DIFFERENCES BETWEEN LAND USE ALTERNATIVES

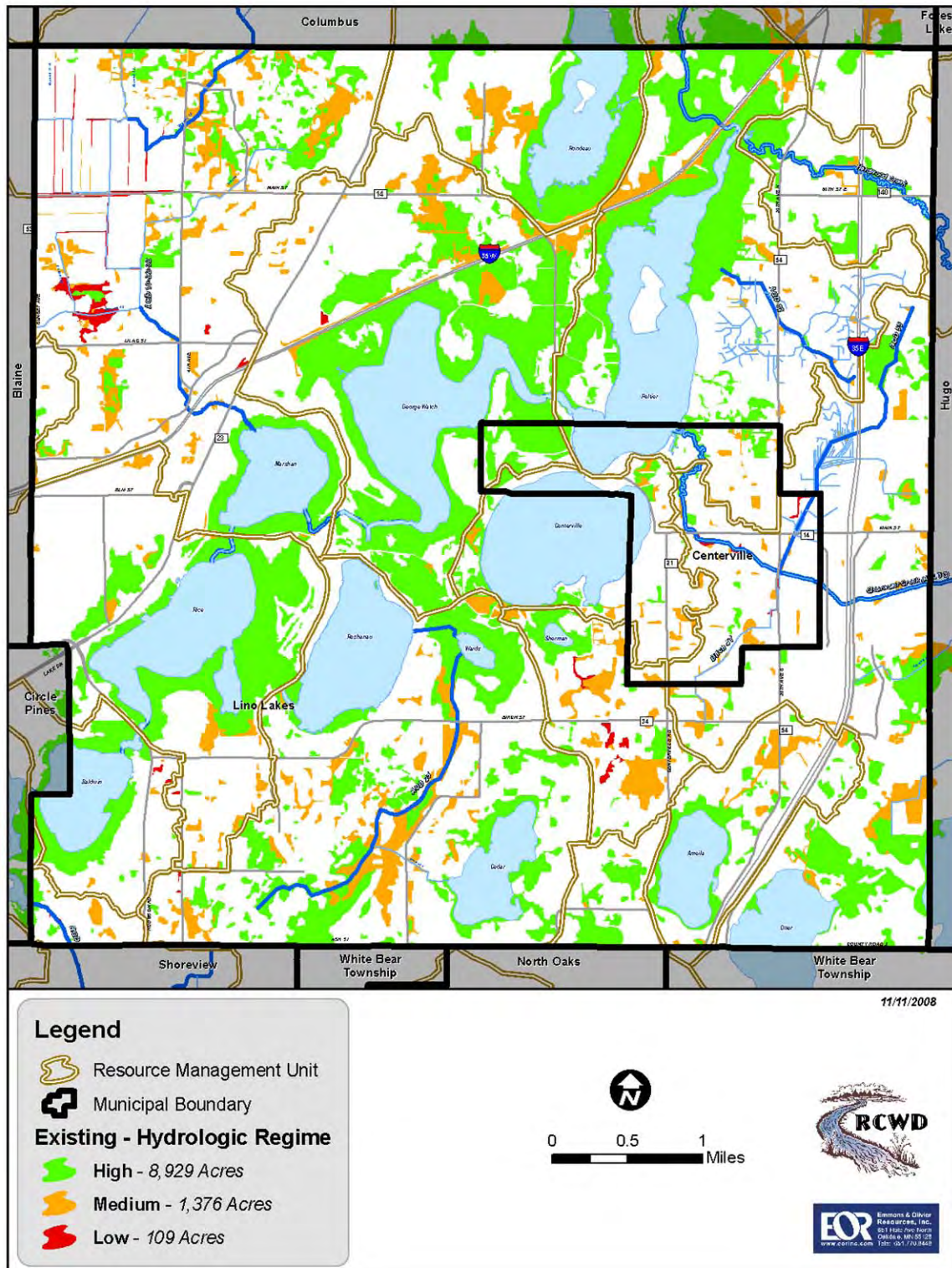


Figure A-1.1a. Existing Conditions Wetland Hydrologic Regime Function

City of Lino Lakes Special Area Management Plan (SAMP)

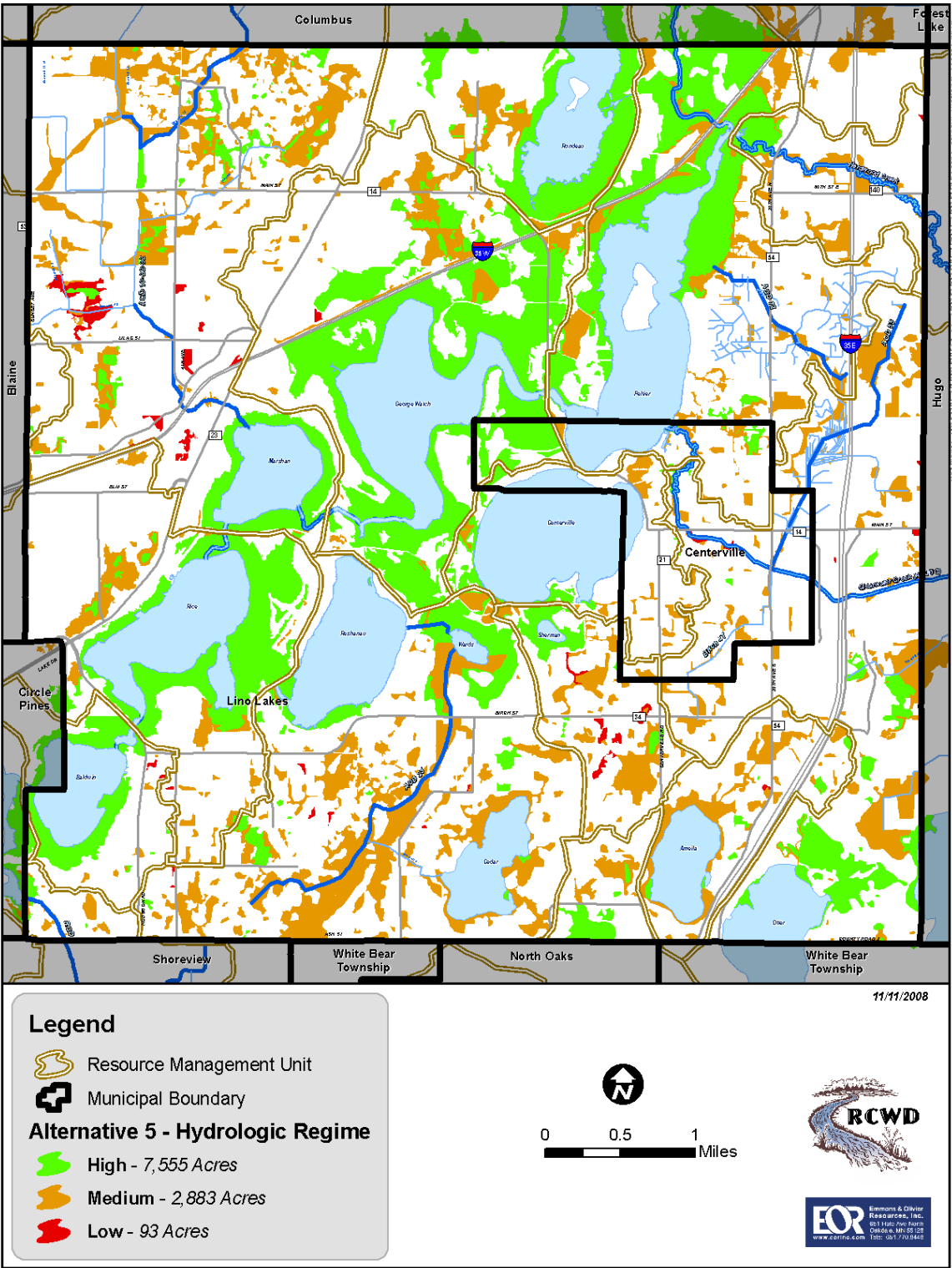


Figure A-1.1c. RMP Alternative Wetland Hydrologic Regime Function

City of Lino Lakes Special Area Management Plan (SAMP)

City of Lino Lakes Special Area Management Plan (SAMP)

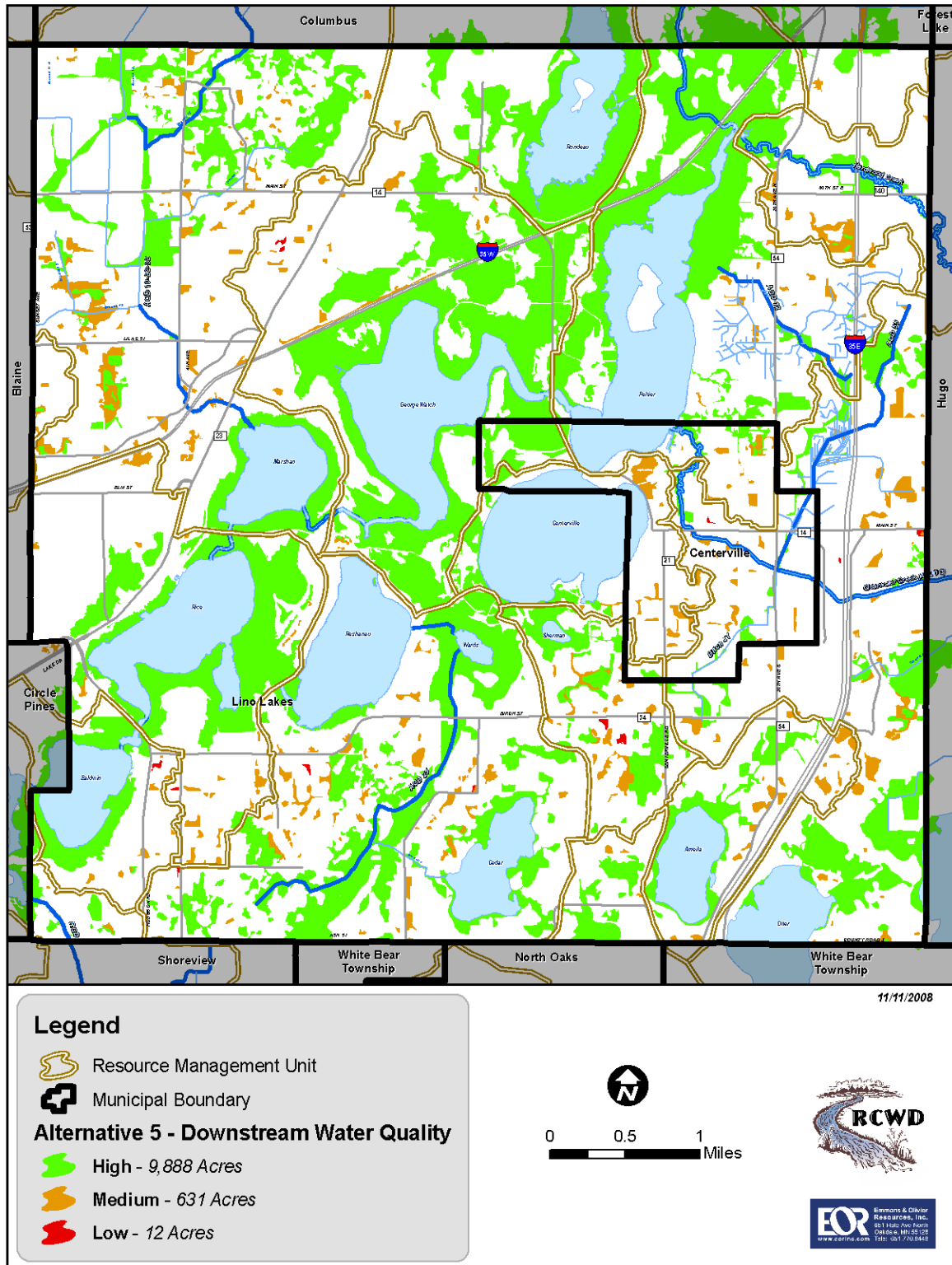


Figure A-1.2c. RMP Alternative Downstream Water Quality Protection Function

City of Lino Lakes Special Area Management Plan (SAMP)

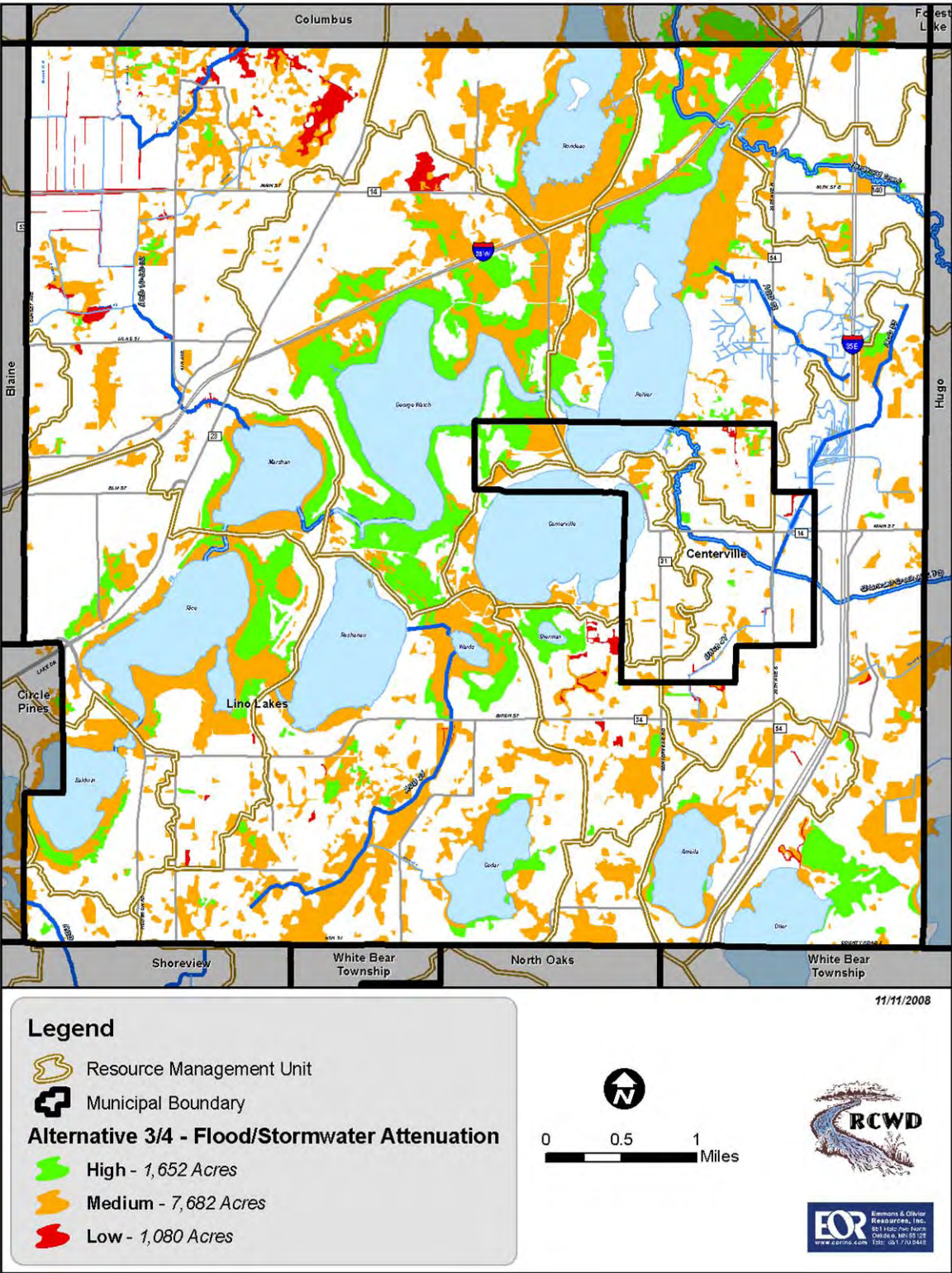


Figure A-1.3b. Alternative 3+4 Flood/Stormwater Attenuation Function

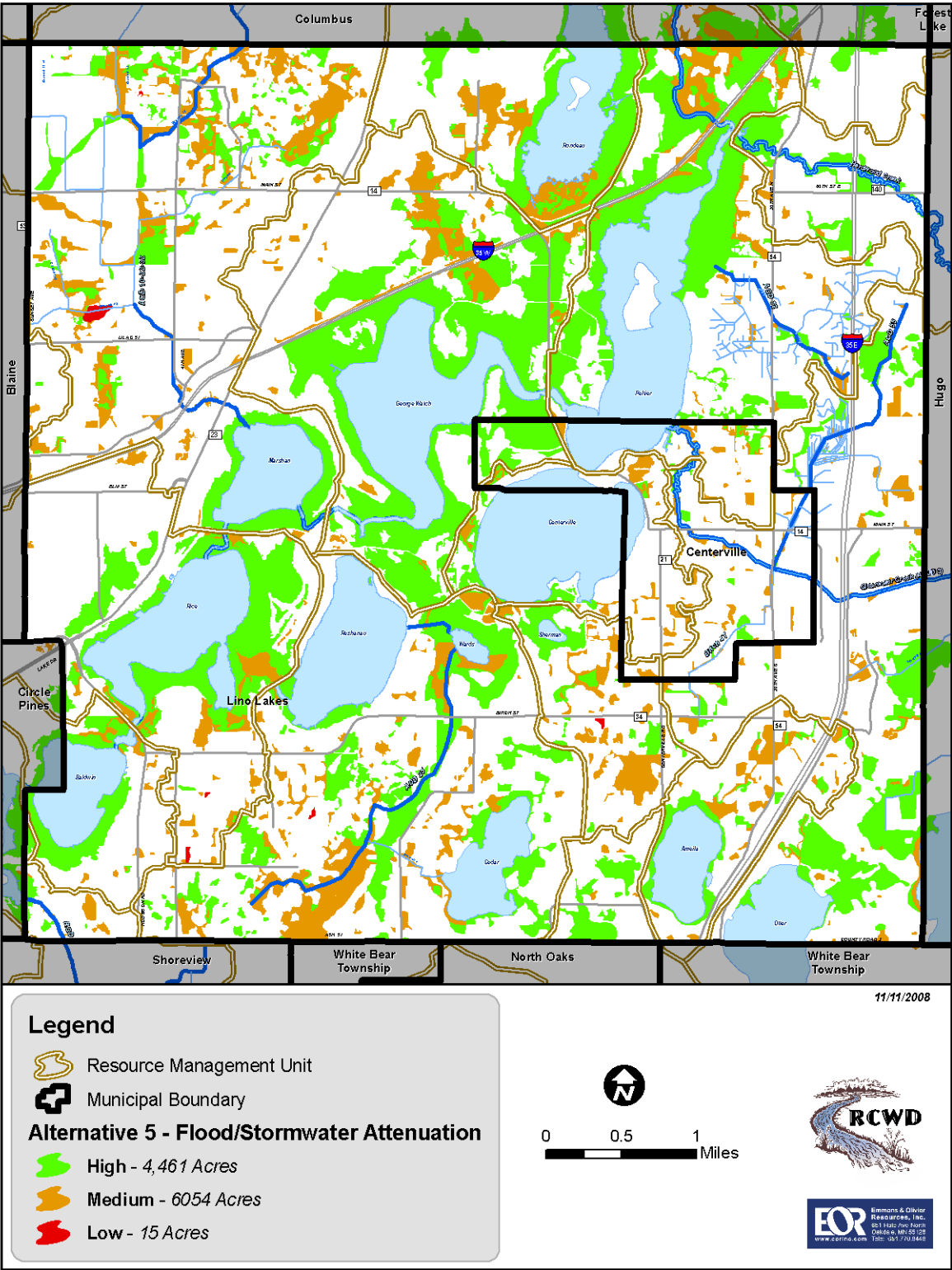


Figure A-1.3c. RMP Alternative Flood/Stormwater Attenuation Function

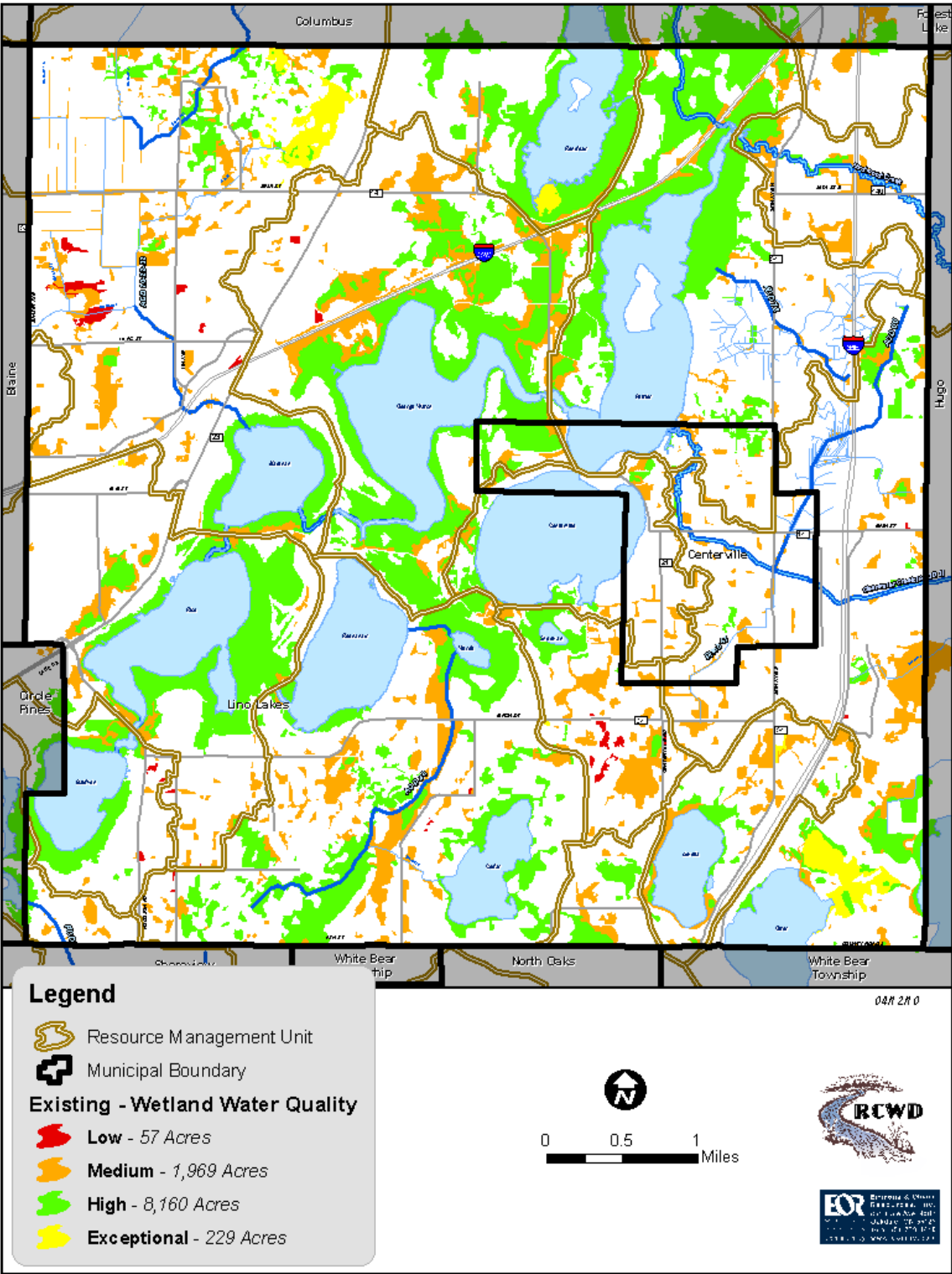


Figure A-1.4a. Existing Conditions Wetland Water Quality Function



City of Lino Lakes Special Area Management Plan (SAMP)

