COMPREHENSIVE WETLAND PLAN

Prior Lake-Spring Lake Watershed District | April 2012

Prior Lake Spring Lake
WATERSHED DISTRICT

Prepared by
Emmons & Olivier Resources, Inc.
for the Prior Lake-Spring Lake Watershed District

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Comprehensive Wetland Plan

for the

Prior Lake-Spring Lake Watershed District

Adopted
April 10, 2012

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ACRONYMS

BMP – Best Management Practices
BWSR – Board of Water and Soil Resources
CAC – PLSLWD Citizens Advisory Committee
CWF – Clean Water Fund (BWSR Program)
CWP – Comprehensive Wetland Plan (Local Process)
CWPMP – Comprehensive Wetland Protection and Management Plan (BWSR Process)
DAP – Detailed Area Plan prepared by Scott County
DNR – Minnesota Department of Natural Resources
EOR – Emmons & Olivier Resources, Inc
GIS – Geographic Information System
IRM – Integrated Resource Management
LGU – Local Government Unit
LSWMP – Local Surface Water Management Plan
MUSA – Metropolitan Urban Service Areas
MnDOT – Minnesota Department of Transportation
MnRAM – Minnesota Routine Assessment Method
NWI – National Wetland Inventory
PLSLWD – Prior Lake-Spring Lake Watershed District
QA/QC – Quality Assurance/Quality Control
SWAG – Storm Water Advisory Group
SWCD – Scott Soil and Water Conservation District
TEP – Technical Evaluation Panel
TMDL – Total Maximum Daily Load
USACE – United States Army Corps of Engineers
US FWS – United States Fish and Wildlife Service
WCA – Wetland Conservation Act
WLA – Waste Load Allocation
WMO – Scott County Watershed Management Organization
WREP – Wetland Reserve Enhancement Program
WRMP – PLSLWD Water Resources Management Plan (2010-2019)

1. EXECUTIVE SUMMARY

Prior Lake-Spring Lake Watershed District (PLSLWD) prepared this Comprehensive Wetland Plan (CWP) to accomplish goals and meet policies set forth in the Water Resources Management Plan (WRMP) adopted July 2010. This CWP was modeled after the Comprehensive Wetland Protection and Management Plan (CWPMP) process developed under Rule 8420.0830 for the Minnesota Wetland Conservation Act (WCA). The WCA Technical Evaluation Panel (TEP) served in an advisory capacity throughout the development of this CWP, and input was also received from a broad government stakeholders group, the PLSLWD Citizen Advisory Committee and a local public values survey of residents in the plan area. The TEP included representatives from the five WCA Local Government Units (LGUs) in the plan area; City of Prior Lake, City of Shakopee, Spring Lake Township, City of Savage, and Scott County Soil and Water Conservation District.

A thorough review of existing wetland data from the LGUs was used to ensure that this CWP complements and does not duplicate previous wetland inventory and planning efforts. The updated data collected as part of this project was used to develop wetland management standards, and will be used to support other important water resource management activities in the Watershed District.

A public meeting and public values survey was conducted early in the process to identify which wetland functions were valued by residents in the plan area. From 55 respondents, groundwater, surface water quality, and wildlife habitat were wetland functions identified as having the highest value. These findings informed the establishment of the Functions Based Wetland Management Classes including: Hydrology Management, Natural Areas Management, and Restoration/Enhancement. All other wetlands not identified by the Functions Based Wetland Management Class protocol described in this CWP shall follow the Basic Protection Standards as defined by Board of Water and Soil Resources' Minnesota Routine Assessment Method (MnRAM) for determining wetland functions.

The management classes prescribed in this CWP define wetland buffer and hydrologic bounce standards for each of the Functions Based Wetland Classes. The buffer standard allows "averaging" by specifying an allowable minimum less than the standard width. Replacement for impacted wetlands is preferred within the immediate vicinity. In cases where on-site replacement for impacts is not provided, replacement of lost functions must be provided by other appropriate Best Management Practices (BMPs) and habitat/ecosystem restoration activities.

This Wetland Plan is not intended to follow the Board of Water and Soil Resources' approval process for CWPMPs. The PLSLWD is not a WCA LGU, nor does this CWP propose to vary wetland mitigation requirements currently found in the WCA.

This Wetland Plan will be adopted by the Prior Lake-Spring Lake Watershed District as a local Resource Management Plan and recommendations herein will be used in the District's Rule making process being undertaking in 2012. Governing bodies overlapping the geographic boundaries of the District will be invited to participate in the Rule making process.

2. PROJECT BACKGROUND

2.1. Purpose & Need

The Water Resources Management Plan (WRMP) for PLSLWD was adopted on July 13, 2010. The WRMP identified wetlands as one of the resources to be managed. Goal #12 of the WRMP states, "*To restore, enhance and/or preserve wetlands or partially drained wetlands which provide natural attenuation of runoff volumes, improve water quality and provide fish and wildlife habitat. Perform wetland restoration projects in the District.*" Goal #11 of the WRMP states, "*To fully understand the character and condition of all wetlands in the watershed for the purpose of resources planning, restoration and permitting. Build on previous efforts to complete an inventory and function and values assessment of all wetlands in the watershed. The functional assessment shall inform District efforts to restore and/or enhance wetlands and the values assessment shall be informed by local government values. Participate where possible in the sequencing review process.*"

Eight policies were set forth in the WRMP for wetlands:

1. The District does not serve as the LGU for any of its member communities in regard to wetlands.
2. The District will actively cooperate with local governments to be well informed and involved in the review of potential wetland impacts and mitigation.
3. The District will promote regulatory programs conducted at the federal, state and local levels.
4. The District will seek all opportunities to avoid wetland impacts before pursuing minimization and mitigation discussions.
5. The District requires notice of all pending applications, hearings, and technical evaluation panels and will provide review and comment on pending Wetland Conservation Act applications.
6. The District discourages the use of wetlands for the placement of roads, highways and utilities.
7. The District will initiate collaborative projects with local governments that identify wetlands with high functions and values and encourage the development of wetland management plans to preserve those functions and values, and to identify wetland enhancement opportunities.
8. The District will maintain open communication with local governments and other organizations to initiate and partner on potential wetland restoration projects.

The process utilized during the initiation and development of this local Comprehensive Wetland Plan (CWP) followed that of a Comprehensive Wetland Protection and Management Plan (CWPMP) specified in the Minnesota Wetland Conservation Act (WCA). Although the PLSLWD does not intend to finalize approval from BWSR as a CWPMP at this time, the process was followed to ensure compatibility with WCA Rules. WCA Rule 8420.0830 Subpart 1 provides the purpose and eligibility to prepare CWPMPs as follows:

> A. As an alternative to the rules adopted under Minnesota Statutes, section 103G.2242, subdivision 1, and the public value criteria established or approved under Minnesota Statutes, section 103B.3355, a comprehensive wetland protection and management plan may be developed by a local government unit, or one or more

local government units operating under a joint powers agreement, provided that the requirements of this part are met. This part provides minimum standards. Local government units may require equivalent or more stringent standards and procedures for wetland conservation, but not less stringent standards and procedures.

B. The ultimate goal of a comprehensive wetland protection and management plan is to maintain and improve the quality, quantity, and biological diversity of wetland resources within watersheds through the prioritization of existing wetlands and the strategic selection of replacement sites. The purpose of developing a plan is to provide a watershed and ecosystem-based framework to make wetland impact and replacement decisions that meet state standards and locally identified goals and support the sustainability or improvement of wetland resources in watersheds while providing local flexibility as allowed under subpart 4.

C. Any local government unit opting to pursue development of a plan and incorporating this chapter into local ordinance must provide documentation to the board demonstrating local capacity to implement the plan.