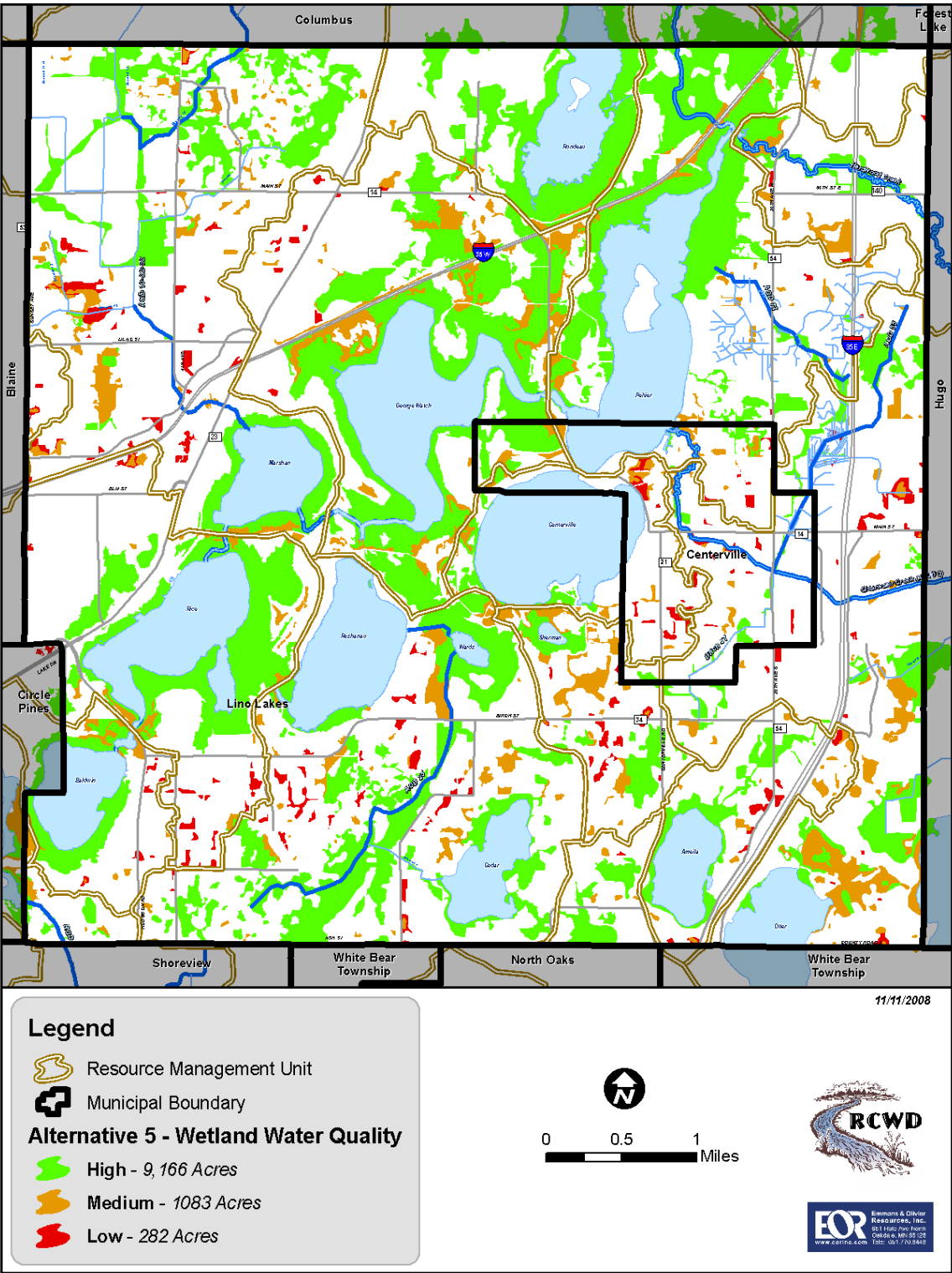


Figure A-1.4c. RMP Alternative Water Quality Function

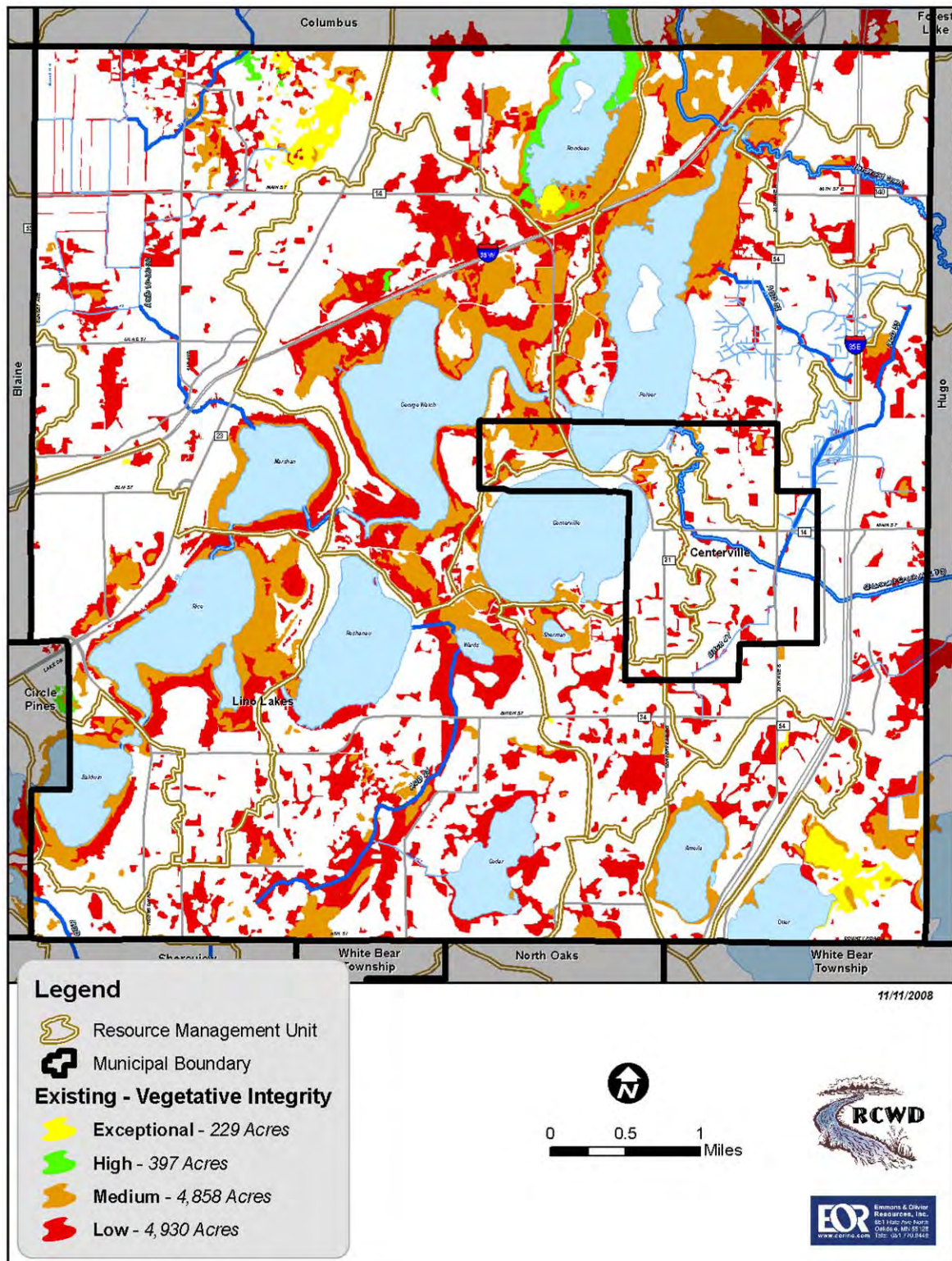


Figure A-1.5a. Existing Conditions Vegetative Integrity Function

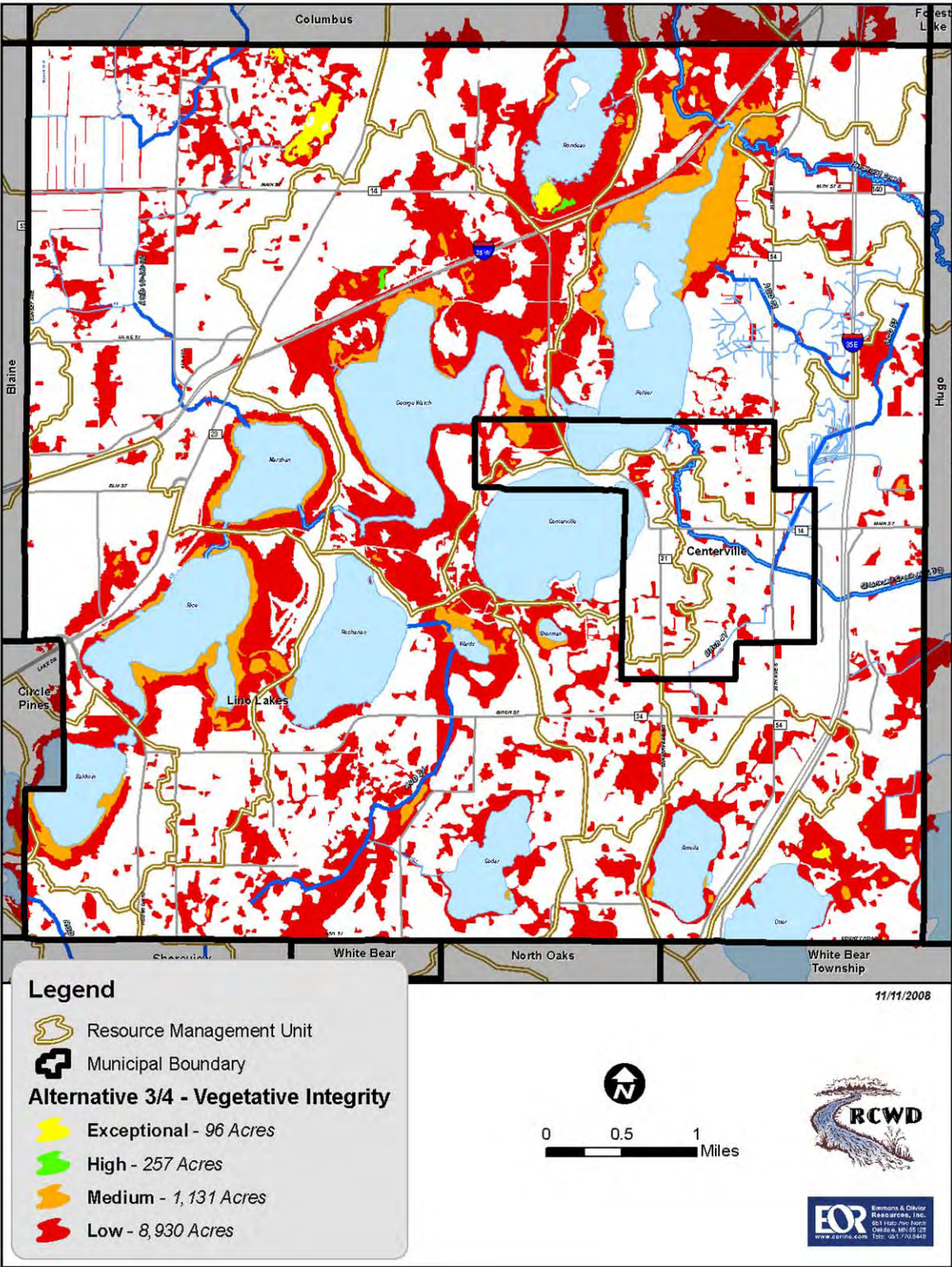


Figure A-1.5b. Alternative 3+4 Vegetative Integrity Function

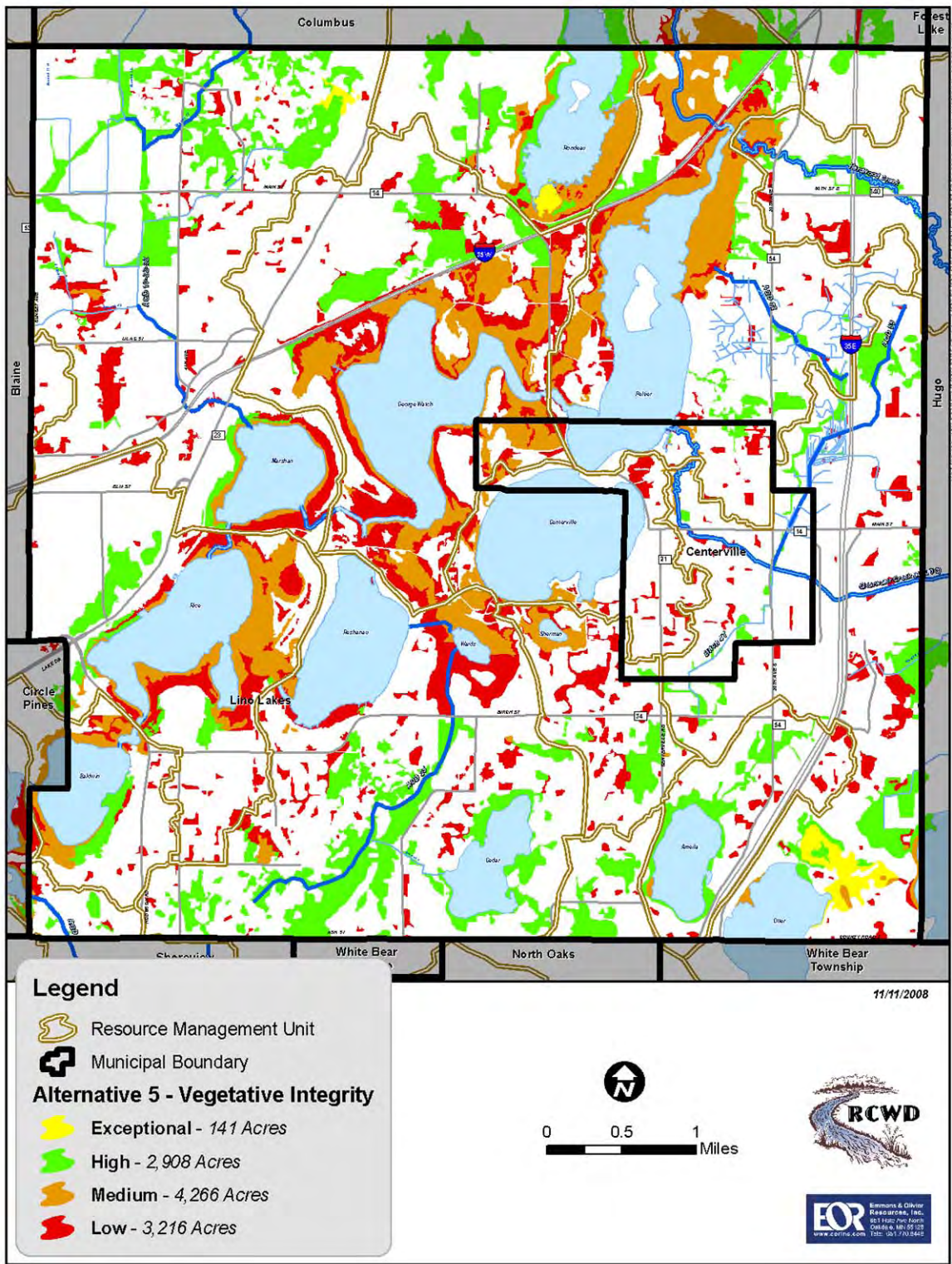


Figure A-1.5c. RMP Alternative Vegetative Integrity Function

PAA APPENDIX 2: CITY-SCALE WETLAND FUNCTION DIFFERENCES BETWEEN LAND USE ALTERNATIVES

Functional assessment results are from the RMP Report. Methodology is described therein. Provided here are brief explanations of each function and factors that may contribute to a city-scale shift in functioning from one land use alternative to another.

The hydrologic regime function differences in Figure A-2.1 reflect changes in the degree of intervention or disturbance in the natural water level fluctuations within the wetland or immediate watershed. Such disturbances include presence of water level or outlet control structures that prevent natural seasonal fluctuations. In Lino Lakes, a reduction in functionality primarily reflects the increase in watershed runoff from lack of volume reduction standards. Reduction in maintenance of hydrologic regime functionality is coupled to reduced vegetative integrity and water quality.

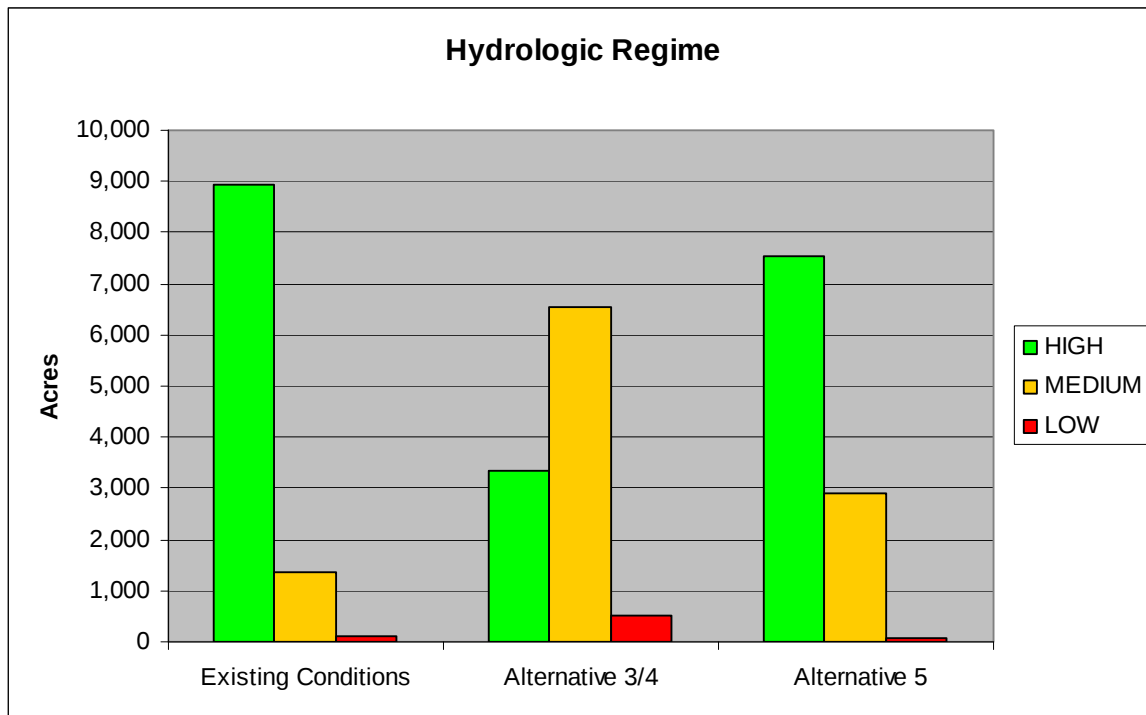


Figure A-2.1. Differences in Wetland Hydrologic Regime Functioning Between Lino Lakes Land Use Alternatives

Maintaining the water quality of wetlands is driven by the ability of the wetland to sustain its characteristics. Reduction in functionality indicates that surrounding upland land use, buffers, and stormwater nutrient loading are negatively impacting the ability of wetland function to be sustained. As seen in Figure A-2.2, the RMP Rule standards and RMP Land Use Alternative have the effect of mitigating a potentially significant decline in overall wetland water quality.

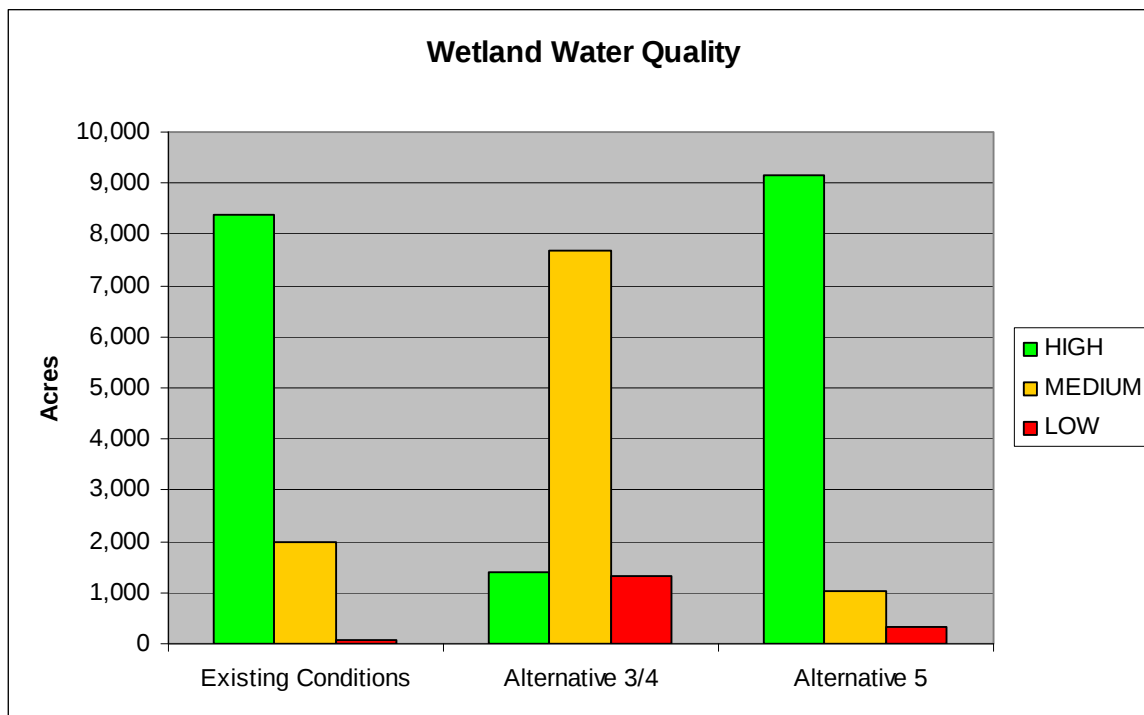


Figure A-2.2. Differences in Wetland Water Quality Functioning Between Lino Lakes Land Use Alternatives

Flood and stormwater attenuation is a function that reflects watershed runoff characteristics, as well as quality of runoff and watershed wetland density. The measureable changes to functionality shown in Figure A-2.3 mainly reflect runoff quality and quantity and upland land use changes, but not so much wetland density.