2.2. Issues Identification

PLSLWD set out to complete a CWP to serve in practice like a CWPMP and prudently utilize financial resources in protection planning rather than costly future remedial projects.

PLSLWD provided a notice of intent August 4, 2010 in accordance with WCA Rule 8420.0830 Subp. 6. A for inviting participation in plan preparation (see Section 5.2 and 5.3 for list of organizations).

Identification of issues was initiated by the WCA Technical Evaluation Panel (TEP) established for intergovernmental oversight and guidance of plan preparation (see Section 5.2 for TEP members). The kickoff meeting on August 10, 2010 began the discussion of issues identification. Through the course of the project and input received through the process, four key issues were identified. Following is a discussion of each.

Issue 1. This Plan focuses on the gaps in inventory and management that are not covered by existing data and plans identified in Chart 2.2-1. Existing data gaps are identified as 'NA'.

Chart 2.2-1. Existing Wetland Data and Plans in the PLSLWD.

WCA Local Government Unit	Wetland Data	Wetland Plan	Contact Person
City of Prior Lake	Complete from 2005	Complete from LSWMP Feb 2005	Ross T. Bintner
Spring Lake Township	NA	NA	Kathy Nielson or Ben Meyer
City of Savage	Complete from 2001	Complete from 2000 CWPMP and 2012 Wetland Ordinance update	Jon Allen
City of Shakopee	NA	NA	Joel Rutherford
Scott County (SWCD) (for regions not listed above)	2003 drained and altered wetland inventory	Scott County Local Water Plan	Troy Kuphal or Paul Nelson

Issue 2. Continuity in management standards across the watershed, inclusive of existing city and township standards, should be evaluated and inconsistencies identified.

City of Savage

The City of Savage has wetland management classes and programmatic information as summarized below.

From Chapter 4 of the Savage 2030 Comprehensive Plan: designates regional wetland mitigation sites, potential regional stormwater pond sites, and wetland management classes. About 300 wetlands were identified and functions and values[1] evaluated.

The City of Savage 2000 CWPMP has wetland management classes, and these were updated in 2012 as follows:

Preserve: Maintain wetland and existing functions, values and wildlife habitat. Possible need for active management of wetland to protect unique features. Apply strict avoidance standards. May be appropriate to develop a conservation easement. A 50 feet average buffer is proposed.
Manage 1: Maintain wetland without degrading existing functions, values and wildlife habitat. Apply WCA sequencing process. A 40 feet average buffer is proposed.
Manage 2: Maintain wetland footprint. Improve wetland biological and plant community diversity/integrity or enhance other functions if possible. Apply WCA sequencing process. Consider for restoration. A 30 feet average buffer is proposed.
Manage 3: Allow for relaxed sequencing and replacement plan flexibility. Consider for restoration/enhancement. A 16.5 feet buffer is proposed.

Stormwater ponds were not evaluated in the Savage CWPMP, however the 2011 zoning code updates for stormwater management require pretreatment prior to discharge to wetlands. Runoff shall not be discharged directly into wetlands and must be treated according to the standards set forth in subchapter 152.407, Wetlands Overlay District Standards.

Savage additionally has a Natural Resources Inventory published in 2001 for areas considered to be least disturbed by human activity, based on Minnesota County Biological Survey criteria. General natural resource management recommendations are provided in the project report.

City of Prior Lake

Chapter 4 of the City of Prior Lake's 2005 local surface water management plan (LSWMP) serves as their Wetland Management Plan. This plan utilizes a wetland ranking method, based on functions and in comparison to the wetlands in the study area. Habitat protection/ranking categorizes wetlands as unique, high, moderate, or low, and is based on floral diversity/integrity plus wildlife habitat functions assessed using MnRAM. Stormwater protection/ranking as highly, moderately, or slightly/least susceptible to stormwater inputs is based on the criteria in *Guidance for Evaluating Urban Storm Water and Snowmelt Runoff Impacts to Wetlands* after scoring floral diversity using MnRAM. As stated in the plan, "*Wetlands that do not fall under the high, moderate, or least susceptible categories are considered slightly susceptible. (Note: This category also includes wetlands or wetland complexes that contain 40 percent floodplain forest, which is a slightly susceptible wetland community, with medium to exceptional floral diversity.)*".

[1] Minnesota Routine Assessment Method (MnRAM), version 2.0.

Management Category	Stormwater Phosphorus Pretreatment Recommendations
Highly Susceptible[1]	150 ppb[2]
Moderately Susceptible	200 ppb
Slightly Susceptible	200 ppb
Least Susceptible	250 ppb

1) Includes lakes, creeks, streams, and rivers (as defined by the USGS).
2) A multi-cell configuration with lower cell being a constructed wetland or infiltration basin is recommended to achieve these levels of removal.

In addition to the pretreatment standards shown above, the stormwater ranking class also sets hydrologic regime standards, buffer strip average/minimum widths and vegetation requirements, and structural setbacks. All of these standards are recommended strategies to protect wetland functions.

Scott County

In addition to these two municipal sources of wetlands data, Scott County also has several documents to be consulted for wetland planning. They are the 2006 Scott County Water Resources Plan (with wetland inventory), the 2009 Scott Watershed Management Organization (WMO) Comprehensive Water Resource Plan 2009-2018, and the natural resource inventory that is presented as natural area corridors in the county 2030 Comprehensive Plan Update. Corridors throughout the county are considered priority natural resources. Areas that include wetlands can be considered priorities for preservation.

The 2006 Scott County Water Resources Plan identifies Goals, Policies and Objectives that support this CWP. Section 4, "Goals and Policies" of that plan identifies the following goal:

> *"To protect and enhance wetland ecosystems by managing contributing watersheds, and to ensure/encourage a measurable net gain of wetland functions and acreage throughout the WMO."*

Ten policy statements were developed in the Scott County Water Plan. In summary those wetland policy statements pertained to achieving no net loss, encouraging avoidance of impacts, identification of restoration areas, mitigation, stormwater impacts, preservation of high functioning wetlands, buffers and public outreach.

Two specific objectives were identified. The first identifies the need for a Comprehensive Wetland Management Plan that includes a wetland protection program and the second is to establish wetland buffer requirements.

Issue 3: Focus on wetland functions and uses to best support TMDL implementation.

The PLSLWD Spring and Upper Prior Lake TMDL Implementation Plan is in draft form (as of January 2012). The wetland functions and uses that might be relevant to that plan would be related to wetland restoration with potential to enhance water quality within the drainage areas of the plan.

Issue 4. Focus on wetland functions and uses that best implement WRMP goals.

The WRMP goals were reviewed to identify those that focus on wetland functions. The results are shown below in Chart 2.2-2. Wetland functions are shown as shaded headings listing one or

more functions. The WRMP numbered goals are listed under each heading. Goals can encompass several wetland functions. Some functions are not addressed in WRMP goals. Functions related to hydrology of wetlands taken together address six of twelve watershed goals. The wetland values of Aesthetics/ Recreation/ Education/ Cultural meet four of the twelve watershed goals or another 25% of the watershed goals. Taken together, these two groups, wetland values and hydrologic functions, are important to three quarters of the watershed goals. This outcome is worth noting while reviewing Section 3.1 of this Wetland Plan and the results of the public opinion survey conducted on values of wetlands. The priority wetland functions should be those that most accomplish overall watershed goals.

Chart 2.2-2. WRMP Goals and Best Fit to Wetland Functions Evaluated for the Wetland Plan.