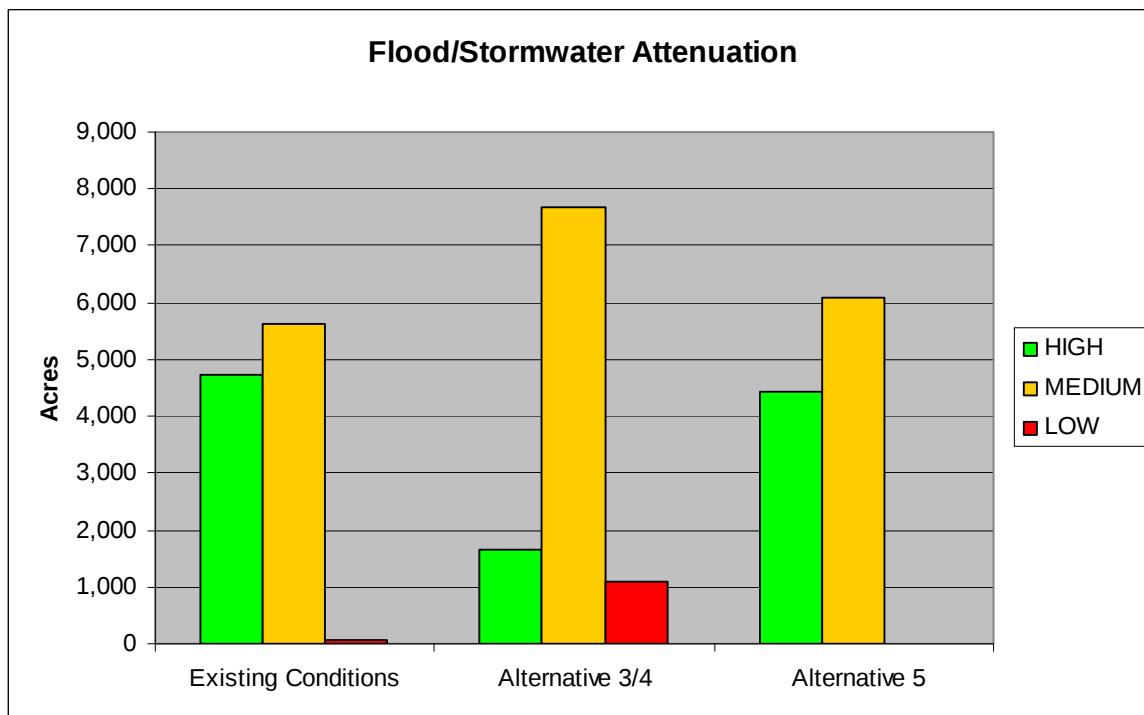


Figure A-2.3. Differences in Wetland Flood/Stormwater Functioning Between Lino Lakes Land Use Alternatives

In evaluating the protection of downstream water quality function, the wetlands are examined for their position upstream of valuable resources such as lakes and rivers. In comparing the three alternatives in Figure A-2.4, it is important to note that the reduction in functionality from Existing Conditions to Alternative 3 and 4 is attributable to factors in the watershed that change between the land use alternatives. These factors include indicators of the ability of wetlands to remove sediment and nutrients that can affect downstream water quality. The reduction indicates that as a whole in Lino Lakes, the ability of wetlands to protect downstream resources may decline with Alternative 3 and 4, but would essentially be maintained in the RMP Alternative.

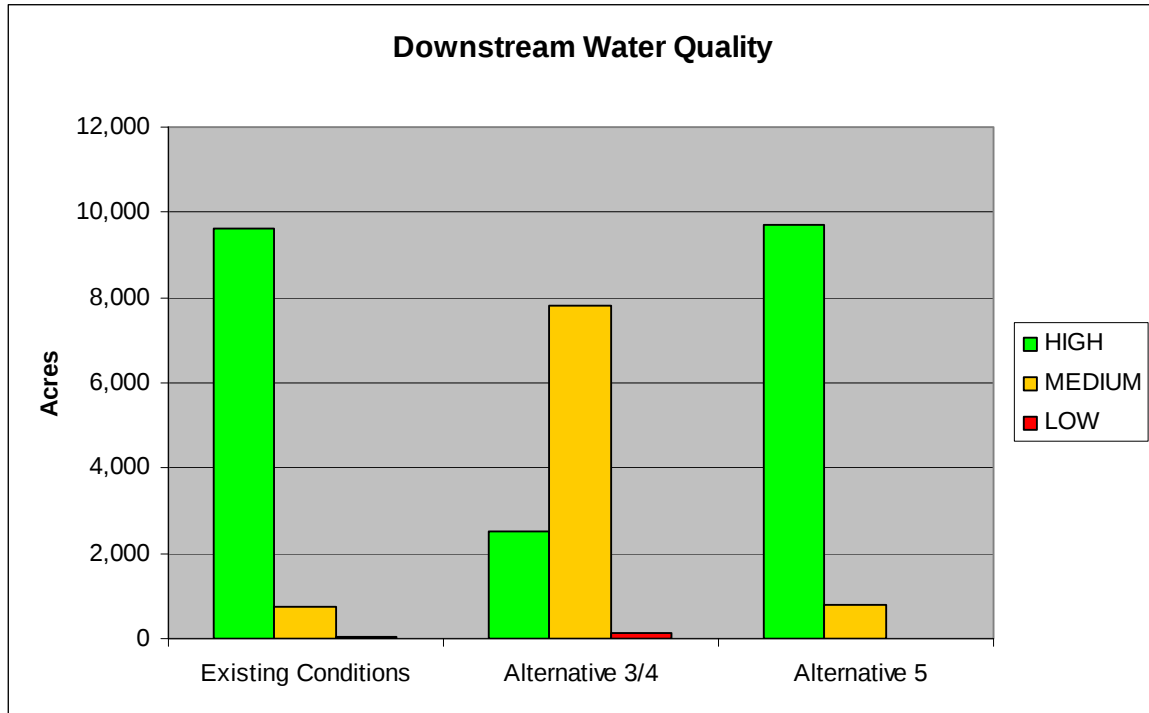


Figure A-2.4. Differences in Wetland Downstream Water Quality Functioning Between Lino Lakes Land Use Alternatives

The levels of vegetative integrity shown in Figure A-2.5 reflect the diversity of vegetation for all wetland types in Lino Lakes. There is a very low population of exceptional acres and these are in areas not susceptible to direct development. The higher proportion of 'high' integrity acres reflects the RMP Rule standards for restoring a diverse assemblage of native wetland species to wetlands in the Wetland Preservation Corridor areas.

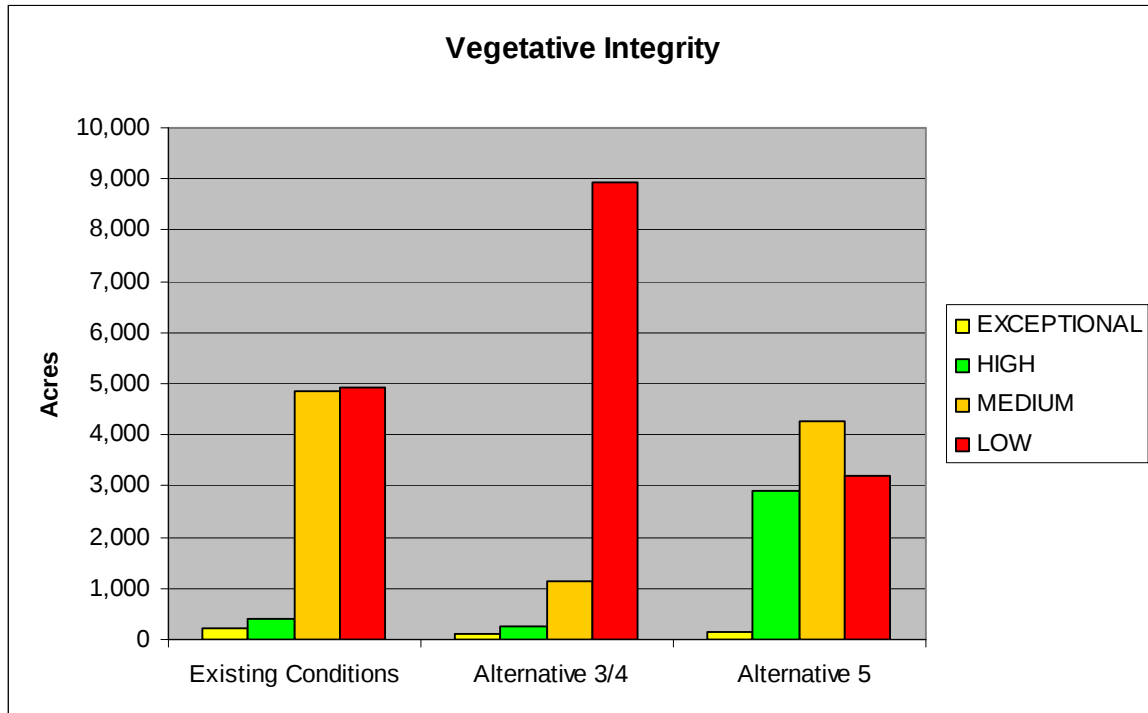


Figure A-2.5. Differences in Wetland Vegetative Integrity Functioning Between Lino Lakes Land Use Alternatives

IMPACT AVOIDANCE AND MITIGATION GUIDELINES

Wetland Impact Avoidance

The term wetland impact shall, for purposes of the SAMP, mean ‘a loss in the quantity, quality, or biological diversity of a wetland caused by draining, filling, excavating, or diverting water from a wetland,’ or conversion by inundation or other means of an existing high functioning wetland type to some other type with lower functionality. Conversion of a wetland type is generally viewed under Corps policy as a wetland impact.

Interagency Decisions in Sequencing

This SAMP provides information for alternatives analysis that is undertaken to avoid, minimize, and mitigate impacts to wetlands associated with proposed projects. Project applicants must have a pre-application meeting with the RCWD, WCA TEP and Corps prior to making alternative decisions on parcel selection for a proposed action. At the pre-application meeting the applicant will be provided information used to formulate the SAMP, such as the MLCCS land cover data, landscape level WPC, and recommendations on alternative locations.

The Wetland Permitting Process provides steps that distinguish between conceptual planning alternatives analysis and detailed design alternatives analysis. Under the SAMP, conceptual planning analysis is recommended prior to detailed design analysis. This distinction from existing state and federal rules can provide significant cost savings to project applicants whose concept planning requires revision in order to fully address avoidance of wetland impacts. The project applicant should submit the concept plan for review and comment on alternatives to avoid impacts. The Wetland Permitting Procedures detail the information required for different stages of alternatives analysis.

During the process of avoiding, minimizing, and compensating for impacts, the priority for avoidance of impacts is related to the watershed location, quality, and functionality of the resource. The priority for avoidance can be broken into three categories:

- 1.) WPC wetlands;
- 2.) Critical upland wooded habitat contiguous with wooded wetlands (MLCCS map units for upland natural community or state-listed animals are known to use both the wetland and upland). Critical Upland Habitat includes the upland areas immediately adjacent to wetlands that are necessary to fulfill the habitat function of the wetland; and finally
- 3.) Non-WPC wetlands.

Categories 1 & 2 trigger additional incentive to more fully explore alternatives analysis, otherwise higher replacement ratios can be anticipated. The priority for avoidance given above does not loosen alternatives analysis for category 3. As far as replacement goes, category 3 will receive scrutiny as described in existing state and federal rules. Category 1 impacts trigger higher replacement ratios if compensatory replacement for losses to these resources is being considered. Category 2 impacts will trigger a functional loss for which there is no mechanism requiring replacement at this time. However, as discussed under Volume Banking, critical upland wooded habitat is an excellent choice for meeting part of the onsite volume credit requirement, which would also preserve Category 2 wetland habitat.

The wetland permitting procedures outlined later in this SAMP detail the information required by applicants at different stages of alternatives analysis and development of compensatory replacement plans. If the compensatory replacement requirements are not met for the applicant's preferred onsite alternative, then the applicant will be required to redesign the project or consider purchasing wetland credits.

The permitting procedures are detailed in an 8-step process. The final WPC will be determined during Step 2 or 3, when the field wetland delineation is submitted and approval is granted.

Step 1: Data Collection for Offsite Alternatives Analysis

Step 2: Onsite Alternatives Review

Step 3: Preliminary Design Review

Step 4: Applicant Development Design

Step 5: WCA and CWA Permit Review

Step 6: Construction

Step 7: Post-Construction

Step 8: Post-planting Monitoring and Management

Spotlight in the Rule: Permit Process - APPLICABILITY

- (a) A Rule RMP-3 permit is required to:
 - (i) Fill or excavate in or drain, wholly or partially, a wetland within the RMP area;
 - (ii) Create more than 10,000 square feet of impervious surface within the RMP area; or
 - (iii) Use motorized equipment to alter land contours within the RMP area so as to increase or decrease the rate or volume of surface runoff into a wetland within the RMP area.
- (b) For activity subject to this Rule, a separate permit under District Rule B (Procedural Requirements), C (Stormwater Management) or F (Wetland Alteration) is not required. Other District Rules including Rule I (Drainage Systems) and the permit requirements of other units of government, including the U.S. Army Corps of Engineers, continue to apply.
- (c) Sections 5 and 6 below are not applicable, and submittal requirements will be modified accordingly, in an instance where the District is not the local government unit under Minnesota Statutes §103G.005, subdivision 10e, responsible for implementing the Wetland Conservation Act.
- (d) Public linear roadway projects not part of an industrial, commercial, institutional or residential development are partly excepted from this Rule as follows:
 - (i) Wetland impacts are subject to District Rule F rather than sections 4 through 7 of this Rule for the following classifications per MnDOT State Aid Manual Chapter Zero—General Information: Rural Principal Arterials, Rural Minor Arterials, Rural Major Collectors, Urban Principal Arterials, Urban Minor Arterials, Rural Minor Collectors and Urban Collectors.
 - (ii) Stormwater quality and infiltration requirements of Rule C, subsection 5(f), apply in place of subsections 8(b) and (c) of this Rule.

Step 1: Data Collection for Off-site Alternatives Analysis

Potential applicants are advised to contact the RCWD and Corps to obtain existing data on wetlands and other natural resources, the location of all high priority resources in the SAMP area, fact sheets on low impact development design, and any other information which may be beneficial to early offsite and conceptual planning alternatives development. In addition, a request to the Corps should be made for a jurisdictional determination. Potential applicants are strongly encouraged to consider alternative properties for the proposed action prior to making the property decision. Applicants must also satisfy Corps requirements for off-site alternatives analysis. During final permit review, project purpose and need and discussion of at least two off-site alternatives will be required. Proposals will need to demonstrate that the selected alternative is the least environmentally damaging alternative. Off-site analysis should include a review of zoning requirements and feasibility of providing variances to avoid impacts.

Verification of any ditches on all properties under consideration should be conducted at this time. Private ditches within the area are assumed, at this point in the planning process, to be lawfully connected. For all private ditch maintenance, evidence must be provided to demonstrate that the ditch is lawfully connected to the public ditch.



Spotlight in the Rule: Permit Process -APPLICATION REVIEW

- (a) Pre-application Review: In cases where wetland fill, excavation or draining, wholly or partly, is contemplated, the applicant is encouraged to submit a preliminary concept plan for review with District staff, Technical Evaluation Panel and City of Lino Lakes before submitting a formal application. The following information will be examined during pre-application review:
 - (i) Sequencing (in accordance with State and Federal requirements, reducing the size, scope or density of the proposed action, and changing the type of project action to avoid and minimize wetland impacts);
 - (ii) Wetland Assessment*;
 - (iii) Applying 'Better Site Design' principles;
 - (iv) Integrating into the wetland buffer zone compatible uses such as pervious trails, volume credit activities, and Best Management Practices (BMPs) described in Section 8 of this Rule;
 - (v) Exploring development code flexibility, including conditional use permits, planned unit development, variances and code revisions;
 - (vi) Review specific strategies such as wetland stormwater susceptibility and corridor connections identified in the RMP for each affected RMU must be reviewed and addressed by the applicant; and
 - (vii) Coordinate WPC establishment with existing adjacent WPC's

The applicant will provide documentation sufficient to assess project alternatives at a concept level and such other information as the District specifically requests.

- (b) On receipt of a complete application, the District will review and act on the application in accordance with its procedural rules and in accordance with Wetland Conservation Act procedures.
- (c) Replacement plan, exemption, no-loss and boundary decisions under this Rule will be subject to appeal in accordance with the terms and procedures of the Wetland Conservation Act. Other elements of a District permit decision will be subject to appeal in accordance with the terms and procedures of Minnesota Statutes Chapter 103D.
- (d) On request, District staff will provide to an applicant a draft Engineer's Report regarding status of application completeness and review.

*Such as using the MnRAM current version or other TEP-approved method.

Step 2: On-site Alternatives Review

Applicants are strongly advised to undergo iterative conceptual plan review with the RCWD and Corps for preliminary designs that can avoid impacts to aquatic and high priority resources. Lino Lakes city staff will also be part of early concept plan review. Field wetland boundary delineation is not required in order to discuss the applicant's concept plans in Step 2, however if the applicant believes that there may be important differences between the SAMP wetland boundaries and field-determined wetland boundaries, then the latter data should be obtained. During this early coordination step, the RCWD may provide guidance to applicants on locations of high priority resources within or adjacent to the proposed project. Whether now or at Step 3, once there is an approved wetland delineation report the RCWD will make a determination on the final WPC and revise the planning WPC accordingly. The locations of resources will be provided by the RCWD to the applicant. The RCWD natural resource inventory (NRI) is quite complete; however, the boundaries do not substitute for the level of detail obtained from field delineation. The

conceptual plan review does not substitute for final plan review for permitting, should an applicant choose to submit a permit application under the SAMP and all other applicable wetland regulations.

Conceptual plan review will evaluate avoidance and minimization for all of the criteria listed below.

- Local coordination with respect to appropriate land use and zoning.
- Reduced scope of action
- Low impact development (LID) stormwater design
- Integrated architecture and stormwater plan
- Road circulation plan
- Road widths
- Landscaping design

No engineering plans are necessary during Step 2. A preliminary concept plan can be prepared that demonstrates which alternatives have been considered and which is the least environmentally damaging alternative. The applicant may request TEP review at this point. The TEP will review conceptual alternatives analysis if an applicant chooses to propose wetland impacts that must be mitigated through wetland permitting. Various alternative actions should be discussed, and changes to the preliminary concept plan should result in a more streamlined permit review if wetland impacts and replacement are proposed. At this point, changes to the concept may result in a plan without the potential to impact wetlands, and no replacement requirement.

The RCWD and Corps will review the concept plan for adequacy in avoiding wetland impacts by considering the above listed actions. If recommendations are made to modify any of the above actions, then the applicant will be urged to incorporate recommendations and resubmit the concept plan for review.

Step 3: Preliminary Design Review

This step shall only be initiated after the concept plan has been modified to demonstrate avoidance and minimization for all of the criteria listed in Step 2. At Step 3, potential applicants are required to provide the data listed below.

- Approved Wetland Delineation Report consistent with all applicable state and federal rules, as well as hydrologic monitoring data (if required) and plant community mapping and ranking consistent with the plant community key in MnRAM (current version) or other state approved model;
- Soil survey and borings;
- Updated private ditch survey, if applicable; and
- Threatened and endangered species survey, when requested by the RCWD.

The applicant shall use this information to revise the concept plan to further avoid and minimize impacts and may seek the recommendation of the RCWD. If applicants anticipate unavoidable impacts at this time, the permit will require complete description of at least two alternatives that avoid impacts, using the avoidance and minimization criteria in Step 2. If an application for a permit is prepared, this information will be used in any discussions with the watershed district and all relevant regulatory staff from state and federal agencies to make a determination on whether alternative actions have been fully considered.

Step 4: Applicant Development Design

Using the site-specific information and all earlier comments provided by the RCWD, TEP and the Corps, the applicant can create a site development plan in accordance with the RMP Rule and other applicable permitting requirements. The applicant shall prepare the following documents:

- Site development plan in accordance with the RMP Rule, including stormwater best management practices;
- Wetland functional assessment for existing and post project conditions for all wetlands on the site; Joint Project Notification (JPN) and replacement plan (compensatory mitigation plan);
- RCWD permit application; and
- Storm water Pollution Prevention Permit (SWPPP) application if applicable.

Step 5: WCA and CWA Permit Review

Once RCWD receives all required information, it will be sent to the TEP and Corps project manager and others required to receive a copy for review and comment. RCWD engineers will prepare an Engineer's Report and make a recommendation to the RCWD Board. The Board will consider all comments received from the TEP findings before acting on a permit, and the Corps will make a separate permit decision based on the conditions identified in the Lino Lakes Programmatic General Permit (Appendix C).

The review will itemize all required State and Federal permit standards and how the applicant is meeting those standards. Standards will follow Minnesota Rules 8420.0522 and the Federal mitigation rule, 33 CFR Parts 325 and 332, where not specified in the RMP-3 Rule.

Step 6: Replacement Site Construction

The applicant will implement the compensatory mitigation according to the approved permit. In addition to State and Federal rules for permit compliance at this step, following the receipt of all applicable permits, the applicant may schedule a meeting with the RCWD Inspector to review the replacement plan for establishing the replacement site elevations, hydrology and conserving on-site soil integrity, including all grading and vehicle haul road plans. Periodic inspection during construction by RCWD staff will be allowed by applicant.

Step 7: Post-Construction

Following completion of replacement site construction activities to establish hydrology and soil required to meet the vegetation to be established according to the permit, the applicant shall prepare an as-built elevation plan and data on hydrology and soil characteristics, using criteria from the Corps Wetland Delineation Manual and the Regional Supplement, for each separate water regime (per Cowardin wetland classification) encountered. This post-construction submittal of the as-built plan, hydrology, and soils data will require approval by the RCWD as suitable for establishing the wetland plant communities approved in the permit. The RCWD may determine that site hydrology and soil characteristics must be modified to meet the intended plant communities. Once hydrology and soil characteristics are approved, with applicable modifications, then vegetation establishment suitable to the approved water regimes and soils at the site will likely take place.

Step 8: Post-planting Monitoring and Management

If wetland impacts and replacement occurred on the site, the applicant shall submit annual Wetland Monitoring Reports for the WCA-specified period of five years or other timeframe specified in the permit. Each report will document the remediation and management activities undertaken to reach the standards established in the permits and quantitative data on exotic and invasive species management.

Watershed Runoff Management

The SAMP provides an approach for long-term maintenance of wetland functions to meet wetland regulatory requirements. It does this in large part by evaluating future runoff effects on wetland functions. The following discussion of runoff management will demonstrate how runoff and wetland functions are related and how the approach meets the needs of future land use and goals for impaired waters.

Urban runoff characteristics will be evaluated for impacts to wetlands as development plans are proposed. Volume and rate control standards are incorporated into the SAMP through Rule RMP-3.

Wetland Functions Related to Watershed Runoff

Watershed runoff that is heavily influenced by urban stormwater has the potential to negatively affect the following wetland functions:

- Maintenance of characteristic hydrologic regime
- Flood/stormwater attenuation
- Maintenance of downstream water quality
- Maintenance of wetland water quality
- Maintenance of wildlife habitat
- Interaction with groundwater

Under the SAMP, development proposals must demonstrate that implementation of local and regional stormwater treatment plans will not cause losses to hydrologic regime or wildlife habitat function of existing wetlands.

The SAMP is intended to provide better integration of the effects of watershed runoff on wetlands than current state and federal law. Except for direct discharge of stormwater pipes to wetlands, indirect impacts to wetlands affected by patterns of land development and urban runoff are not regulated under state and federal law. Under the SAMP, indicators influenced by watershed runoff characteristics can be regulated, including the extent of outflow control, imperviousness in the drainage area, wetland interspersions, and extent of sediment delivery from nonpoint sources.

Stormwater Sensitivity of Wetlands Varies With Hydrologic Unit

Wetland sensitivity to urban stormwater varies with wetland type. Runoff standards will be focused on the hydrologic regime of the most sensitive wetlands in each subwatershed catchment. The sorting of wetlands according to urban stormwater sensitivity (Stormwater Wetlands Advisory Group, SWAG) was performed to complement the hydrologic regime functional data. The watershed runoff management using the various BMPs described below will be geared towards maintaining the existing hydrologic functions.

Volume reduction strategies are intended to be compatible with requirements for meeting stormwater sensitivity of wetlands and maintenance of hydrologic function. The mix of BMPs to be incorporated into existing urban development (retrofits) or planned urban development will thus vary depending on the hydrologic unit and SWAG classification.