Vegetative Diversity/Integrity
No WRMP goals identified
Maintenance of Characteristic Hydrologic Regime; Flood/Stormwater/Attenuation; Downstream Water Quality
1. To minimize new discharge of stormwater from the District. Maintain design discharge capacity of Prior Lake outlet. Manage runoff volume to minimize volume increases.
2. To protect the District's rights and capacity of the Prior Lake Outlet Channel. Continue to exercise rights set forth in the Joint Powers Agreement/Memorandum of Agreement executed in October 2006 and other present and future agreements so executed or amended.
4. To maintain or improve water quality within the District. Achieve and maintain pollutant load levels at or below standards as dictated by Federal and State Impaired Waters threshold levels in the lakes within the District.
5. To obtain quantitative data to better manage water quantity and quality issues. Maintain monitoring stations and parameters on designated water bodies as established in monitoring plans.
7. To minimize erosion and, when it occurs, retain the sediment upland and on-site. Coordinate site inspection with other government entities.
9. To maintain existing conveyance routes. Monitor condition and perform needed maintenance as required to maintain conveyance and discharge capacity. Secure conveyance routes via easements as properties develop.
Maintenance of Wetland Water Quality/Shoreline Protection/Maintenance of Characteristic Wildlife Habitat
11. To fully understand the character and condition of all wetlands in the watershed for the purpose of resources planning, restoration and permitting. Build on previous efforts to complete an inventory and function and values assessment of all wetlands in the watershed. The functional assessment shall inform District efforts to restore and/or enhance wetlands and the values assessment shall be informed by local government values. Participate where possible in the sequencing review process.
12. To restore, enhance and/or preserve wetlands or partially drained wetlands which provide natural attenuation of runoff volumes, improve water quality and provide fish and wildlife habitat. Perform wetland restoration projects in the District.
Maintenance of Characteristic Fish Habitat; Maintenance of Characteristic Amphibian Habitat
No WRMP goals identified
Aesthetics/Recreation/Education/Cultural
3. To plan for future development and redevelopment and optimize the quality of life by minimizing problems with water and land resources. Require and conduct review of local plans, rules, and ordinances which anticipate future water resource needs within two years of plan approval.
6. To reduce, to the greatest extent practical, the public expenditures needed to manage surface water. Revise rules to allow for regulatory coordination, carry out inventory efforts and prioritize District programs to coincide with upcoming governmental projects. Cost and benefits weighed comprehensively prior to pursuing project.
8. To seek opportunities to integrate recreational, wildlife, and open space benefits on projects initiated or partnered on by the District. Continue partnering with local government entities to maximize established land management programs and to acquire easements over priority land areas.
10. To serve as a central resource for local water resource information in the District. Maintain a collection of information, reports and reference material for use by stakeholders. Convene periodic technical and citizen advisory committee meetings to discuss issues.
Commercial Uses
No WRMP goals identified
Groundwater Interaction
13. To cooperate with governmental units and other organizations to promote infiltration and groundwater recharge. Promote and support regional infiltration and groundwater recharge projects in cooperation with local governments.

Summary of Issues Identification

The overarching theme of issues identification is to develop a plan that examines wetlands in the context of other water and natural resources. In other words this is known as integrated resource management (IRM). Financially and ecologically, IRM ties together wetlands with other aquatic resources and their management, terrestrial resources, and overall community planning intentions. IRM thus eliminates redundancy in government planning and projects and demonstrates multiple outcomes for the same projects developed and dollars spent. IRM addresses the WRMP Goal # 6, *"To reduce, to the greatest extent practical, the public expenditures needed to manage surface water. Revise rules to allow for regulatory coordination, carry out inventory efforts and prioritize District programs to coincide with upcoming governmental projects. Cost and benefits weighed comprehensively prior to pursuing project."*

2.3. Supporting Planning Studies/Documents

In addition to the WRMP, the activities of the PLSLWD are represented by additional studies and plans described below. The CWP and other studies of the District will complement each other and provide supporting data through effective project coordination. In practice, anticipated outcomes of the CWP will be met by coordinated implementation of several plans, not just the CWP.

Upper Watershed Review and Assessment Technical Memo. 2010.
This technical memo provides useful guidance for estimating stormwater volume reduction resulting from wetland restoration activities. Both drained and undrained basins were evaluated. The following guidance is provided:

- Drained Wetland Restoration: For drained wetlands, primarily drain tiled agricultural depressions, the benefit is modeled by changing the land cover from agricultural crops (average of good/poor row crops for all soil groups) to a wetland with less than 1/3 open water.
- Undrained Wetland Restoration: For undrained wetlands, vegetative enhancement is estimated to occur at a rate differentiating open water evaporation and evapotranspiration of water in a semiwet wetland. The total benefit for undrained wetland restoration is estimated to be 3.3 inches per year in addition to pan evaporation rates for open water, as determined through extensive literature search.

Upper Watershed Runoff Volume Reduction Study. 2011-12 This project will have the potential to provide more detailed information about the hydrology of wetlands in the study area. Monitoring data collected on implemented projects can be used to validate or update design and modeling assumptions for future stormwater management projects.

Lower Prior Lake Diagnostic Study. This plan, initiated in 2011, will include a watershed assessment and water quality model of the drainage area, and thus provide possible opportunity for more detailed information about the hydrology of wetlands in this drainage area.

Storage and Infiltration Study. 2004.
In this report, the District inventoried potential regional infiltration opportunities. Infiltration was not identified as very suitable for this drainage area; however, many potential sites were identified for storage. These areas primarily included topographic low points (in some cases wetlands) and were prioritized using established parameters.

Spring and Upper Prior Lake TMDL. 2011.

In 2002, Spring Lake and Upper Prior Lake were listed on Minnesota's 303(d) List of Impaired Waters for nutrient/eutrophication biological indicators. A combination of individual and categorical Waste Load Allocations (WLA) were set for the regulated sources. The regulated sources include the City of Prior Lake, Spring Lake Township, Scott County, the Minnesota Department of Transportation (MnDOT), and construction and industrial stormwater. A categorical WLA is provided for the City of Prior Lake, Spring Lake Township, Scott County, construction stormwater, and industrial stormwater, and an individual WLA is provided for MnDOT.

Spring and Upper Prior Lake TMDL Implementation Plan. 2012.
The PLSLWD will lead the coordinated effort to improve the water quality in each lake. Multiple partners will provide guidance and implement actions, as appropriate, as outlined in this implementation plan. The PLSLWD will coordinate and lead meetings with implementation partners. The PLSLWD will work closely with a core group of partners on data collection and project implementation.

Scott County Rural Residential Service Area Detailed Area Plan: Assessing the Cumulative Impacts of a Long-term Rural Service Area. December 22, 2009. Scott County Community Development Division. This is commonly known as the DAP Study. From a fiscally prudent perspective the plan examines "urban growth boundaries", clustering development, and creating future patterns that permanently preserve defined Natural Area Corridors and unique environmental features. All of which are concepts associated with Low Impact Development. The DAP covers portions of Spring Lake Township within PLSLWD. For implementing the DAP, the County has developed a wide variety of cluster development zoning standards, and policies for Planned Unit Development (see Scott County Property Zoning Information). Zoning Map:

3. INCORPORATION OF PUBLIC VALUES

3.1. PLSLWD Public Values Survey Summary

What Are Values Related to Wetlands?

Public value of wetlands is defined by the WCA to mean, "the importance and benefit to the public derived from [the] wetland functions."

WCA lists the following Functions and Uses of Wetlands:

A. water quality, including filtering pollutants to surface water and groundwater, using nutrients that would otherwise pollute public waters, trapping sediments, protecting shoreline, and recharging groundwater;

B. flood water and storm water retention, including the potential for flooding in the watershed, the value of property subject to flooding, and the reduction in potential flooding by the wetland;

C. public recreation and education, including hunting and fishing areas, wildlife viewing areas, and nature areas;

D. commercial uses, including wild rice and cranberry growing and harvesting and aquaculture;

E. fish, wildlife, and native plant habitats;

F. low-flow augmentation; and

G. other functions and public uses as identified in wetland evaluation methods demonstrated to reasonably identify appropriate candidates for wetland replacement.