Wetland SWAG classification is not only related to volume of water but also nutrient content of the runoff. Urban stormwater typically has higher nutrient content than naturally filtered watershed runoff. The volume reduction strategies are considered to be effective in reducing the nutrient loading to wetlands. Nutrient impairment of wetlands is not as well understood as for lakes. Therefore, future data and standards may suggest other approaches for addressing stormwater sensitivity of wetlands with regard to nutrients.

Spotlight in the Rule: Stormwater Management

The following requirements apply to subdivision, grading or the creation of impervious surface subject to this Rule.

- (a) The requirements of District Rule C apply except for paragraphs 2(a) through 2(c) and 5(b) through 5(f) of that Rule.
- (b) Better Site Design principles will be adhered to and water quantity BMPs (as defined in this Rule) must be incorporated to the following standards:
 - (i) BMP volume must retain the one-year event by providing at least the volume equal to the runoff from a 2.3-inch, 24-hour storm over the tributary area within the site under proposed conditions.
 - (1) Infiltration BMPs (see District BMP standard plates and design criteria) are to be incorporated in areas with A & B hydrologic soil groups. Stormwater from impervious surfaces other than rooftops must be pretreated before discharge to infiltration BMPs, to remove sediment and floatables, or other materials that would restrict the BMP's capacity or contaminate ground water.
 - (2) In the following areas, the volume required by paragraph 8(b)(i) is to be provided by bio-filtration features or two-cell wetland treatment systems (see District standard plates and design criteria):
 - (a) Areas of C or D hydrologic soil groups that cannot be routed by a gravity system to onsite A or B hydrologic soil groups;
 - (b) Areas with a groundwater table within three (3) feet of surface, or otherwise at an elevation that poses a threat of groundwater contamination or renders the infiltration BMP ineffective;
 - (c) Areas where soil contamination is present or land use history indicates a likely threat of soil contamination.

- (c) In addition to the BMPs required under 8(b), volume control measures are required reducing runoff by at least the volume from 0.5-inches of rainfall over impervious surfaces on the site (0.5" multiplied by impervious area). Volume reduction required under this paragraph may be achieved only by the following measures: Reestablishment of Effectively Drained Wetlands and Floodplain Meadows Upland Restoration/Conservation, Restoration of Degraded Wetlands, Impervious Disconnection, Soil Amendments/Tilling.

Volume Reduction Measures	Volume Calculation
*Reestablishment of Effectively Drained Wetlands and Floodplain Meadows	1.0" x surface area (ac) for floodplain meadows and seasonally flooded, scrub shrub, and forested wetlands 0.5" x surface area (ac) for fully vegetated Type 2 and 3 wetlands
*Upland Restoration/Conservation	0.85" x surface area (ac)
*Restoration of Degraded Wetlands	0.25" x surface area (ac)
Impervious Disconnection	Up to 0.5" x disconnected impervious area (ac)
Soil Amendments/Tilling	0.3" x surface area amended (ac)

*BMPs eligible for Volume Bank Credits under Section 9.

- (d) The proposed activity may not reduce hydraulic efficiency of the drainage-ways within the RMP at any point upgradient of the applicant's parcel boundary.
- (e) The property owner must record a declaration, or a public owner execute a maintenance agreement, that prohibits plowed snow storage in a location from which runoff will be conveyed without adequate pretreatment (minimum of 25' overland drainage on grassland or other rough vegetated surface to trap flow) or sheet flow directly into a wetland within the RMP area. For Public Road Authorities conducting normal winter maintenance operations variance is provided for locations not feasible for using a snowmelt route that provides overland drainage and pretreatment.
- (f) Soil amendment, excavation or filling pursuant to development within the RMP area may not impede groundwater flow so as to create a substantial risk of loss of function to any wetland.

Best Management Practices for Sustainable Aquatic Resources

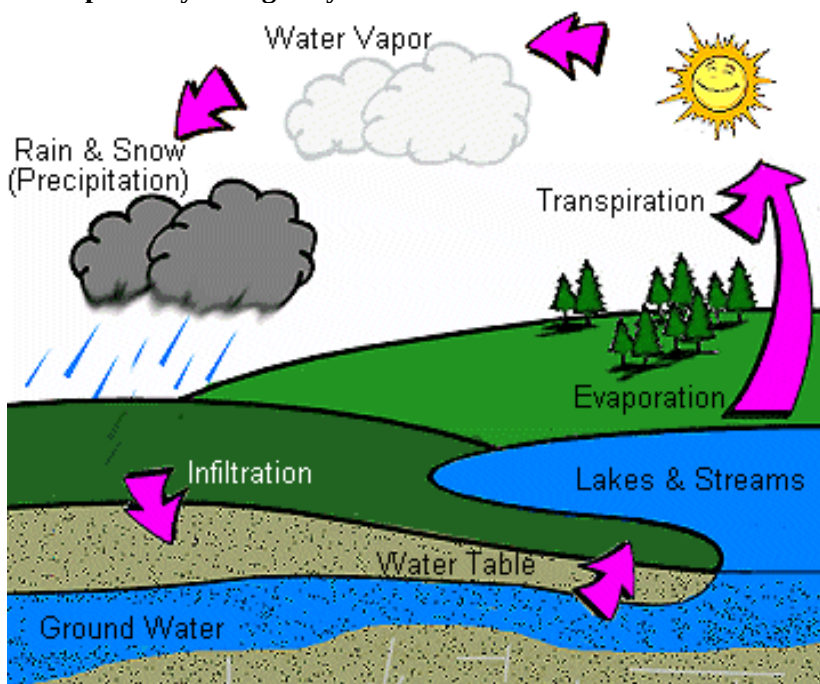
By far the biggest change to the hydrologic cycle in an urbanizing landscape is the surface water runoff. Prior to urbanization, precipitation would infiltrate into the ground. Because of impervious surfaces and piping typical in conventional development plans, the volume of runoff and the rate of runoff increase significantly over pre-developed conditions which have a greater capacity for stormwater infiltration. Conventional stormwater management is in direct conflict with aquatic resource management, because it is solely focused on moving increased runoff into aquatic resources as quickly as possible. Conventional stormwater practices utilize connected impervious roads and subsurface piping to quickly move water to downstream resources. The connected impervious network(s) (buildings, driveways, roads, and compacted turf areas with minimal or no infiltration) sometimes include a regional stormwater treatment pond to partially offset the negative impacts of the increased surface runoff.

Water from precipitation and groundwater seepage moves and cycles via:

- 1.) Evapotranspiration
- 2.) Temporary runoff storage
- 3.) Upland runoff surfaces
- 4.) Infiltration surfaces

A very simple hydrologic cycle shown below illustrates how water cycles between land and water surfaces. The idealized step between precipitation and infiltration includes not only infiltration surfaces, but also temporary runoff storage and upland runoff surfaces.

Conceptual Hydrologic Cycle.



Source: Wisconsin Department of Natural Resources.

www.dnr.state.wi.us/org/caer/ce/eeek/earth/groundwater/watercycle.htm

The SAMP provides the watershed-based analysis to develop sustainable BMP networks with disconnected impervious surfaces that are intended to increase temporary runoff storage, reduce impervious runoff surfaces, and increase infiltration surfaces. During urban land development, the BMP practices are to be integrated in a sustainable BMP network. Impervious and high runoff surfaces must be disconnected (to the extent feasible) in the network. Local areas of impervious surface (rooftops, driveways, high runoff turf, local streets, and highways) need to be disconnected from each other and networked with localized evapotranspiration, temporary storage, and infiltration sites. This avoids the large, regional volumes of runoff that are characteristic of conventional stormwater management and associated high impacts.

The proportion of each BMP is determined by the physical characteristics of the hydrologic sub-watershed being affected. Accepted runoff volumes shall be established based upon potential to increase evapotranspiration, increase temporary runoff storage, decrease upland runoff surfaces, and increase infiltration surfaces. The BMPs to be considered are listed below:

Evapotranspiration

- Biofiltration in wet meadows
- Grassland conversion from cropland

Temporary Storage

- Restoration of partially drained wetlands
- Green rooftops
- Rain barrels
- Neighborhood constructed ponds

Runoff Surface Volume and Rate Reduction

- Low Impact Development planning
- Disconnected impervious and high runoff surfaces

Infiltration

- Basins
- Front or back yard rain gardens
- Local street system rain gardens

The appropriate mix of BMPs considered for a particular project should be based upon site conditions and the volume management needed to avoid downstream aquatic resource impacts.

Cost comparisons are starting to be developed to evaluate different approaches to stormwater management. One of these comparisons examines an actual site in Dakota County, MN. A 220-acre development site in Lakeville was evaluated to determine the water and cost-related benefits that would have been if a conservation approach had been taken rather than a conventional approach.

Although the project had actually been completed under a conventional approach, a theoretical conservation alternative showed potential major reductions in runoff volume and substantial phosphorus load reductions for slightly less capital and annual maintenance costs. This approach treated the water system as an asset rather than an eyesore, thus becoming more of a neighborhood integrator than divider.

BMP Descriptions

The Minnesota Stormwater Manual (MPCA, 2005) and subsequent updates provide up-to-date guidance on vegetated BMPs to meet the multiple resource management goals. Appropriately located BMPs as part of a BMP network or ‘stormwater treatment train’, can maintain or even improve functions of existing wetlands.

Volume and Impervious Reduction

Through the RMP Rule-3, the SAMP will provide overall volume standards. The standards can be met using a wide variety of measures. First, reducing the impervious area using LID site design will lower the volume basis for meeting the standard. Green roofs are included here.

Upland volume reduction measures are:

- BMP Infiltration Features
- BMP Biofiltration Features
- Buffers/Conservation/Restoration Areas
- Impervious Disconnection
- WPC Upland Greenway Connections

It is important to recognize that naturally vegetated areas around wetlands are eligible for volume reduction. Thus, good site design can accomplish some of the volume requirements and meet WPC buffer requirements at the same time.

For a description of these activities, please go to Chapter 11 of the Minnesota Storm water Manual, Applying Storm water Credits to Development Sites, <http://www.pca.state.mn.us/publications/wq-strm9-17.pdf>.

Volume Banking

A parcel which meets its volume reduction requirement and that has the appropriate site conditions can establish volume credit (see “Spotlight on the Rule”, page 82). Attention must still be paid to maintaining the integrity of natural features.

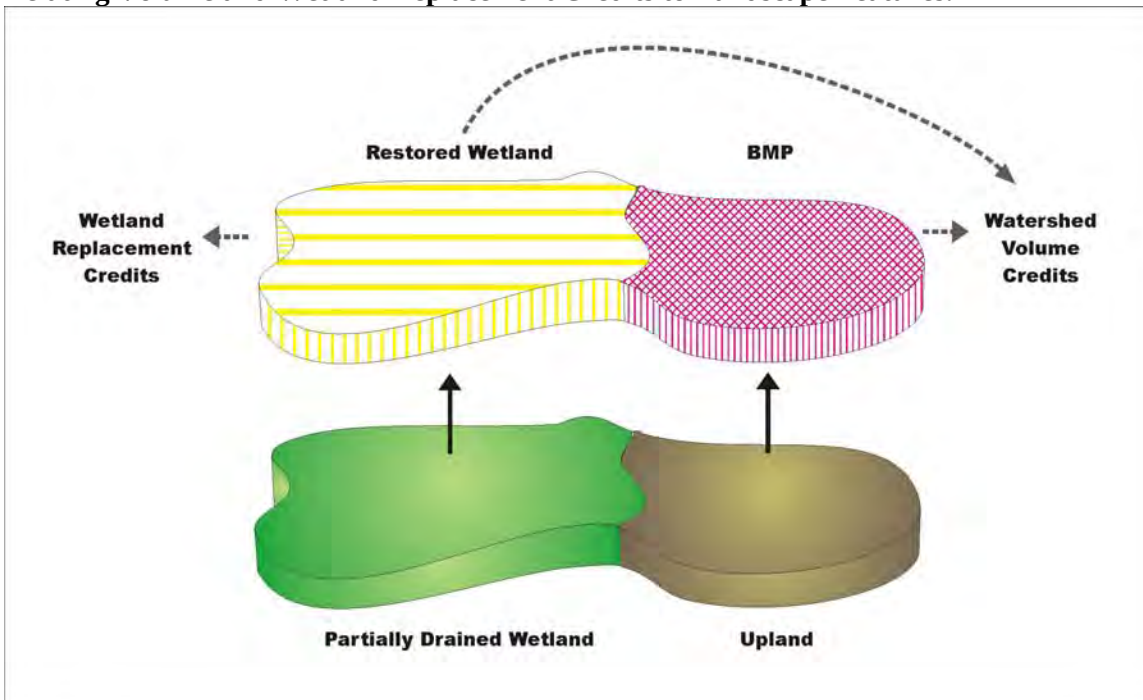
Allowable activities for banking are wetland re-establishment, restoration of partially drained wetland, and restoration of areas of degraded upland soils.

The bank will account for excess volume stored in eligible upland areas as well as wetland areas. Storage in wetlands will be allowed only to the extent that wetland functions are maintained for all of the wetland plant communities in a particular wetland complex. Only partially drained wetlands are eligible, and the characteristics of the restored wetland will be determined by wetland replacement permit/banking requirements. Once the wetland meets the wetland permitting standards, it is eligible for the volume bank. Banking requirements are codified in the RMP rule.

Volume credits generated may be used to offset increases in volume output only after all feasible BMPs for a particular development have been utilized. These credits may also be purchased and transferred within the watershed as long as the location may mitigate for the volume output from the development in question. Credit will be tracked and accounted for by the RCWD and will only be granted after assurance of success of the storage capacity of a constructed system can be verified.

A single restored wetland may be accounted for in two separate banks. The relationship of volume banking to wetland banking is illustrated below.

Relating Volume and Wetland Replacement Credits to Landscape Features.



Volume banking is not the same as nutrient banking. Nutrient credit trading has been applied to certain effluent discharge permits, and there is interest in its use for nonpoint source nutrient reduction requirements which may be required in the future. Wetlands have been discussed as a possible component, but, at present, knowledge gaps exist that prohibit this. In the future, when adequate data are available, the feasibility of developing nutrient banking may be considered.



Spotlight on the Rule: Volume Credits and Banking

An applicant may receive credit from the District for stormwater volume reduction measures that provide more attenuation than required under this Rule. The volume reduction measures must be included in the project design and the application must include a statement of intent to generate excess credits. Measures receiving credit will be protected in perpetuity by recorded covenants on a form approved by the District. Credits may be used to meet the requirements of paragraphs 8(a) and (b) of this Rule. The District will maintain credit and credit transaction records, but credit transactions will be arranged by the interested parties. For District purposes, a volume credit is the property of the owner of the land on which the credit was created and may be conveyed only to meet a present obligation under this Rule. The following will be used to determine credits for volume reduction measures:

- (a) Banked volume credits may be applied to meet volume control requirements elsewhere within the RMP-3 area. Volume credits created in excess of the requirement of paragraph 8(c) are bankable only for Reestablishment of Effectively Drained Wetlands and Floodplain Meadows, Upland Restoration/Conservation, and Restoration of Degraded Wetlands as listed under paragraph 8(c). The District will administer the accumulation and sale of credits, but the price for the credits will be established by negotiation between the interested parties. The District will require proof of purchase and will track debits and credits.

(b) Conditions for Volume Credits

The following restoration activities qualify for volume credits, pursuant to a design approved by the District:

- (i) Reestablishment of Effectively Drained Wetlands – Restoring hydrology and native vegetation to an effectively drained wetland.
 - (a) The wetland must be in hydric soils.
 - (b) The wetland area receiving credit must be fully vegetated. Credit will be given for the emergent vegetated part of a restored wetland based on the approved restoration plan design.
 - (c) Reestablished wetland area must be protected in perpetuity by means of recorded covenants.
 - (d) Soil excavation/alteration activity that results in a final surface elevation at or below the groundwater table is not eligible for credit.
 - (e) Wetland treatment systems required to meet paragraph 8(b)(i) do not qualify for this credit.
 - (f) Conservation easement is required over reestablished wetland area.
- (ii) Upland Restoration/Conservation - Conservation of high quality upland areas with a Natural Heritage ranking of “C” or better or restoration of Native Prairie, Woodlands or Forests.

Volume credit will be given only for area protected in perpetuity by recorded covenants in favor of the District.

Volume credit will be given only for area contiguous with a Wetland Preservation Corridor OR area of at least 0.5 acres not contiguous with the Wetland Preservation Corridor.

Volume credit will be given only for buffer area in excess of the minimum requirements of paragraph 7(c).

- (iii) Restoration of Degraded Wetland – Restoring hydrology and native vegetative cover to a partially drained wetland.

No excavation is permitted; limited scraping is allowed.

No credit will be given for open water wetland.

Wetland treatment systems required to meet paragraph 8(b)(i) do not qualify for this credit.

- (iv) Impervious Disconnection – Spreading of runoff from small parking lots, courtyards, driveways, sidewalks and other impervious surfaces into adjacent pervious areas where it is filtered or infiltrated to promote volume reduction.
 - (a) The contributing flow path from impervious cover must not exceed 75 feet.
 - (b) In all cases, the disconnection length must exceed the contributing flow path.
 - (c) Pervious area used for disconnection must have a slope no greater than five percent.
 - (d) The total surface impervious area contributing to a single discharge point shall not exceed 1,000 ft² and shall drain continuously through a pervious filter strip until it reaches the property line or drainage swale.
 - (e) Soil tilling to restore infiltration potential is required to restore porosity in graded/disturbed areas that will contribute to runoff connection length.
 - (v) Impervious disconnection and credit values must comply with District standard plates and design criteria.
 - (vi) Soil Compaction Mitigation – Upland areas protected from grading during construction, tilling of permeable soils compacted during construction, or amending and tilling of low-permeability soils compacted during construction.
 - (a) This credit may be combined with the impervious disconnection credit.
 - (b) Soil Compaction Mitigation must comply with District standard plates and design criteria.
 - (c) The District must be contacted 48-hours prior to soil compaction mitigation activities for verification of compliance.

Wetland Replacement

Replacement Ratios

After sequencing analysis, unavoidable impacts will require replacement using the designated replacement ratios shown in Table 9. The ratios were set using replacement risk, degradation, and location. Each wetland plant community in a wetland complex is calculated separately. The site-specific functional assessment will be used to evaluate degradation.

In-advance replacement is assumed in the replacement ratios of Table 8. Minnesota Rule 8420.0522 subpart 8 will be the criteria for in-advance replacement. A project-specific ratio modified from those shown here may be required for applicants not proposing in-advance replacement.

Risk of Replacement

The range of replacement ratios is plant community based and related to the establishment risk. Certain wetland types are difficult or not feasible to create or restore and take a long time to reach full functional potential. Each of the wetland types identified by Eggers and Reed (1987) has been ranked by degree of difficulty to create or restore based upon hydrologic classification and ability to reach full establishment within the regulatory timeframe (typically 5-years). There will always be establishment, and it should not be assumed that the lowest plant community based replacement ratios are risk-free. The ratios are what seem practicable in advancing existing rules at this time.

Hardwood swamps, tamarack swamp, and rich fen are included, but it is highly unlikely that establishment will succeed, and replacement plans for these would likely not be approved. Bogs and calcareous fens are not shown below because no successful creation of these wetland types has been demonstrated.

Table 7. Wetland Plant Communities Ordered by Establishment (Creation) Risk

Seasonal mudflat (less risk) – seasonally flooded basin
Mixed emergent marsh, semi-permanent hydrology – deep marsh or open water
Mixed emergent marsh, seasonal hydrology – shallow marsh
Wet meadow
Wet prairie
Sedge meadow
Shrub-carr (or alder thicket)
Lowland hardwood forest and floodplain forest
Hardwood swamp, seepage subtype
Hardwood swamp, ephemeral woodland inclusion
Tamarack swamp
Rich fen (highest risk)

The list is ordered from low to high risk.

Degradation and Location

Wetland location provides for variation in replacement ratios. Another variable is whether the impacted wetland is degraded or non-degraded. A scale of degradation has been developed to classify wetlands as degraded or non-degraded. Degradation ranges from severe to moderate and non-degraded from marginal to none.

Table 8. Scale for Evaluating Degradation Status of Wetlands

MnRAM Indicator Question (outlet condition/vegetative integrity)	Scale of Degradation
L/L or M/L	Severe
L/M or M/M	Moderate
L/H or H/L	Marginal
M/H or H/M or H/H	None

The site-specific wetland functional assessment will be considered in establishing the final replacement ratio by plant community. The TEP and Corps will also consider other site-specific wetland functions evaluated in the applicant's functional assessment before establishing the final replacement ratio. The level of degradation is to be determined and approved at Step 2 of **Wetland Permitting Procedures**.

Wetland Replacement Credits

In-kind Replacement

Replacement of impacts shall be in-kind, except if the site conditions allow for restoring a rare or less common community. In-kind replacement is defined as impact and replacement wetland plant communities being the same. Existing wetland rules do not typically consider the overall wetland diversity of the watershed in determining in-kind. The replacement planning may consider increasing wetland diversity when feasible.

Table 9. Wetland Impact Ratios

Wetland Plant Community Type	Location	
	Outside initial WPC	Within initial WPC
<i>Degraded*</i> shallow, deep marshes or open water	1:1	2:1
<i>Non-Degraded</i> shallow, deep marshes or open water	1.25:1	2.25:1
<i>Degraded*</i> sedge meadow, wet meadow, or wet to mesic prairie	1:1	2:1
<i>Non-Degraded</i> sedge meadow, wet meadow, or wet to mesic prairie	1.5:1	2.5:1
<i>Degraded*</i> shrub carr or alder thicket	1:1	2:1
<i>Non-Degraded</i> shrub carr or alder thicket	1.5:1	2.5:1
<i>Degraded*</i> hardwood, coniferous swamp, floodplain forest, or bog	1.25:1	2.25:1
<i>Non-Degraded</i> hardwood, coniferous swamp, floodplain forest, or bog	2:1	3:1
<i>Degraded*</i> seasonally flooded basin	1:1	2:1
<i>Non-Degraded</i> seasonally flooded basin	1.25:1	2.25:1

* As defined by marginally, moderately & severely degraded.

Primary Replacement

Primary Replacement activities create and restore wetlands for in-kind replacement. Restoration of partially or fully drained wetlands is the simplest activity for replacement, and therefore is the priority for Primary Replacement of the first 1:1 area of impact. This is because drained hydric soils are plentiful in the landscape. Many existing wetlands are partially drained, providing replacement credit on a sliding scale. For example, four acres of marginally degraded and partially drained wetland will result in one acre of replacement credit (a 25% replacement value in the WPC). The primary replacement can be a combination of activities.

Secondary Replacement

Secondary Replacement includes activities that are intended to increase the functional capacity of the in-kind replacement wetland or protect threatened wetlands. The area of functional replacement varies with the replacement ratio. For example, in order to meet the 3:1 impact ratio of 1 acre of impacted nondegraded hardwood swamp within the initial WPC (see Table 9), 1 acre of hardwood swamp would meet primary replacement credit and 2 acres of secondary replacement credits would meet the remaining requirements (see Table 10).

Table 10. Replacement Credit

1. Primary Replacement Credits For all replacement meeting the minimum 1:1	Within final WPC	Outside final WPC
Hydrologic and vegetative restoration of partially drained <u>marginally</u> degraded wetlands	25%	12.5%
Hydrologic and vegetative restoration of partially drained <u>moderately</u> degraded wetlands	50%	25%
Hydrologic and vegetative restoration of partially drained <u>severely</u> degraded wetlands	75%	37%
Establishment (creation) in nonnative upland	75%	37%
Restoration of effectively drained, former wetland	100%	50%
Farmed wetlands (WCA guidance) vegetation restoration	100%	50%
2. Secondary Replacement Credits For all replacement obligations exceeding 1:1		
Upland buffer contiguous with wetland	25%	12.5%
Upland habitat area contiguous with final WPC wetland (2 ac. minimum)	100%	n/a
Vegetation restoration of existing invasive or exotic dominated wetland in the final WPC	100%	n/a
Preservation of high quality wetlands (under threat of degradation)	50%	25%
Preservation of wetlands having “exceptional natural resource values” (WCA guidance)	50%	25%



Spotlight on the Rule: Wetland Replacement

Any activity subject to this Rule that includes wetland impact is subject to this Section.

- (a) The RMP is incorporated into this Rule. The specific terms of this Rule will govern, but if a term of this Rule is susceptible to more than one interpretation, the interpretation that best carries out the intent and purposes of the RMP will be chosen.
- (b) The provisions of the Wetland Conservation Act, Minnesota Statutes: §§103G.221 through 103G.2372, and its implementing rules, Minnesota Rules 8420.0100 et seq., as amended, apply under this Rule except where this Rule provides otherwise. The exceptions contained in Minnesota Rules 8420.0420 are not applicable under this Rule, except as follows:
 - (i) The agricultural, wetland restoration, utilities, *de minimis* and wildlife habitat exemptions, Minnesota Rules 8420.0420, subparts 2, 5, 6, 8 and 9, are applicable.
 - (ii) The drainage exemption, Minnesota Rules 8420.0420, subpart 3, is applicable on a determination by the District that the applicant has demonstrated, through adequate hydrologic modeling, that the drainage activity will not change the hydrologic regime of an RMP-mapped high quality plant community type (see Figure 5 of the RMP document) within the boundary of a Wetland Preservation Corridor.
 - (iii) The Rule does not apply to incidental wetlands, Minnesota Rules 8420.0105 subpart 2(D), if the applicant can demonstrate, to the satisfaction of the local government unit, that the area was created in nonwetland areas solely by actions, the purpose of which was not to create the wetland.
- (c) Replacement plans will be evaluated and implemented in accordance with Minnesota Rules 8420.0330 and 8420.0500 through 8420.0544, except that the provisions of this Rule will apply in place of Minnesota Rules 8420.0522 subpart 1, 8420.0522 subpart 3, 8420.0522 subpart 7, 8420.0526, and 8420.0544. The District will use the methodology of Minnesota Rules 8420.0549, subpart 5, to determine wetland replacement requirements for partially drained wetlands.
- (d) An application will identify WPC boundaries under normal conditions on any properties on which permit activity will occur. The applicant's initial WPC delineation will adjust the landscape-scale WPC boundary shown on Figure 1 by applying the criteria of paragraph 2(v) at a site level. A map showing final WPC boundaries must be prepared and filed with the District. The map will reflect any change to the boundaries as a result of the permitted activity.
- (e) A replacement plan must provide at least one replacement credit for each wetland impact acre, as shown in Table 1*. A minimum of 1:1, must be identified as Primary Replacement Methods in Table 2*. The remainder may be Secondary Replacement Methods identified in Table 2*.
- (f) Acres of impact and replacement credits are determined by applying the following two steps in order:
 - (i) Multiplying actual acres affected by impacts by the ratios stated in Table 1*; and
 - (ii) Multiplying the replacement acres by the percentages stated in Table 2*. All areas used to calculate wetland replacement credit that are not within the final WPC will receive 50% credit, unless replacement is on the same parcel as impact and there is no initial WPC on the parcel, in which case the area will receive full credit for replacement activities.
- (g) The replacement plan must demonstrate that the proposed action will result in no net loss of wetland hydrologic regime, water quality, or wildlife habitat function through a wetland assessment method approved by BWSR pursuant to the Wetland Conservation Act, Minnesota Statutes §103G.221 et seq.

- (h) The location and type of wetland replacement will conform as closely as possible to the following standards:
- (i) No wetland plant community of high or exceptional wildlife habitat function and vegetative integrity, as identified in the required wetland assessment, may be disturbed.
- (ii) Replacement credit will not be given for excavation in an upland natural community with Natural Heritage Program rank A or B or equivalent quality or upland habitat areas in the final WPC.
- (iii) Upland of equal or lower quality than Natural Heritage Program rank B/C may be converted to wetland for replacement credit.
 - (i) A road, utility including manholes and lift stations, or other structure, other than a structure related to a passive recreational or educational use, may be placed within the final WPC only on compelling need and pursuant to the District's variance procedures.
 - (j) Unless a different standard is stated in the approved replacement or banking plan, the performance standard for upland and wetland restored or created to generate credit is the establishment, by the end of the WCA monitoring period, of a medium or high plant community ranking pursuant to the approved replacement plan and establishment of at least 50% of the total number of native species and 80% areal coverage proposed in the planting or seeding plan.
 - (k) A variance to a requirement of section 5 otherwise meeting the criteria of District Rule L may be granted if the Technical Evaluation Panel concurs that the wetland protection afforded will not be less than that resulting from application of the standard criteria of the Wetland Conservation Act.

*found in the Rule

Basic Stipulations on Replacement Wetland Plans

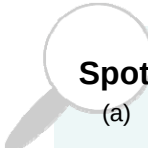
The proposed wetland credits for replacement activities in the Lino Lakes SAMP are an acre-based currency.

The following stipulations apply to selection of replacement sites:

- 1.) All high quality wetland plant communities (DNR Natural Heritage Rank B/C or higher) are protected and may not be disturbed.
- 2.) High quality upland (MLCCS-mapped natural community and with MNDNR Natural Heritage Rank B/C or higher) may not be used for the creation of new wetland credit.
- 3.) Effectively drained wetland (mapped hydric soil with no wetland) may be restored to wetland for credit at locations that increase the wetland community interspersion and decrease wildlife barriers (as scored using functional indicators for this that are approved by the TEP and Corps).
- 4.) Under certain circumstances upland associated with wetland may be included in the replacement plan for credit to meet ratios above 1:1. This is for natural community upland that ranks B/C or higher using MNDNR Natural Heritage descriptions. Replacement credit is allowed under the SAMP for preservation of this upland.
- 5.) Upland not dedicated to the WPC cannot be used for upland habitat credit in the replacement plan.
- 6.) Wetland delineation as well as a wetland functional assessment (using a method approved by the TEP and Corps if subject to CWA Section 404 permitting) is required for proposed action in the SAMP. Water level monitoring data may be required. Guidance on

requirements for water level monitoring and an acceptable protocol will be provided by the TEP.

- 7.) Actual acreages of wetland impact and wetland replacement ratios will be calculated using site-specific information and the methodology articulated in this SAMP.
- 8.) All wetland replacement for impacts must be replaced within the SAMP area. Replacement credits generated within the watershed may be used outside the watershed, if authorized by the BWSR for state banking and/or the Corps, as applicable.
- 9.) All maps and figures associated with this RMP are concept only. Actual final site conditions within the SAMP will depend on approved wetland delineations and detailed property information.
- 10.) An upland buffer (defined in the Rule) separating developed areas from final WPC wetlands will be required. The buffer area may include walking trails and limited stormwater BMPs if the landowner chooses and the proposal meets standards of the Rule.



Spotlight on the Rule: Vegetated Wetland Buffer

- (a) As a condition of permit issuance under this Rule, a property owner must record a declaration in a form approved by the District establishing vegetated buffer area adjacent to the delineated edge of wetland within the final Wetland Preservation Corridor and other approved wetland buffer area for the purpose of wetland habitat. The declaration must state that on further subdivision of the property, each subdivided lot of record shall meet the monumentation requirement of paragraph 7(b). On public land or right-of-way, in place of a recorded declaration, the public owner may execute a written maintenance agreement with the District. The agreement will state that if the land containing the buffer is conveyed to a private party, the seller must record a declaration for buffer maintenance in a form approved by the District.
- (b) Buffer is to be indicated by permanent, freestanding markers at the buffer upland edge, with a design and text approved by District staff in writing. A marker shall be placed at each lot line, with additional markers at an interval of no more than 200 feet. If a District permit is sought for a subdivision, the monumentation requirement will apply to each lot of record to be created. On public land or right-of-way, the monumentation requirement may be satisfied by the use of markers flush to the ground, breakaway markers of durable material, or a vegetation maintenance plan approved by District staff in writing.
- (c) All buffer required under section 7 must average at least 50 feet in width, measure at least 25 feet at all points, and meet the average width at all points of concentrated inflow. Buffer receiving secondary replacement credit as upland habitat area must be at least two acres in size.
- (d) The buffer or habitat area will consist of vegetated land, primarily plant species native to this region, that is not cultivated; cropped; pastured; mowed; fertilized; used as a site for depositing snow removed from roads, driveways or parking lots; subject to the placement of mulch or yard waste; or otherwise disturbed, except for periodic cutting or burning that promotes the health of the buffer, actions to address disease or invasive species, or other actions to maintain or improve buffer quality, each as approved in writing by District staff. The application must include a vegetation management plan for District approval. For public road authorities and stormwater system maintenance, the terms of this subsection will be modified as necessary to accommodate safety and maintenance feasibility needs.
- (e) Buffer may be disturbed to alter land contours or improve buffer function if the following criteria are met:
 - (i) An erosion control plan is submitted under which: alterations are designed and conducted to expose the smallest amount of disturbed ground for the shortest time possible; fill or excavated material is not placed to create an unstable slope; mulches or similar materials are used for temporary soil coverage; and permanent native vegetation is established as soon as possible.
 - (ii) Wooded buffer and native riparian canopy trees are left intact;
 - (iii) When disturbance is completed, sheet flow characteristics within the buffer are improved; average slope is no steeper than preexisting average slope or 5:1 (horizontal:vertical),

- whichever is less steep, preexisting slopes steeper than 5:1 containing dense native vegetation will not require regrading; the top 18 inches of the soil profile is not compacted, has a permeability at least equal to the permeability of the preexisting soil in an uncompacted state and has organic matter content of between five and 15 percent; and habitat diversity and riparian shading are maintained or improved.
- (iv) A re-vegetation plan is submitted specifying removal of invasive species and establishment of native vegetation suited to the location.
 - (v) A recorded declaration or, for a public entity, maintenance agreement is submitted that states that for three years after the site is stabilized, the property owner will correct erosion, maintain and replace vegetation, and remove invasive species to establish permanent vegetation according to the re-vegetation plan.
 - (vi) Disturbance is not likely to result in erosion, slope failure or a failure to establish vegetation due to existing or proposed slope, soil type, root structure or proposed construction methods.
- (f) No above- or below-ground structure or impervious surface may be placed within the buffer permanently or temporarily, except as follows:
 - (i) A structure may extend or be suspended above the buffer if the impact of any supports within the buffer is negligible, the design allows sufficient light to maintain the species shaded by the structure, and the structure does not otherwise interfere with the protection afforded by the buffer.
 - (ii) A public utility, or a structure associated with a public utility, may be located within a buffer on a demonstration that there is no reasonable alternative that avoids or reduces the proposed buffer intrusion. The utility or structure shall minimize the area of permanent vegetative disturbance.
 - (iii) Stormwater features that are vegetated consistent with 7(d) may be located within buffer on site-specific approval.
 - (iv) Buffer may enclose a linear surface no more than 10 feet in width for non-motorized travel if wetland habitat will not be measurably reduced. Trail edge mowing is not permitted.
 - (g) Material may not be excavated from or placed in a buffer, except for temporary placement of fill or excavated material pursuant to duly-permitted work in the associated wetland, or pursuant to paragraph 7(e) of this Rule.

Allowable Replacement Activities

Any flexibility or difference between the SAMP and WCA and 404 shall apply only for the geographic area of the SAMP. Flexibility for replacement activities in Table 9 is discussed below.

Upland Buffer and Habitat

It is important to point out the distinction being made between upland buffer and upland habitat area. The SAMP distinguishes buffer as natural vegetation area contiguous with wetland that separates the resource from urban and agricultural areas to lessen the impact that activities in those areas can have on the wetland. Upland buffer can be used for wetland replacement credit around an existing or replacement wetland, if the average width is 50 feet and no less than 25 feet in any area, and it is contiguous with the wetland edge. In contrast, upland habitat area consists of existing natural non-wetland habitat contiguous with an existing, restored, or created wetland. Upland habitat area can be considered for secondary replacement credit if it is shown to be critical for special concern, threatened, or endangered species; or is contiguous along the wetland edge for at least 300 feet and 300 feet or more wide.

Upland buffer replacement credit is calculated when a replacement plan is being designed. It is not the same as the WPC buffer. The WPC buffer is put in place around WPC wetland irrespective of impacts to other wetlands on a parcel. The WPC buffer is the transition zone from the edge of the WPC wetlands to the intensive upland land use (agricultural and urban and commercial structures). The width will vary according to the compatible land use activities.

Wetland Creation and Re-establishment

Credit for creating wetland from historically upland areas is strongly discouraged. In addition to being very expensive, upland conversion is unnecessary because of the vast supply of former, drained wetland area that can be restored.

A coarse filter or landscape scale assessment of potential wetland re-establishment areas was done by comparing hydric soil classification to the National Wetland Inventory (NWI). Potential restoration areas have hydric soil and are not classified as wetland. A coarse filter modification was run using the MLCCS wetland coverage, because this wetland mapping is more accurate.

The results show large areas with the potential for re-establishment of former wetland (effectively drained wetland/hydric soil). These areas could be considered for primary replacement credit (project-specific replacement plans and wetland banking). Areas shown in Figure 7 are not accurate for replacement plan design and serve only as a rough guide for potential areas.

Replacement Priority

The SAMP prioritizes the replacement activities that are allowable under the SAMP permit review. Replacement method prioritizing is intended to address RCWD existing goals for protection and restoration of its natural resources. Although these priorities are not mandatory, during early stages of the permit process the applicant will be advised to follow them.

The following Replacement Method Prioritizing approach is used by the RCWD:

- 1.) Hydrologic and vegetative restoration of completely drained or partially drained wetlands in WPC
- 2.) Hydrologic and vegetative restoration of completely drained or partially drained non-WPC wetlands
- 3.) Hydrologic and habitat function restoration activities that replace wetland volume storage and enhance wildlife and vegetative integrity functions.
- 4.) Native vegetation restoration, first for WPC and then non-WPC wetlands (allowed above 1:1 replacement ratio)
- 5.) Establishment of wetland on existing nonnative vegetated upland; located to enhance existing habitat, wetland or upland

Credit for Restorable Wetlands

For restoration of partially drained wetlands, the goal will be to restore the processes of seasonal flooding and nutrient cycling to the full extent of the wetland basin. The hydrologic regime goal for restoring the partially drained wetland will be guided by its location in a resource management unit. The feasibility for restoring these wetlands has been preliminarily evaluated, taking into consideration future conditions in the watershed. The future conditions hydrologic modeling was used to assess future runoff characteristics of each hydrologic subunit. The available runoff volumes would go towards biofiltration, temporary storage of runoff, and other vegetated BMPs, as well as restoring hydrologic regime of partially drained wetlands. Detailed design will require assessing quality and hydroperiod of water and features that allow restoring as much of a natural regime as possible. The applicant can propose the hydrologic regime goal, but review and approval by the RCWD with TEP and Corps input is required. The implementing rule contains and clarifies these requirements.

Final determination of the amount of credit for partially drained wetlands will be performed at the time of field wetland delineation and TEP/Corps review. In coordination with the TEP/Corps the extent of partial drainage will be determined using the scale of degradation (see above and Definitions) or other means approved by the TEP/Corps. Credits can be used to offset approved wetland impacts (provided those impacts have been avoided and minimized to the greatest extent practicable) for a proposed action, or sold to others within the SAMP area. As defined under RCWD Rule, landowners with large partially drained wetlands have the opportunity through wetland banking to establish credits and sell them directly to compensate for impacts. Alternatively, credits can be banked for demand by others. Proposals to establish credit for banking will have to be coordinated and approved by the BWSR and Corps banking programs. Existing wetlands with potential for restoration were identified using a number of variables in addition to the drained hydric soil areas. The outcome is shown as high, medium, or low potential for restoration (Figure 8).

Spotlight on the Rule: Wetland Banking

- (a) Replacement requirements under Section 5 of this Rule may be satisfied in whole or part by application of replacement credits generated off-site within the RMP-3 area, but not by credits generated outside of the RMP area.
- (b) The deposit of replacement credits created within the RMP-3 area for banking purposes and credit transactions for replacement will occur in accordance with Minnesota Rules 8420.0725 and 8420.0735. Credits generated within the RMP area may be used for replacement either within or outside of the RMP area except as provided in paragraph 6 (c).
- (i) The District will calculate the amount of credit in accordance with the standard terms of WCA. This measure of credit will appear in the BWSR wetland banking account.
- (ii) If a banking plan requests that credits generated qualify for replacement within the RMP-3 area, the District will also calculate the amount of credit in accordance with Section 5 of this rule. The District will record this measure of credit internally. The District will adjust this internal account if the BWSR account later is debited for replacement outside of the RMP-3 area. When credits are used for replacement within the RMP-3 area, the District will convert credits used into standard WCA credits so that the BWSR account is accurately debited.
- (iii) A banking plan may request that credits be calculated both ways so that credits are available for use both within and outside of the RMP area.
- (iv) The amount of Secondary Replacement Credit accepted for deposit or internal District crediting will not exceed the amount of Primary Replacement Credit accepted in the transaction.
- (c) Banked wetland replacement credits created outside of the RMP-3 area, but within the Peltier or Baldwin contributing drainage area, may be used to replace impacts within the RMP-3 area that lie within the same contributing drainage area. Replacement credits will be as credited under the banking plan. The applicant proposing to use credits under this paragraph must field verify at the time of application that the banked wetlands lie within the contributing drainage area.

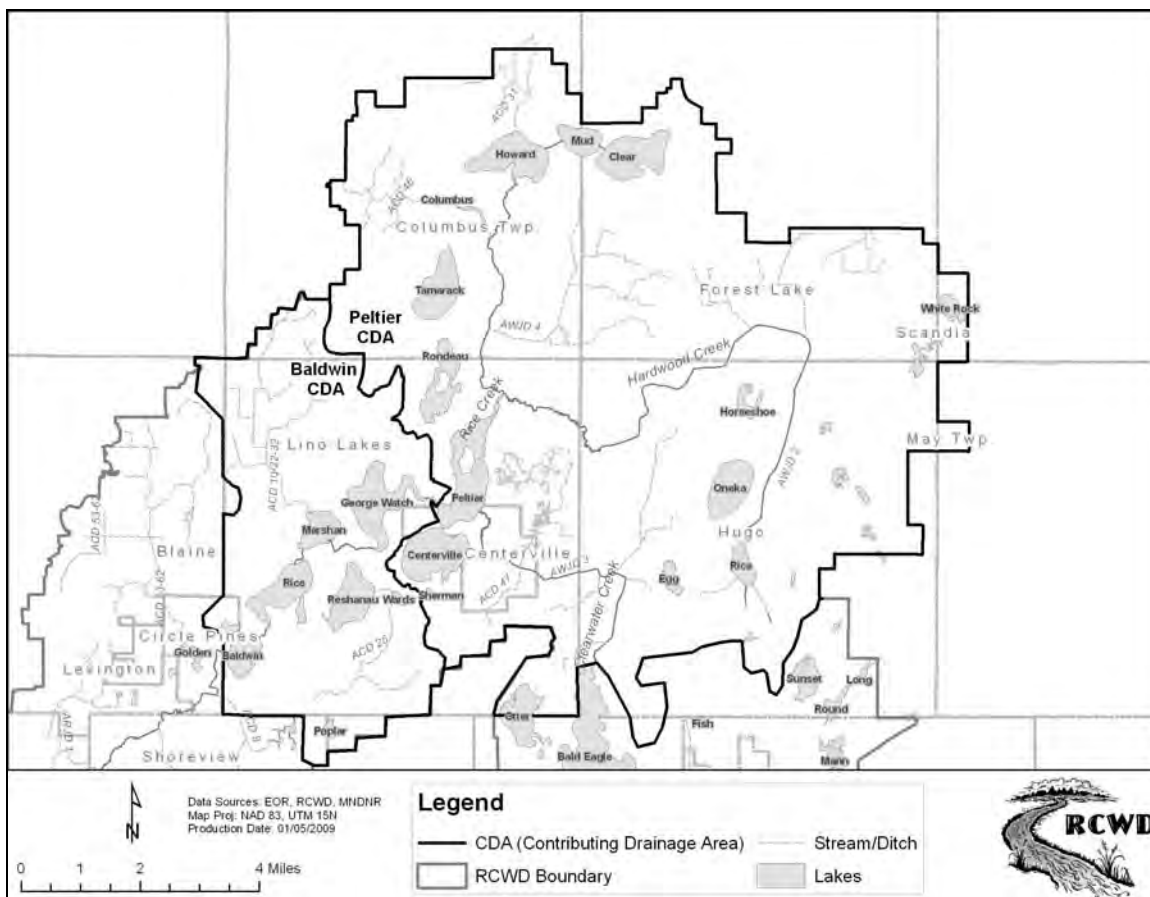


Figure 14. Contributing Drainage Areas to Lino Lakes

Wetland Banking

The RCWD will convert credits between RMP currency and BWSR currency, but will not administer any part of the state bank program under the WCA. The RCWD will administer trades wholly within the plan area but not for RMP credit to replace impacts outside the SAMP area. The bank will conform to MN Rule 8420.0700 and comply with parts 8420.0705 to 8420.0755. The Corps will also be involved in the wetland banking process. The following will be standards for any wetland bank transactions within the SAMP area:

- 1.) The credits generated within the SAMP area can be used to replace impacts outside of the SAMP. However, if credits are used outside of the SAMP area, 8420 concerning WCA will apply.
- 2.) Credits from outside of the SAMP area shall only be considered for replacement of impacts associated with projects governed by the RMP Rule if adequate credits are not available. In the case where credits are used from outside the SAMP area, the applicant must demonstrate adequate functional replacement.
- 3.) Applicants must first demonstrate that they are unable to replace wetland impacts within their own development area before utilizing available credits.
- 4.) Wetland banking credit locations become part of the WPC if not already located within the WPC.

Replacement Site Performance Standards

All compensatory wetland replacement activities within the SAMP area that are eligible for wetland credit are subject to performance standards. First, all areas identified on the replacement plan to be wetland must meet the three jurisdictional wetland criteria for hydrology, vegetation and soils as identified in the Corps Delineation Manual and Regional Supplement. In addition, each individual plant community proposed must be managed to meet or exceed the “high quality” standards specified for each distinct wetland plant community specified in the MnRAM current version, or as otherwise established under conditions of the wetland permit. This means that during the monitoring period all invasive and exotic species are managed, and all populations are treated to conform to the “high quality” standard.

All upland areas, including the buffer, in the WPC must be managed to reduce invasive and exotic species to the levels specified in the MLCCS for high quality plant communities. Standards of A or B, as specified in the MLCCS manual v 5.4 will be the goal for all natural upland communities. This will require initial removal of invasive or undesirable species, and a monitoring and maintenance plan to ensure target plant communities are attained.

Infiltration features proposed for functional replacement credit or as part of the volume standard established by rule, must also be consistent with design standards specified in the permit application. During the monitoring period, data will be required to ensure infiltration features are functioning and periodic maintenance will be necessary to ensure vegetated features meet the replacement standards in the Rule of a medium or high plant community ranking and minimum 50% of the total number of native species in an approved mix and 80% areal coverage. Permanent maintenance covenants will be required. Design standards for the infiltration features will be in the RMP Rule.

PROJECT PERMITTING PROCEDURES

The SAMP identifies priority wetland resources, provides sequencing guidance, and opportunities for wetland replacement credit. This upfront information is intended to avoid or minimize the number of incomplete or inconsistent applications. The RCWD implementing the WCA, the Corps implementing Section 404 of the Clean Water Act, the Minnesota Pollution Control Agency issuing Section 401 Water Quality Certifications, and the Minnesota Department of Natural Resources administering Public Waters protection all have regulatory authority over wetlands within the SAMP area. The SAMP has been developed with the input of each of these regulatory bodies. Because of the upfront participation and implementation of the CWA Section 404 framework, this SAMP provides defined expectations for alternatives analysis, review, and replacement.

Permit Issuance and Surety

A financial surety will be required upon permit approval for insurance against substandard performance of the replacement area. The surety will be incrementally returned as management is undertaken and approved by the RCWD. All replacement plans will need to describe management activities for the years of monitoring that are anticipated in order to meet the performance standards. Guidance for management activities and performance standards, as well as scheduled return of surety, will be in the Rule.

SAMP Guidance for Streamlined Wetland Permitting

The RCWD will maintain an interagency wetland communication to inform the TEP, including the Corps and City of Lino Lakes, of all parties considering land alteration activities covered under the SAMP.

This SAMP provides a vehicle to avoid unnecessary delays in the permit review process, but cannot guarantee any specific timeframes other than those specified under current state and federal rules for permitting. The contents of this SAMP and the supporting database of wetland information are intended to provide the permit reviewers with a greater knowledge base for making sound decisions on actions, impacts, and replacement that would otherwise not be available, particularly for addressing cumulative impacts. These procedures will be followed by the TEP/Corps to implement the SAMP.

This section of the SAMP is also written for those considering actions that have the potential to impact aquatic resources. All applicants are encouraged to review the sequencing requirements described earlier in this plan. The procedures provided here, if followed, should allow permit review to occur in a timely fashion, without requests for additional applicant information. Permitting procedures strongly recommend at least two iterative conceptual reviews with the Corps and RCWD to 1) develop actions that do not impact resources, either quantitatively or qualitatively, and thus do not require wetland impact and replacement permitting, or 2) progressively refine the concept and avoid and minimize impact on aquatic resources, before more detailed design and replacement planning can proceed. Related to this, applicants in Lino Lakes may be required to provide a written statement along with preliminary plan submittals to the City that states the RCWD and the Corps have completed at least two iterative reviews of conceptual plans.



Spotlight on the Rule: Submittals and Sureties

SUBMITTALS.

- (a) Except as provided below, an application for a permit review under this Rule will consist of application materials, fees and sureties as required by District Rules B (Procedural Requirements), C (Stormwater Management), Rule D (Erosion and Sediment Control) and F (Wetland Alteration), in addition to the submittals required under any other District Rule to which the proposal is subject.
- (b) A proposal that does not involve subdivision, grading or development of upland within the RMP area need not submit application materials required by District Rule C (Stormwater Management).
- (c) A proposal that does not involve fill, excavation or the partial or complete draining of a wetland within the SAMP area need not submit application materials required by District Rule F (Wetland Alteration). "Draining" includes altering surface or subsurface flows in a way that materially reduces wetland hydrology.
- (d) Unless exempted under paragraph 10(c) of this Rule, the application must include:
 - (i) A delineation report for each wetland on the property using methodology currently approved by District, state and federal authorities;
 - (ii) Wetland function and values assessments for normal and proposed conditions, using the current version of MnRAM or most recent state-approved wetland functional assessment models; and
 - (iii) All sequencing and replacement plan application components as listed in Minnesota Rules 8420.0520 and 8420.0528.
- (e) On District request, the applicant will conduct an assessment of protected plant or animal species within the project area.
- (f) The application will include an on-site location of all public and private ditches.
- (g) The applicant will provide such other submittals as are reasonably requested by the District.

SURETIES. Sureties required under Rule RMP-3 will be released as follows:

- (a) Stormwater management: when water quantity BMP's have been approved, disturbed areas have achieved final stabilization and temporary erosion and sediment control features are removed, and the landowner has submitted engineer or surveyor certification that the facilities conform to approved plans.
- (b) Vegetated buffer: after monumentation has been completed, vegetation has been established, and one full growing season has passed following construction certification.
- (c) Wetland replacement: in accordance with Minnesota Rules 8420.0630.
- (d) Reestablishment of Effectively Drained Wetlands and Floodplain Meadows, Upland Restoration/Conservation, Restoration of Degraded Wetlands used for Volume Credits must have vegetation established after one full growing season following construction certification has passed.

Note: Conditions of "District Rule B – Permit Procedural Requirements" that apply to the entire Rice Creek Watershed District continue to apply to the SAMP area.

Permitting Administration

The permit procedures to review development projects and consider permit applications within the SAMP area are shown in Appendix C for the PGP. This documented protocol is intended to avoid agency confusion and clarify applicant expectations. The RCWD will provide guidance on wetland permitting under the SAMP which will be posted on the RCWD website, provide workshops for landowners, planners, and professionals, and widely distribute the information to government agencies in the SAMP area. These steps are intended to guide the applicant through more structured and detailed alternatives analysis, as defined in state and federal rules, for avoiding, minimizing, and compensating for potential wetland impacts. The intent of the SAMP procedures is to provide an administrative structure for early off-site and concept plan on-site alternatives analysis.

APPENDIX A: LOCAL, STATE, FEDERAL RULES

SAMP Improvement Upon Existing State and Federal Wetland Rules

The SAMP will be implemented through the Rule RMP-3. The RMP improves wetland permitting over existing state and federal rules in the following ways. First, the permit process initiates the alternatives analysis and ‘sequencing’ process for avoiding impacts at early planning stages, which are often not captured by the typical federal and state approval processes. Second, the WPC and non-WPC classification sorts wetlands into high and low priority categories for protection; preservation of the high priority wetlands will protect landscape scale function that is typically overlooked in current permitting procedures, except for certain areas covered under other special Section 404 regulatory frameworks. Third, impact debits are applied to wetlands based upon wetland type, level of degradation, and overall function. Penalties are imposed for proposing impacts to non-degraded, stormwater-sensitive, and difficult to replace wetlands; this distinction is not made under current permitting procedures. Penalties will be given for not locating replacement wetlands in such a way as to enhance the landscape connectivity of existing wetlands and to reduce locating replacement wetlands in an isolated urban landscape. Fourth, the inseparable link between upland and wetland as parts of whole habitat complexes is required to be addressed, unlike existing rules; the SAMP goes as far as providing functional replacement credit for protecting this link. Fifth, wetland replacement is required in the same subwatershed (Lino Lakes plan area), unlike state and federal rules which have much less specific requirements (i.e. same major watershed, county or ecoregion). Sixth, use of replacement banking credits to offset impacts within the SAMP area is restricted to those credits generated within the SAMP area; this is more focused than federal and state banking requirements which use region-wide banks for impacts in unrelated watersheds.

Federal Section 401, Water Quality Certification

According to the federal Clean Water Act, applicants for a federal permit, such as Section 404 permits, for activities which may result in a discharge must obtain a state Section 401 water quality certification through the MPCA. A Section 401 water quality certification is granted if the applicant demonstrates that an activity, such as discharge of dredged or fill materials, will not violate Minnesota's water quality standards or result in adverse long-term or short-term impacts on water quality. Such impacts can be direct or cumulative with other indirect impacts.

Minnesota's water quality standards (Minnesota Rules 7050) are comprised of four parts:

- 1.) Beneficial use designations
- 2.) Numerical standards and criteria
- 3.) Narrative standards
- 4.) Non-degradation policy

In addition, greater protection is given to a category of waters listed as Outstanding Resource Value Waters (ORVW). These waters have received this designation because of their exceptional recreational, cultural, aesthetic, or scientific resource value.

The MPCA considers the following when evaluating Section 401 certification applications:

Compliance:

- 1.) Applicants must comply with the Clean Water Act and State water quality standards and rules.
- 2.) Fill, drainage, excavation or inundation of wetlands: All wetlands are included in the definition of waters of the state and thus are protected by water quality standards.

If a Section 404 individual permit is warranted, the Corps incorporates this information into a public notice, which also serves as the notice for the Section 401 water quality certification. Any conditions required to meet water quality standards included in the Section 401 water quality certification become conditions of the Section 404 permit. If the MPCA denies the Section 401 water quality certification, the Corps must then deny the Section 404 permit.

Federal Stormwater - NPDES

A 1987 amendment to the federal Clean Water Act required implementation of a comprehensive national program to address stormwater runoff. Stormwater regulations are part of the National Pollutant Discharge Elimination System (NPDES) permit program and the State of Minnesota also regulates the disposal of stormwater by a State Disposal System (SDS) permit. The MPCA administers both NPDES and SDS permits and issues combined NPDES/SDS stormwater permits.

Stormwater permits require the control of polluted discharges and applicants are required to develop stormwater pollution prevention plans (SWPPPs) to address their stormwater discharges. Each applicant determines the appropriate pollution prevention practices or "best management practices" to minimize pollution for their specific site. In addition to the NPDES/SDS permit, the MPCA may require other permits depending on the type and extent of the proposed activity.

State and Federal Environmental Review

The National Environmental Policy Act (NEPA) of 1973 established a formal process for reviewing the environmental impacts of major actions that have the potential for 'significant environmental effects'. This plan does not exempt proposed actions under NEPA. Not all projects require environmental review; it is determined by the nature, size and location of a project. The Minnesota Environmental Policy Act (MEPA) has a review process to ensure state consistency with federal rules. The MN Environmental Quality Board (EQB) adopted a detailed set of rules for the environmental review process. If environmental review is required under these rules, the Responsible Government Unit (RGU) works with the developer to complete the appropriate following documents:

- 1.) **Environmental Assessment Worksheet (EAW):** A screening tool to determine whether a full environmental impact statement is needed. The worksheet is a six-page questionnaire about the project's environmental setting, the potential for environmental harm and plans to reduce the harm.
- 2.) **State and Federal Environmental Impact Statement (EIS):** An in-depth analysis used for major development projects that could significantly change the environment. The statement covers social and economic influences, as well as environmental impact, and looks at alternate ways to proceed with the project.
- 3.) **Federal Environmental Assessment (EA):** Each Section 404 individual permit evaluation has a companion EA prepared by the Corps. This plan may be used for preparing that document.
- 4.) **Alternative Urban Areawide Review (AUAR):** An AUAR is a broad-scale environmental assessment used to evaluate potential cumulative environmental impacts from future urban development over a large geographic area. It is done in lieu of many individual Environmental Assessment Worksheets (EAWs) on smaller-scale, individual development projects within the defined area. Over 30 individual environmental elements are addressed in an AUAR.

Under MEPA, the State EIS is mandatory for projects whose nature, size, or location makes it inevitable that there is the potential for significant environmental effects. When not mandatory, case-by case decisions on the need for an EIS are based on the EAW, which may be prepared for two reasons: the EAW is triggered by mandatory categories in the EQB rules, or the EAW is ordered by a governmental unit either on its own initiative or as a result of a citizen petition. MN Rules, Chapter 4410.4300 identifies actions that automatically trigger the completion of an Environmental Assessment Worksheet. The following Subparts of Chapter 4410.4300 outlines activities within the SAMP area that may trigger an EAW:

Subp. 12. Nonmetallic mineral mining

Subp. 14. Industrial, commercial, and institutional

Subp. 27. Wetlands and protected waters

Subp. 36. Land use conversion, including golf courses

Federal Section 404, Clean Water Act

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (Corps) regulates the discharge of dredged or fill material into waters of the United States. Any activities proposing impacts to waters of the U.S., including wetlands, are subject to sequencing analysis and then consideration for replacement, with full replacement of the lost functions and values of the affected wetlands.

Currently, the project review and permitting associated with these regulatory functions usually occurs on a project by project basis, a process which can be lengthy and is vulnerable to the cumulative incremental loss of wetlands in an area over time. Recognizing this, recent years have seen an increased emphasis on moving towards a watershed approach.

There are several components of the SAMP that provide for effective CWA Section 404 review. The first is its inventory and assessment of aquatic resources in the basin, which provides improved awareness of the functions and quality of aquatic resources in the study area. Information from the inventory and assessment can be used further to support the specific long term protection efforts of other programs, such as the WPC of the SAMP.

At the start of 404 permitting review for a specific project proposal, the avoidance of water resources, including wetlands, is the foundation step in the sequencing principles of the environmental regulations for the program. A specific project proposal must first avoid aquatic areas. If this is not possible, then the project must minimize its impacts. For any unavoidable adverse impacts, compensatory mitigation must be provided to offset these losses. The SAMP accomplished this at an overall planning level for the watershed, making available the consideration of alternatives for a given applicant applying for a 404 permit.

Analysis of water resource management alternatives, and the selection of a preferred water control and management alternative for the basin, based on local comprehensive planning documents, provides for SAMP compatibility with Section 404. The SAMP does not include an alternatives analysis for individual developments in the basin. As detailed in the SAMP Permitting Procedures, individual development proposals must evaluate both off-site and on-site alternatives that avoid and minimize wetland impacts to the maximum extent practicable.

Another component of the SAMP that provides thorough Section 404 review is the establishment of compensatory wetland replacement guidelines applicable to proposed projects within the basin. As a result of coordination with the Corps, SAMP wetland replacement guidelines are consistent with CWA Section 404 guidelines for wetland sequencing and compensatory replacement.

To facilitate implementation of the SAMP, the RCWD, Corps, and BWSR have worked collaboratively to develop a process for applying a CWA Section 404 framework to project review under the SAMP that allows for consistent methods of analysis and cumulative impact/public interest review. This results in streamlining and dovetailing of the regulatory process, not necessarily shorter timelines.

Minnesota Drainage Law

MN Statutes, Ch.103E.715 Procedure for Repair by Petition

- Subd. 1 Repair Petition
- Subd. 2 Engineer's Repair Report
- Subd. 3 Notice of Hearing
- Subd. 4 Hearing on the Report

RCWD is the ditch authority for all ditch systems within its jurisdiction. Governed by the statutes specified in MN Statute, Ch. 103E, the RCWD is given authority for managing and maintaining the public ditch system. Following is a list of goals to be incorporated into the repair of ditches:

- Minimize future ditch maintenance costs by utilizing a self-sustaining design
- Protect against wetland functional losses and downstream flooding through volume control in the headwaters
- Recognize future development
- Maintain hydraulic efficiency to which benefited landowners are legally entitled by removing ditch obstructions

One of the more relevant articles in Drainage Law is Minnesota Statute, Ch. 103E.015, subdivision 2. This statute provides that in ordering any work affecting a public drainage system, the drainage authority "must give proper consideration to conservation of soil, water, forests, wild animals, and related natural resources, and to other public interests affected, together with other material matters as provided by law in determining whether the project will be of public utility, benefit, or welfare." The RMP assesses impacts of the repair alternatives on public and private welfare considerations including: (a) public road authority and other local governmental costs; (b) flood and stormwater management impacts within and below the SAMP area; (c) impacts on public and private development costs; (d) impacts on natural resources within and adjacent to the SAMP area; and (e) permitting and approval requirements that may result in the alternatives differing in the timeframe and possibility of their implementation.

Minnesota Wetland Conservation Act (WCA)

The Resource Management Plan was structured to meet the requirements set forth in the WCA MN Rules, Ch. 8420.0830 for Local Comprehensive Wetland Protection and Management Plans, summarized as follows:

Rules 8420.0830 Local Comprehensive Wetland Protection and Management Plans

- Subp. 1 General Requirements and Participation
 - o Notice made at beginning of process
 - o Plan is implemented by ordinance
 - o TEP consulted in all Plan components
 - o LGU must require equivalent or greater standards for wetland conservation
- Subp. 2 Plan Contents
 - o Inventory of wetlands
 - o Wetland functional assessment
 - o Public values
 - o Sequencing variance allowed
 - o Minimum 1:1acreage replacement
 - o Prescribe standards for size and location of replacement wetlands
 - o Allow exemptions as long as they are not less restrictive
 - o Establish high priority wetland areas
- Subp. 2a Project Notice and Appeal under Local Ordinance
- Subp. 3 Board Review and Approval

In addition, the plan meets these following two requirements. First, public ditch repair impacts to Type 3, 4, 5 wetlands require replacement under state wetland law (MN Rule 8420.0420 Subp. 3). Only under the public ditch exemption are the impacts to all other wetland types exempt from replacement.

The RMP implementation will be subject to review by the BWSR every five years under its process.

Metropolitan Council Regional Planning Agency

The City land use plan was prepared according to requirements of the Twin Cities regional planning agency. The requirements for implementation are provided here to assure that the City acts on the projects necessary to provide for in-advance mitigation and land use planning which is needed for a successful SAMP.

Capital Improvement Program Consistent with the Comp Plan

The Programmatic Alternatives Analysis for evaluating alternative comprehensive land use plans identified the RMP alternative as preferential for implementation by the City. By the time this SAMP is adopted, the City will be implementing the Comp Plan, as required by law, and in so doing will be implementing the goals and actions identified for aquatic resource protection under future conditions. The regional Metropolitan Council requirements for this are stated below.

According to Minn. Stat. 473.859 Subd. 4(2), comprehensive plans are required to include a capital improvement program (CIP) for four areas:

- Transportation,
- Wastewater,
- Water supply, and
- Parks and open space facilities.

The CIP shows how the municipality will support and implement the timing and financing of public improvements necessary for the municipality's planned growth.

In the CIP component, the municipality specifies the timing and sequence of major local public facilities that will ensure development of the municipality occurs in accordance with the plan.

According to Minn. Stat. 473.852 Subd. 4, the comprehensive plan must include the municipality's five-year CIP. That CIP, in turn, must include budgets and expenditure schedules for transportation, sewers, water supply, and parks and open space facilities.

The Metropolitan Council reviews the five-year CIP to determine that it implements the comprehensive plan and coordinates the planned projects with the development financing schedule.

Water Resources Expectations in the Comp Plan

The Metropolitan Council uses watersheds as their planning focus to control pollution from point and nonpoint sources and works cooperatively with watershed planning implementation. In addition, MC conducts research efforts and has developed resources such as the Urban Small Sites BMP Manual for nonpoint-source pollution control. From this perspective, the MC reviews the surface water management plans prepared by communities as a component of their comprehensive plans. The MC perspective is consistent with the watershed-based approach to permitting being used by the Corps for Section 404.

APPENDIX B: IN-ADVANCE COMPENSATORY MITIGATION STRATEGY

Statement of Need

The SAMP concerns future goal attainment of wetlands and aquatic resources through a watershed-based perspective.

From the PAA, two major watershed-based wetland goals are to be realized in implementing the SAMP:

- Maintaining wetland quantity in Lino Lakes,
- Maintaining wetland quality (functions) in Lino Lakes.

This requires attention to upland surface water management activities at the onset of SAMP adoption through full build-out as identified in the Comp Plan. It also requires implementing SAMP projects that are a priority and most required to achieve the goals for quantity and quality of wetlands and providing in-advance wetland credit. All wetland credits generated for use in the State Wetland Bank will be administered by the Board of Soil and Water Resources.

Implementation Strategy

The strategies to achieving future wetland quantity and quality goals are somewhat different.

Achieving no net loss in quantity shall generally use the strategy of providing for wetland impact replacement credit in the contributing subwatersheds of the impact wetlands. This strategy is to establish wetland replacement credit at desirable locations in the City for offsetting probable future impacts that were projected in the PAA.

Achieving no net loss in quality shall generally require watershed-based approaches to maintaining wetland functions. The RMU maps and descriptions for the future SAMP-based condition identify these four criteria that are important to maintaining wetland functions:

- sensitive water level points,
- stormwater sensitive wetlands,
- greenway corridor nodes and gaps,
- WPC buffers, and
- TMDL Implementation.

Selecting Priority Projects

The projects identified for each RMU are shown below in a goal-based approach for discussion of the priority projects. The table allows for stakeholder discussion and intentionally avoids a numeric ranking. This is because maintaining functional quality of wetlands does not have a regulatory surrogate of numeric credit the way that maintaining quantity does. A regulatory process of sequencing, impact assessment, mitigation, and permitting with numeric credit has not been developed for the goal of no net loss in quality. The selection of priority projects shall thus rely on a subjective discussion of the four criteria listed above. Stakeholders may decide to eventually consider the possibility of a future process for numeric crediting and permitting of land use projects that maintain wetland functions.

The goal-based evaluation of projects is not the final decision on whether to proceed to completion with certain potential projects. This evaluation allows for selecting projects identified at the Comp Plan and SAMP planning level to receive more attention at a field evaluation level to determine if the potential benefits and goals still hold up. Projects that rise to the top upon environmental goal screening should thus be subject to a feasibility assessment. The projects to be considered for feasibility assessment are described herein.

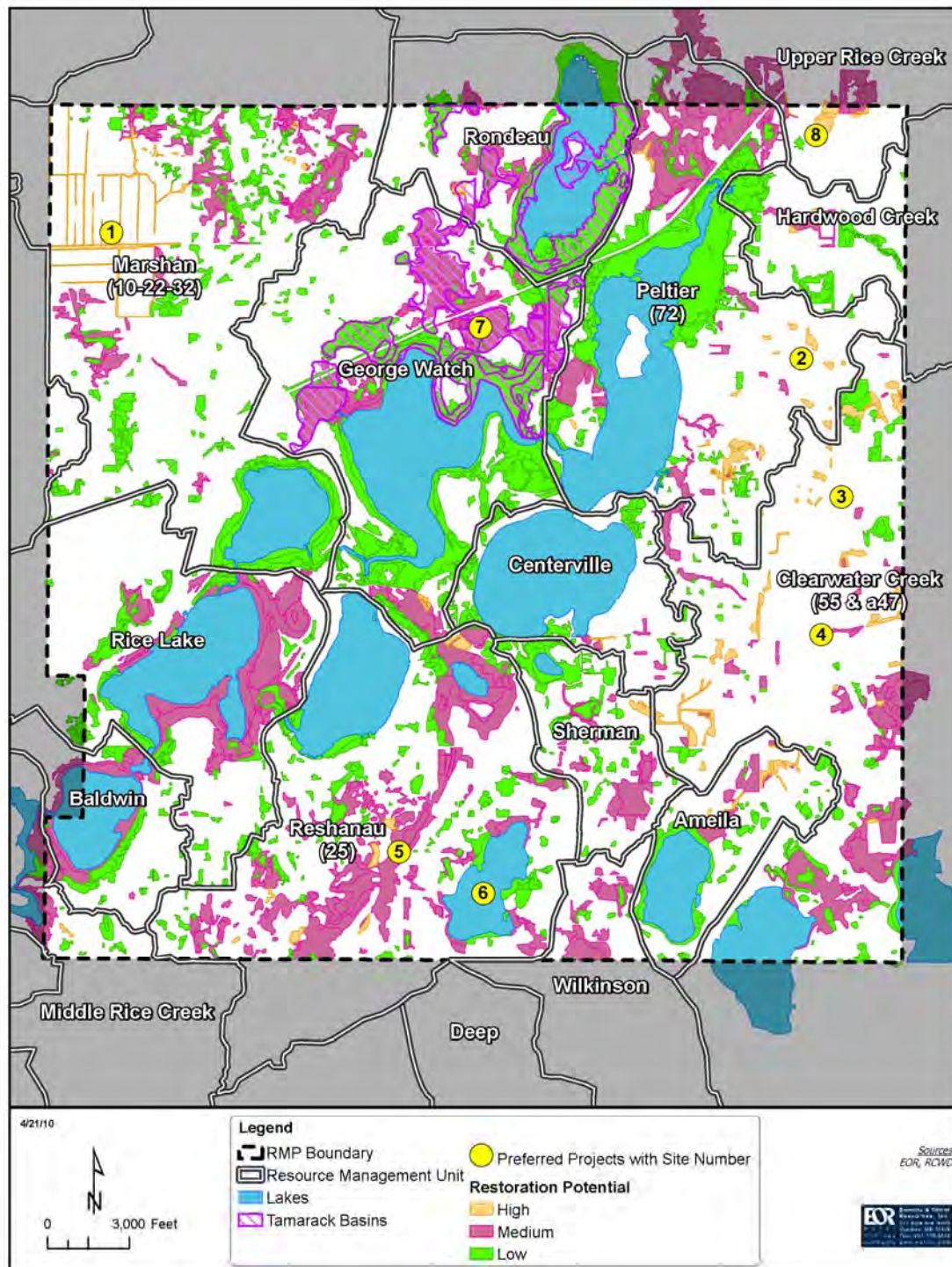


Figure 15. Resource Management Units in Lino Lakes

Table 11. Potential In-Advance Mitigation Projects in Lino Lakes

RMU	Problem	Project Description	Project Number	Goals Addressed For SAMP Future Land Use			
				Wetland replacement credit	Sensitive water level points	Stormwater sensitive wetlands	Greenway gap
Upper Rice Creek (URC)	Downstream confined tile requires strict adherence to volume control in future development	Volume guidance for future development	URC- 001	n/a	yes	n/a	n/a
Hardwood Creek (HWC)	Downstream impaired creek requires strict adherence to volume control in future development; riparian animal movement restricted	Volume guidance for future development	HWC-1	n/a	n/a	n/a	yes
Clearwater Creek (CWC)	ACD 55 tile system ineffective for traditional urban runoff volumes	Wetland restoration and volume credits for future development	CWC -062	yes	yes – 3	no	yes
Clearwater Creek (CWC)	Floodplain missing and unmitigated volume	Stream meander from straight channel	CWC-010a	yes	yes - 4	no	no
Rondeau (R)	Unregulated volume	Volume credits without wetlands for future development	R-1	n/a	no	yes	no
Peltier (PEL)	ACD 72 tile system ineffective for traditional urban runoff volumes	Wetland restoration and volume credits for future development	PEL-1	yes	yes – 3	no	yes
Centerville	RMU primarily in City of Centerville	None recommended at this time		n/a	n/a	n/a	n/a
George Watch	Threat to tamarack plant community	Monitoring to determine hydrology; possibly volume reduction in existing developed area	GW-1	n/a	no	yes	no
Marshan and 10-22-32	Ditch system ineffective for future urban runoff volumes	Wetland restoration credit at sod farms	MAR -097	yes	yes	yes	yes
Marshan and 10-22-32	Unmitigated volume	Volume reduction retrofits	MAR-2	n/a	yes - multiple	Possibly yes downstream	no
Rice Lake	Unregulated volume	Volume reduction retrofits	RLA- 021	n/a	no	yes	no
Rice Lake	Unregulated volume	Volume reduction retrofits	RLA- 022	n/a	yes	no	no
Reshanau	Unregulated volume	Volume reduction retrofits	RES -1	n/a	yes	no	no
Reshanau	High quality forest in WPC	Upland habitat area set asides	RES-2	n/a	no	no	no
Reshanau	Partially drained wetlands – ACD 25	Partial wetland restoration credit	RES-021	yes	no	yes	no
Baldwin	Unregulated volume	Volume reduction retrofits	B-1	n/a	no	yes	no
Sherman	Unregulated volume	Volume reduction retrofits	SH-1	n/a	no	yes	no
Amelia	Riparian animal movement restricted	VLAWMO led project	A-1	n/a	no	yes	yes
Wilkinson	Unregulated volume	VLAWMO led project	W-1	n/a	no	yes	no
Middle Rice Creek	Upland habitat area identified for greenway corridor	Opportunities for acquisition, easement	MRC-1	n/a	no	no	yes

Description of Preferred Projects

The preferred projects are most feasible for achieving the required quantity of in-advance wetland restoration credit and maintenance or restoration of high quality wetland functions. The preferred projects are as follows:

- 1.) Marshan RMU sod farm restoration (MAR-097),
- 2.) Peltier RMU ACD 72 tile system,
- 3.) Clearwater Creek RMU ACD55 tile system (CWC-062),
- 4.) Clearwater Creek channel meander and floodplain reestablishment (CWC-010a),
- 5.) Reshanau RMU ACD 25 ditch system,
- 6.) Reshanau RMU Cedar Lake restoration,
- 7.) George Watch RMU tamarack swamp protection, and
- 8.) Upper Rice Creek RMU project (URC-001),

Sod farm restoration (project 1, restoration of drained wetland) as conceived of for the SAMP provides numerous wetland function replacement opportunities. At the appropriate time, it will be an excellent site for in-advance wetland credit, as well as providing for greenway corridors in planned future development areas, and addressing surface water runoff volume management. The plan is not proposed for feasibility assessment at this time because the conceptual scenario may be subject to future changes that make credit estimation not reliable.

The second two areas, tile systems, will need to be evaluated for their role in urban runoff management. A conceptual restoration plan was developed for the SAMP, and this should be subject to iteration as development in the area progresses. Conceptual planning of tile system restoration would need to address multiple goals, including replacement credit and surface water management. Currently the tile systems for the most part effectively drain all surrounding former wetland. Even though conceptual greenway corridors are shown in the Comp Plan, several unknowns and potential scenarios exist, and therefore it is deemed more prudent not to spend time now on more data collection for feasibility of establishing restoration credit. It is deemed more prudent to address the goals, including the extent of restoration credit that could be obtained, at the initial onset of a more concrete development scenario.

The Clearwater Creek channel and floodplain restoration addresses several environmental goals and is in a location with relatively few separate property owners. The project has the potential to provide better property development potential if it opens up bigger blocks of land on the parcels that are now bisected by the straightened channel. This project should go forward when the City achieves a coordinated agreement among the multiple property owners for the project.

The ACD25 ditch system is in an existing urban development area. The Repair Report identified numerous benefited properties from larger parcels to numerous subdivision lots, and including the lands around Cedar Lake and up to Wards Lake. The Comp Plan identifies the ditch system as a greenway corridor. Because the ditch system is encompassed by a large, partially drained network of wetlands, it is feasible and practicable to assume that the existing footprint will be the site for potential wetland restoration credit. Areas identified at a landscape scale as partially drained wetland invariably encompass a range of conditions from some areas with minimal drainage to areas with extensive drainage. The potential wetland restoration credit can only be estimated from field surveying to identify the range of conditions. This technical exercise is generally straightforward and is recommended for frozen or near frozen ground conditions for more efficient foot travel and recording of winter botany vegetation indicators at the same time as detailed elevation surveying. This would be used for a feasibility design and cost estimate that can be used by the City and Watershed District for a coordinated effort to present findings to the adjoining property owners.

Currently Cedar Lake is primarily mapped as a marsh. The hydrologic and biological condition would be investigated to determine the feasibility of establishing a shallow lake system. Field investigations are needed to determine the interspersions of wetland plant communities and indicators of surface water and groundwater condition for supporting a shallow lake.

The seventh preferred project seeks to enhance one of the city's highest priority wetland areas adjacent to George Watch Lake. The area consists of two portions on either side of I-35W that are representative of groundwater-dependent hydrology and support a relatively high level of biodiversity for the City. The SAMP hydrologic modeling identified that there is a connection between the wetlands and the immediate upstream urban drainage system. The extent of the connection, the effects on the wetland, and thus how best to address specific threats, require site level data collection focused on better understanding the site's interacting groundwater and surface water hydrology.

The Upper Rice Creek RMU is a subwatershed area zoned for future urban development. With a confined downstream tile and potential interstate road barrier, the potential for onsite volume reduction in the project area should be investigated to avoid the possibility of an expensive project to expand the capacity at the downstream end. Feasibility assessment would involve such technical investigations as more detailed mapping of soil infiltration and biofiltration potential.

Feasibility Analysis for Recommended Projects

From the discussion of Preferred Projects, five projects are recommended for feasibility analysis at this time. They are:

- Upper Rice Creek RMU volume reduction potential,
- George Watch Lake groundwater-dependent wetland restoration,
- Cedar Lake hydrologic and vegetative restoration,
- ACD 25 wetland restoration,
- Clearwater Creek channel and floodplain restoration.

The feasibility report for each recommended project would provide the same general types of information. This includes the field-level data needed to better determine whether the potential benefits identified in the landscape-level analysis still seem to be feasible, what kinds of possible cost investments for design, construction and long-term maintenance (full life cycle costs) would be needed to attain goals, potential sources of life cycle funding, and private and public entities with an opportunity to benefit from the project. The needs for each feasibility assessment are presented here for each recommended project. In some cases the project feasibility will need to address potential complications with multiple land owners.

The first step for each feasibility assessment is to collect detailed site data needed to address the problems identified in the SAMP. The details will differ for each project because of the different resource types, problems identified, and potential solutions, but the basic approach will be the same. Mapping scales are described in the SAMP as Level I, II, and III. The mapping used for the landscape-scale SAMP is Level II. For feasibility of providing in-advance mitigation credit, Level III data are needed.

The second step is to estimate the quantity of in-advance credit to meet the wetland vegetative integrity function or other functions for the RMP alternative. All wetland plant community goals follow the classification according to Eggers and Reed as published by the Corps of Engineers. Reporting of the in-advance credit estimates will include the results of discussion with the TEP as to whether the estimates seem reasonable and practicable to achieve.

The final step is to address projects costs. A value engineering approach will be used (design, construction, long-term operations and maintenance). The life cycle cost estimate will also consider the long-term costs to surface water volume management from not doing the projects. The Water Environment Research Foundation has a new model called 'greenpay' under their 'Using Rainwater to Grow Liveable Communities' website. <http://www.werf.org/livablecommunities/>. Greenpay is a value engineering framework for making decisions that incorporates value and benefits into cost considerations and life cycle costs, not just construction expenses. This model is consistent with the life cycle cost approach and has some specific features that can be included, but does not completely fit the needs for each of the projects being considered. The greenpay framework will be used as a starting point to address project costs for the recommended options and also the costs of not implementing watershed-based management with respect to the upland-wetland interaction.

Project 1 – Upper Rice Creek Volume Reduction

To protect the hydrologic regime of downstream resources and reduce the potential for downstream flooding, planning in the Upper Rice Creek resource management unit will require assessing the most feasible locations for wetland restoration that will also assist in meeting the stormwater volume reduction goals for this management unit. Current land use is agricultural. In figure 15, the white and black arrows signify the direction of catchment flow. A small portion of the subwatershed is in Lino Lakes, and it is zoned for commercial and industrial to the east and rural residential to the west. Level III mapping will more closely examine soil and topographic conditions ideally suited for volume reduction and wetland restoration. Existing mapping shows large areas of hydric soil that may have potential for hydrologic restoration (see Figure 8) and roughly correspond with the stippled area on Figure 16.

The wetland area just west of I-35E appears to have been drained during past agricultural activities. It appears that there are opportunities to restore partially drained wetlands and at the same time reduce volumes delivered downstream. The black and white dots on Figure 15 represent culverts that must be kept open for free flow of water and to prevent overtopping. The restoration opportunity would function for water storage and prevention of overtopping at the culverts. A feasibility assessment should be completed to determine the potential benefits/credits that could be obtained and evaluate the cost of implementation. The existing landowner is interested in working with the City and District to assess opportunities for this site.

Initial Feasibility Assessment Tasks:

- Task A) Topographic survey including any onsite private ditches/tiles and adjacent wetland areas
 - Task B) Vegetation assessment – a detailed field survey focusing on plant communities within the basin that indicate the presence of groundwater hydrology or partial drainage.
 - Task C) Monitoring wells – installation of monitoring wells to establish baseline for determination of existing hydrology and potential mitigation credits.
 - Task D) Assessment of basin management options – Utilizing the results from the surveying, hydrologic indicator assessment and monitoring, options for wetland restoration will be explored. An initial assessment on whether the proposed options would have the potential to qualify for wetland mitigation credits would also be included.
- Final Report with recommendations and cost estimates – A short report containing a summary of work completed, maps of data collected, potential management options and cost estimates for the recommended option(s).

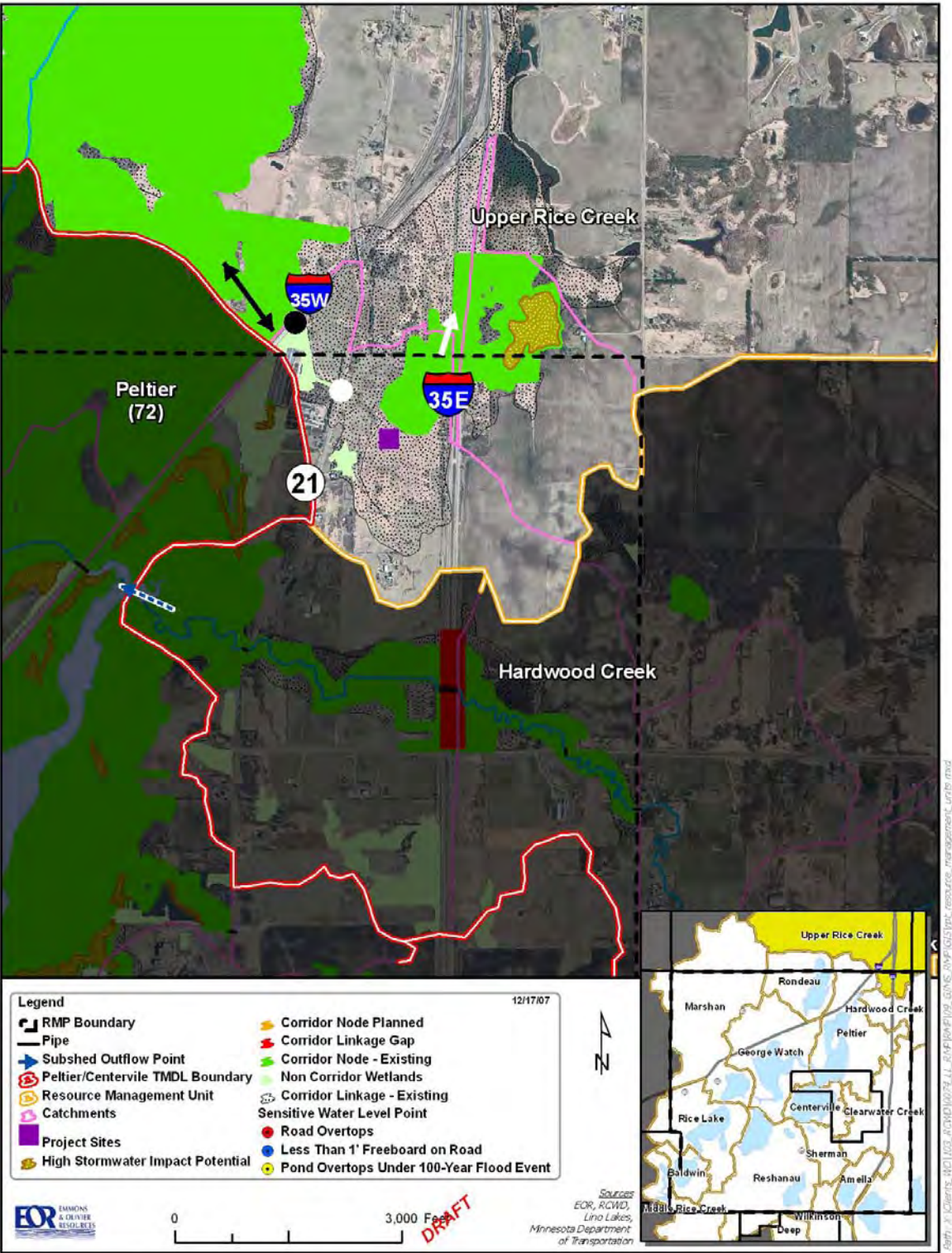


Figure 16. Project #1- Upper Rice Creek Volume Reduction

Project 2 – George Watch Lake Groundwater-dependent Wetland Protection

Wetlands supporting tamarack were identified by the City natural resources staff as the most critical wetland resources to the City and mapped as shown here. At the onset of the RMP preparation, staff emphasized the importance of these areas as a priority to the City, and they have been incorporated into the WPC. The wetlands proposed for feasibility assessment are to the northwest of George Watch Lake but primarily south of I-35W. The goal will be to analyze the potential for mitigation credit using protection of significant resources, and whether existing or anticipated subwatershed activities pose a threat to the resource. The City staff may want to shift the priority to the adjacent basin to the north or assess both basins. The tasks described below are for the basin primarily south of I-35W.

Tamarack are typically key indicators of groundwater hydrology. To sustain the tamarack and the associated plant communities, the proper hydrologic regime and water chemistry are needed. Degradation can occur when the hydrology is altered by shifting to influence by surface water inputs, changing the hydrologic regime and the water chemistry.

Initial Feasibility Assessment Tasks:

Task A) GPS survey of basin surface water pathways – a field reconnaissance to survey points and pathways of flow and connectivity to the overall basin surface area

Task B) Hydrologic indicator assessment – conduct a detailed hydrologic indicator assessment in the field assessing correspondence between wetland hydrology and plant communities within the basin.

Task C) Hydrologic Monitoring Points Identification – a field reconnaissance of the basin will be completed to identify groundwater and surface water monitoring points for collection of water quality data

Task D) Data analysis for hydrologic and biological protection – the results from Task A-C will be analyzed to identify specific hydrologic and biological threats and the options for mitigating impacts

Task E) Final Report with recommendations and cost estimates – A short report containing a summary of work completed, maps of data collected, options for addressing identified threats and value engineering cost estimates for the recommended option(s).

Tasks A-C will be completed together.

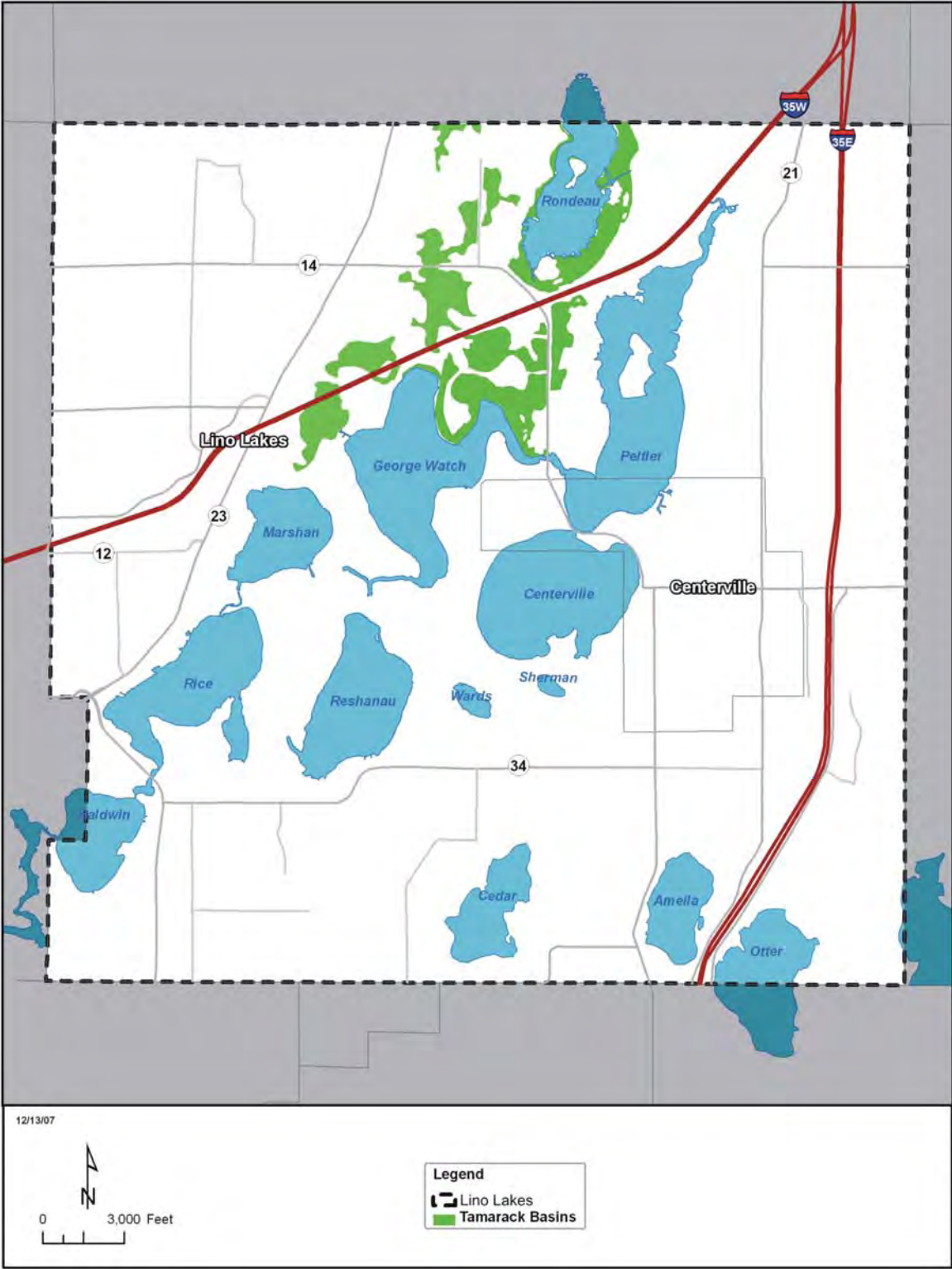


Figure 17. Project #2- George Watch Lake Groundwater-dependent wetland Protection

Project 3 – Cedar Lake Hydrologic and Vegetation Restoration

Cedar Lake is hydrologically connected to ACD 25 (see Project 4) through the Branch 1 ditch channel. Existing aquatic resource mapping identifies the lake as a marsh with full emergent vegetation cover dominated by cattails, and this is considered to be the result of partial drainage. Cedar Lake can be seen in the following aerial photograph in the lower right at the source of Branch 1. The feasibility of restoring a shallow, open water community to this basin is to be investigated. The anticipated in-advance mitigation credit will also be investigated for the potential to support wild rice beds within the shallow open water and identifying degraded areas of groundwater-dependent sedge meadow/rich fen communities.

Initial Feasibility Assessment Tasks:

- Task A) Basin topographic survey – a detailed topographic survey of the basin will be completed
- Task B) Hydrologic indicator assessment – a detailed hydrologic indicator assessment would be completed in the field assessing wetland hydrology and plant communities within the basin.
- Task C) Assessment of water level manipulation options – Cedar Lake was historically ditched by Branch 1 of Anoka County Ditch 25. An assessment of options and a preliminary assessment of potential impacts to property owners will be done to assess the feasibility of abandonment or impoundment for the upstream section of Branch 1. Options for a control structure at the outlet of Cedar Lake will be explored and modeled utilizing the Lino Lakes SWMM model.
- Task D) Assessment of Basin management options – Utilizing the results from the hydrologic indicator assessment and assessment of water level controls, options for the restoration/management of Cedar Lake will be explored. An initial assessment on whether the proposed options would have the potential to qualify for wetland mitigation credits would also be included.
- Task E) Final Report with recommendations and cost estimates – A short report containing a summary of work completed, maps of data collected, potential management options and cost estimates for the recommended option(s).



Figure 18. Project #3- Cedar Lake Hydrologic and Vegetation Restoration

Project 4 – ACD 25 Degraded Wetland Restoration

The feasibility of this project will depend on an agreement over the use of the ditch historically as a public benefit for land drainage and the benefits of managing the ditch for wetland functions and values. Many parts of the benefit area are now smaller residential parcels as opposed to larger agriculturally managed farms. This means a large number of owners are legally entitled to benefits from management of the ditch, which complicates the final decision. Anoka County Ditch 25 (ACD 25) is an open channel agricultural ditch system in the subwatershed of Reshanau Lake, a lake identified as an impaired water. In 2007 the Rice Creek Watershed District performed a repair report for ACD 25 assessing the condition of the ditch and the costs and associated impacts to wetlands that would result from repair of the ditch. That report showed a significant amount of partial drainage occurring to Type 3 wetlands if the ditch were repaired to the official profile. Per the Wetland Conservation Act this partial drainage would require mitigation. The following map shows the predicted result of a ditch repair (LE, lateral effect). With land use in this area quickly changing from agricultural to residential, management of the system should be tailored to fit the needs of the community.

The wetlands of ACD 25 main branch have been identified as a future city greenway corridor. In order to provide a contiguous healthy corridor, an overall management plan needs to be developed for the ACD 25 ditch system that will not only serve the communities needs but have demonstrated benefits for the landowners owning property along this corridor. The competing interests of drainage law and wetland law need to be balanced and addressed as a whole. The initial feasibility assessment will explore options such as ditch impoundments and ditch abandonment and assess associated impacts/benefits to landowners. It appears from an initial assessment of the area, through the Lino RMP, that wetland restoration options are numerous and could provide significant acres of wetland credits providing a financial incentive for both the landowners and the City to pursue targeted restoration projects.

Because ACD-25 will also serve as a stormwater conveyance route into the future, wetland restoration options will also take into consideration water quality treatment enhancements and volume reduction measure to help address the down stream nutrient impairments.

The objective of the feasibility assessment would not only provide options for an overall management plan for the system, but would also provide concept designs of implementable projects that could generate wetland credits for the City. The final report would provide estimated costs and benefits of the selected projects and would be a document that could be used to further discussions and negotiations with landowners along the corridor.

Initial Feasibility Assessment Tasks:

- Task A) Assessment of existing monitoring data and recommendations for supplemental monitoring needs.
- Task B) Field recon and supplemental surveying (as needed).
- Task C) Identification of targeted areas for restoration projects
- Task D) Development of overall ditch management plan options and assessment of impacts/benefits to affected property owners
- Task E) Concept design for selected restoration projects
- Task F) Final report with locations and quantities of credit benefit and value engineering cost estimate

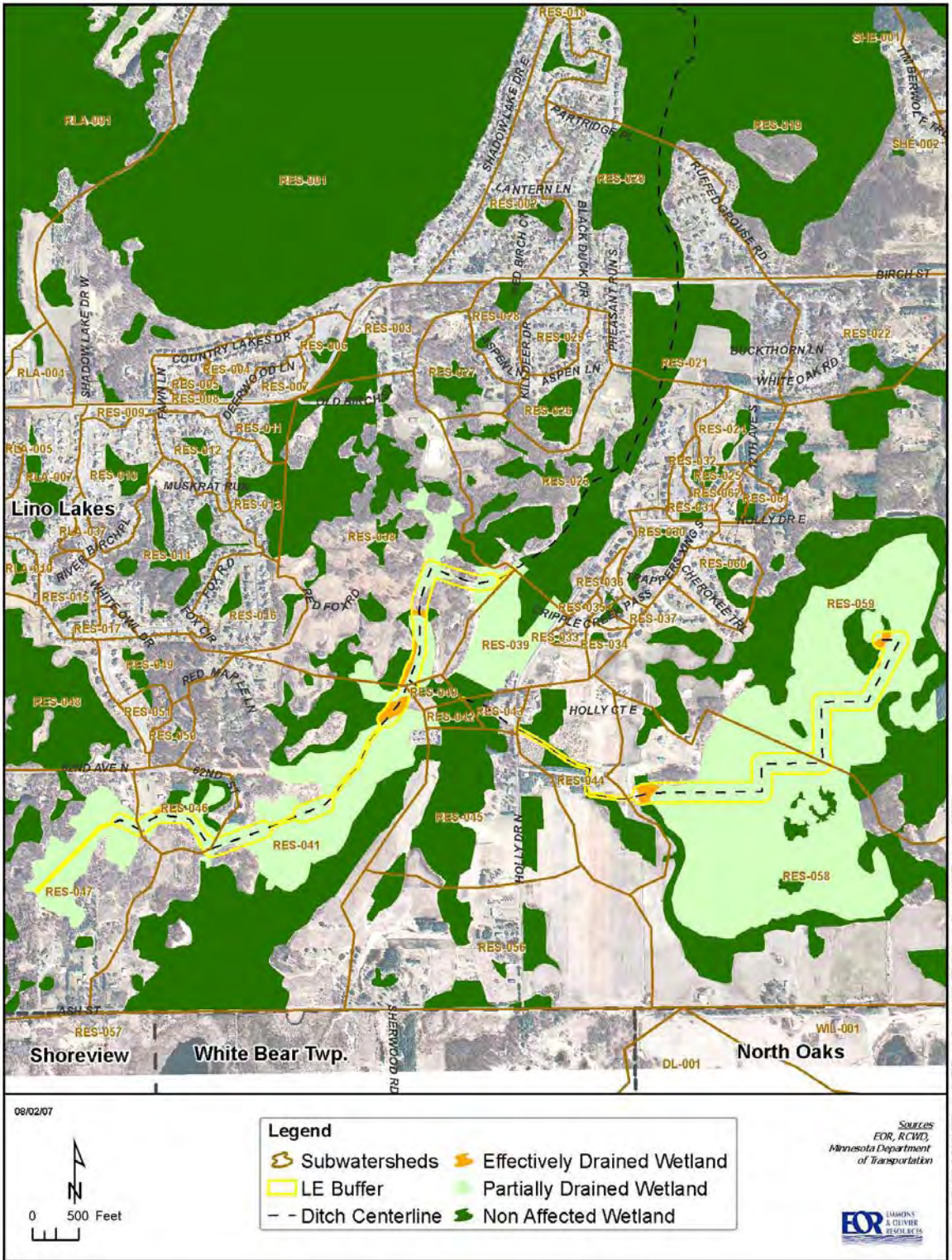


Figure 19. Project #4- ACD 25 Degraded Wetland Restoration

Project 5 – Clearwater Creek Channel and Floodplain Restoration

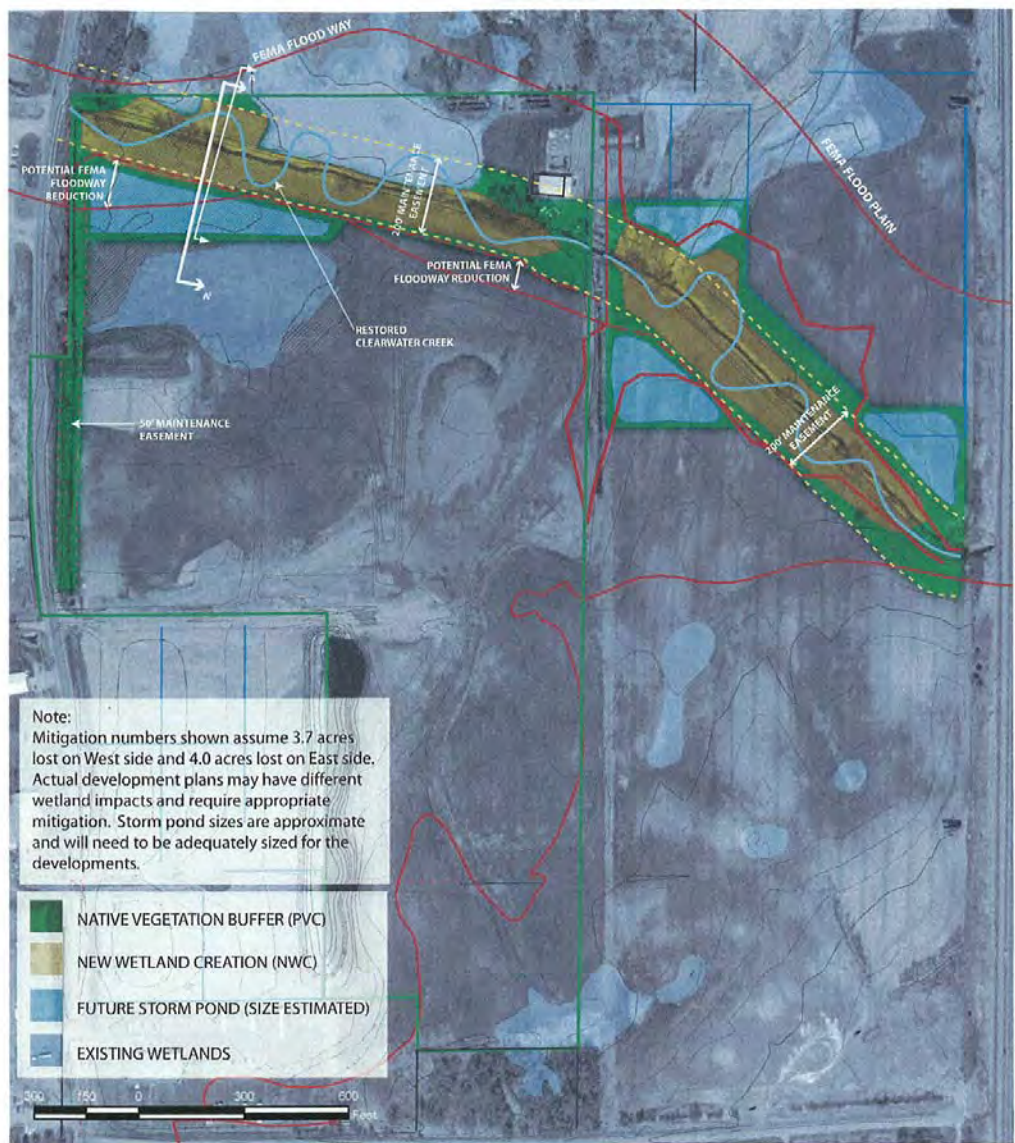
Clearwater Creek was historically a complex of wetlands and a naturally meandering stream prior to being straightened and lowered as part of Judicial Ditch 3 (JD-3) in 1913. Because of the infrastructure built around JD-3 and the use of JD-3 as a major conveyance-way through Hugo, Lino Lakes, and Centerville, restoration of this stream and wetland complex to pre-settlement conditions is not practical at this time. However, there are opportunities to improve the ecological and hydraulic function of Clearwater Creek, while increasing the economic and social value of the properties. It is recommended that as parcels are developed and redeveloped, a geomorphological approach be employed to enhance/restore Clearwater Creek as part of the development. Restoration solutions should re-establish the floodplain, emulating a natural stable channel. The number of new creek crossings should be minimized. Existing and proposed crossings should be designed using a stream simulation design method. If designed correctly this system could address both floodplain and wetland mitigation needs for this site.

Because the design of a stable stream corridor is complex and generally not a requirement of development permits, having design criteria ready prior to development would be beneficial. The feasibility assessment will examine the stretch of stream located between I-35E and 20th Avenue located within both Centerville and Lino Lakes (see Site 4 on the map). A concept design for this corridor has already been developed by the District as part of pre-permit planning. This effort would use that concept design and take the effort to the next level defining the key design requirements that should be applied to this reach. The key geomorphic design requirements would include: stable profile, alignment, channel cross-section, floodplain width, bed materials, construction and stabilization techniques, and integration of future stormwater techniques into the corridor.

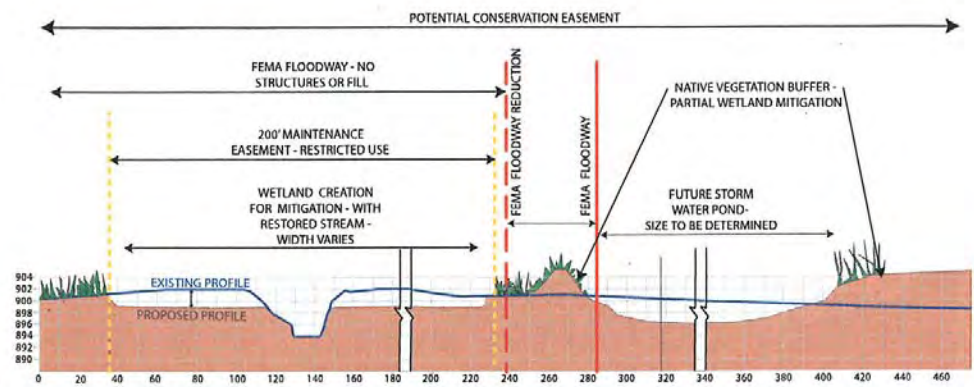
The feasible geomorphic design would then be used to establish wetland plant community restoration goals. Areas for each community would be mapped and existing condition and proposed condition would be compared to estimate wetland restoration credit that would be available to meet project-related mitigation needs or used for other local wetland projects. The task will include discussion with interagency TEP members. Since this reach is listed as impaired for macroinvertebrates and fish, a natural channel design could help reestablish a healthy biotic community.

Initial Tasks:

- Task A) Assemble all available background data
- Task B) Field surveys for topography, channel features, and vegetation
- Task C) Modeling of channel configurations
- Task D) Geomorphic design recommendations including channel and floodplain profiles and typical sections.
- Task E) Final Report on wetland plant community restoration goals



WETLAND MITIGATION CONCEPT PLAN B - STREAM RESTORATION



WETLAND MITIGATION TYPICAL CROSS-SECTION - PLAN B

Figure 20. Project #5- Clearwater Creek Channel and Floodplain Restoration

APPENDIX C: CLEAN WATER ACT SECTION 404 PERMIT

ACTUAL TERMS OF THE PGP TO BE INSERTED HERE

APPENDIX D: DEFINITIONS, ACRONYMS & REFERENCES

Applicable Definitions

Better Site Design – an approach to residential and commercial projects that seeks to accomplish three goals of reducing the amount of impervious cover, increasing natural lands set aside for conservation, and using pervious areas for more effective stormwater treatment, through the review of every aspect of site plans and use of creative grading and drainage techniques to reduce stormwater runoff and encourage more infiltration.

Biofiltration- A stormwater quality and quantity BMP that utilizes vegetation and soil to filter and absorb pollutants including nutrients, hydrocarbons and metals and remove water volume through evapotranspiration.

Contributing Drainage Area- Geographic areas tributary to Peltier Lake and Baldwin Lake from which banked replacement credits may be used to replace wetland impacts.

Filtration-A stormwater quality BMP that uses either natural media such as soil or vegetation or manufactured media to trap pollutants such as nutrients and particles in surface water.

Marginally Degraded Wetland-State of degradation for existing wetland reflecting score of low/high or high/low for functional indicators outlet condition/vegetative quality, respectively, using MnRAM 3.0 or other state-approved wetland functional model.

Moderately Degraded Wetland-State of degradation for existing wetland reflecting score of low/medium or medium/medium for functional indicators outlet condition/vegetative quality, respectively, using MnRAM 3.0 or other state-approved wetland functional model.

Natural Heritage Ranking – Plant community ranking methodology as described by the Minnesota Department of Natural Resources Natural Heritage Program, Minnesota’s Native Vegetation version 1.5 or as amended.

Non-Degraded Wetland- State of degradation for existing wetland reflecting score of medium/high, high/medium or high/high for functional indicators outlet condition/vegetative quality, respectively, using MnRAM 3.0 or other state-approved wetland functional model.

Onsite Mitigation or Replacement – to maintain wetland functions within the same contributing drainage area (CDA- see Figure 1) of the impacted wetland.

Partially Drained Wetland– A wetland that has had its original, natural hydrology altered by shifting through drainage alterations to a drier hydrologic regime.

Plant Community Ranking- Vegetative plant community ranking as defined in MnRAM 3.0 for each Plant Community Type.

Plant Community Type- One of the 12 plant community types defined using the “Wetland Plant Community Types” as defined by S. Eggers and D. Reed.

Primary Replacement Credit - A form of wetland replacement credit that can be used for any part of the wetland replacement obligation The SAMP differentiates this type of wetland replacement as a Primary Replacement Method.

Resource Management Unit -. Hydrologically defined areas identified in the Resource Management Plan that include specific required stormwater management strategies, resource protection recommendations and implementation projects.

Secondary Replacement Credit -A form of wetland replacement credit that can only be used for a part of the wetland replacement required above a 1:1 ratio. The SAMP differentiates this type of wetland replacement as a Secondary Replacement Method.

Severely Degraded Wetland-State of degradation for existing wetland reflecting score of low/low or medium/low for functional indicators outlet condition/vegetative quality, respectively, using MnRAM 3.0 or other state-approved wetland functional model.

Technical Evaluation Panel –The body described in Minnesota Rules 8420.0240, as amended.

Upland Buffer –An upland area of native vegetation that is contiguous with the final WPC or an existing restored or created wetland with an average width of 50 feet and minimum width of 25 feet.

Upland Habitat Area – a nonwetland area that is contiguous with an existing, restored, or created wetland and scores “C” or better using the Natural Heritage Ranking methodology.

Water Quantity Best Management Practice – the use of on-site runoff management practices such as biofiltration, infiltration, buffers/conservation areas, impervious disconnection, greenway connections in a WPC. to satisfy stormwater management or wetland replacement requirements.

Wetland Impact-A loss in the quantity, quality, or biological diversity of a wetland caused by (a) draining, partially draining, filling, excavating, or diverting water from a wetland; or (b) type conversion of a wetland, by inundation or other means, without maintaining or improving wetland functions.

Wetland Preservation Corridor (WPC)- High-priority wetland resources conceptually defined by the SAMP and delineated at the time of individual project permitting as:

- (i) Wetland community that is physically contiguous with (not separated by upland from) the landscape scale WPC alignment shown in Figure 1 and/or that ranks high for vegetative integrity using MnRAM 3.0 or most recent state approved model and.
- (ii) Wetland community meeting the vegetative integrity criterion of paragraph (i) and any part of which is within 50 feet of the community identified under paragraph (i)

Acronyms

ACD – Anoka County Ditch

BWSR – Minnesota Board of Water and Soil Resources

CDA – Contributing Drainage Area

Corps – United States Army Corps of Engineers

CWA – United States Clean Water Act

EPA – United States Environmental Protection Agency

EOR - Emmons & Olivier Resources, Inc.

FBO – Full Build Out

PWI – Minnesota Protected Waters and Wetlands Inventory

MLCCS – Minnesota Land Cover Classification System

MNDNR – Minnesota Department of Natural Resources

MnRAM – Minnesota Routine Assessment Method (for wetland functions and values)

MPCA – Minnesota Pollution Control Agency

NHP – Minnesota Natural Heritage Program

NPDES – National Pollutant Discharge Elimination System

NWI – National Wetlands Inventory

RCWD – Rice Creek Watershed District

RMP – Resource Management Plan

RMU – Resource Management Unit

TEP – Technical Evaluation Panel

TMDL – Total Maximum Daily Load

USEPA – United States Environmental Protection Agency

USFWS – United States Fish and Wildlife Service

WCA – Minnesota Wetlands Conservation Act

WPC – Wetland Preservation Corridor

WPZ – Wetland Preservation Zone

List of Technical Memoranda

In 2003 comprehensive wetland planning efforts were started for several subwatersheds of the Rice Creek Watershed that have public ditch systems. The subwatersheds are named by the prominent ditch system affecting the wetlands in the subwatershed. These are ACD 53-62, ACD 15, JD4, ACD 10-22-32, ACD 46, and ACD 31. In general, the areas encompass approximately 30,000 acres of the middle section of the watershed.

Beginning in 2003 many technical memoranda were prepared to address the concepts, data collection methodology, and analysis of results. These are published as Appendix N of the 53-62 RMP and Ditch Repair Report and listed below.

Agreement on Procedures For Technical Evaluation Panel Involvement In Developing Comprehensive Wetland Management & Protection Plans In The Rice Creek Watershed District

Memorandum: Wetland Type Designation Protocol in RCWD CWMPs

Memorandum: Establishment of WPAs in RCWD CWMPs

Memorandum: Use of Exceptional Natural Resource Value Projects in RCWD CWMPs

Memorandum: GIS PWI/MLCCS Analysis for RCWD CWMP Areas

Use of a MnRAM 3.0-based Wetland Functional Assessment in the Resource Management Plan For the Anoka County Ditch 53-62 Watershed

Specific Changes Made to MnRAM 3.0 For the RMP Wetland Functional Assessment

“Existing Conditions” Wetland Functional Assessment Protocol Used in the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

“Feasible Repair” Wetland Functional Assessment Protocol Used in the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

“No Action” Wetland Functional Assessment Protocol Used in the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

“RMP Conditions” Wetland Functional Assessment Protocol Used in the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

Documentation Reviewed at the April 11, 2006 TEP Related to the Wetland Functional Assessment used in the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

Wetland Mitigation in the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

Agreement on Procedures for Technical Evaluation Panel Involvement for Individual Project Permitting in the ACD 53-62 Resource Management Plan

Project Permitting within the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

Use of Lateral Effect in the Resource Management Plan for the Anoka County Ditch 53-62 Watershed

Memorandum: Methodology Used for Determining Lateral Effect of Ditch Alterations in RCWD 53-62 RMP

Agency/Stakeholder Review of the RCWD 53-62 Resource Management Plan

List of Reference Materials

Numerous studies were used to prepare this plan. They are listed below.

Provided by the Watershed District

- Draft Lino Lakes High Priority Wetlands Memorandum (November 26, 2006)
- Lino Lakes RMP Landscape Scale Functional Assessment Existing Conditions Protocol (November 7, 2006)
- Draft Technical Report on Existing Conditions of Resources in the City of Lino Lakes, Minnesota (January 2, 2007)
- Lino Lakes Wetland Values Survey (April 9, 2007)
- ACD 25 Original Profile Assessment – Technical Memorandum (December 22, 2006)
- ACD 10-22-32 Original Profile Assessment Summary Memorandum (March 9, 2007)
- ACD 47, 55 & 72 Original Profile Assessment Summary Memorandum (April 5, 2007)
- SWAT Model Hardwood Creek TMDL (February 5, 2007)
- Draft Report Peltier Centerville Lake TMDL (May 5, 2007)
- Lino Lakes RMP Summary of Proposed Modeling Approach (for surface water modeling) (November 8, 2006)
- Memorandum on XP-SWMM Model Input Parameters (March 19, 2007)
- ACD 25 Repair Report
- ACD 10-22-32 Repair Report

Provided by the city

City of Lino Lakes 2030 Comprehensive Plan Update Background Document – Natural Resources Section (March 6, 2007)

Related Documents

Studies and RMPs not specifically undertaken to support the findings in this plan contain policies, rules, and methodology which are similar if not in fact the same as that for the LL RMP. They are listed below, and parts were used to complete sections of the SAMP.

- Resource Management Plan for the 53-62 Drainage Area and RMP-1 Rule (approved)
- Resource Management Plan for the JD4 Drainage Area and RMP-2 Rule
- RMP Rule Economic Analysis