Public Values for Wetlands in PLSLWD

During the time period of February 15 - March 24, 2011 the PLSLWD received 55 responses to a wetland public values survey. The survey was posted online and the request to respond to the survey was included in a newspaper article, posted on PLSLWD's website and verbally communicated at a public meeting. The public values survey questions were designed to inform the CWP on the functions and uses of wetlands most important to the represented public. The results are summarized here, based upon the complete set of questions and responses in Section 7.3 of this Plan.

Responders were asked to rank the eight wetland functions and uses in the survey. The results are shown below in Chart 3.1-1. Groundwater and surface water quality ranks as the two most highly valued functions and uses.

Chart 3.1-1. Public Priorities for Wetland Functions and Uses Ranked Highest to Lowest Value.

Wetland Function and Use	Cumulative Value of Rankings
Surface Water Quality	320
Wildlife Habitat	320
Groundwater Quality	312
Flood Prevention	225
Wetland Aesthetics	222
Ecological Diversity	217
Recreation/Education	210
Commercial	148

Responders were also asked their general opinion of wetlands and community planning, with consideration of wetland value/importance/focus in future planning and development. Of the 55 responses, the following outcome clearly indicates that the responders find wetlands valuable and ought to be a major focus in community planning.

Chart 3.1-2. Public Priorities for Wetlands as Part of Community Planning.

Extent of Wetlands Focus in Future Development	Public Priority (breakdown of 55 respondents)
Inherent value/major focus, regardless of their utility for humans	21
Valuable due to their beneficial functions/major focus	21
Valuable/not a major focus	10
Some value/low importance/no focus	3

3.2. Strategies to Address Input

The results of the public values survey were used to prioritize wetland functions for decisions related to management and permitting and emphasize WRMP goals that affect wetland functions. The more important wetland functions and WRMP goals are identified below.

The public survey finds that wetlands are valuable and should be a major focus of community planning. The public values survey results show that the more important wetland functions are:

Surface Water Quality
Wildlife Habitat
Groundwater Quality

Section 2.2 of this CWP shows the relationship of WRMP goals to all wetland functions. Taking into consideration the priorities of the public, six of thirteen WRMP goals speak to the more important wetland functions. These WRMP goals are listed below, with bold-typed key phrases that are related to wetlands. District wide projects related to these WRMP goals should thus include a priority for the above listed wetland functions.

<u>Six WRMP goals that support the highest valued wetland functions:</u>

4. To **maintain or improve water quality** within the District. Achieve and maintain pollutant load levels at or below standards as dictated by Federal and State Impaired Waters threshold levels in the lakes within the District.

5. To **obtain quantitative data to better manage water quantity and quality** issues. Maintain monitoring stations and parameters on designated waterbodies as established in monitoring plans.

8. To seek opportunities to **integrate recreational, wildlife, and open space** benefits on projects initiated or partnered on by the District. Continue partnering with local government entities to maximize established land management programs and to acquire easements over priority land areas.

11. To fully understand the **character and condition of all wetlands** in the watershed for the purpose of resources planning, restoration and permitting. Build on previous efforts to complete an inventory and function and values assessment of all wetlands in the watershed. The functional assessment shall inform District efforts to restore and/or enhance wetlands and the values assessment shall be informed by local government values. Participate where possible in the sequencing review process.

12. To **restore, enhance and/or preserve wetlands** or partially drained wetlands which provide natural attenuation of runoff volumes, improve water quality and provide fish and wildlife habitat. Perform wetland restoration projects in the District.

13. To cooperate with governmental units and other organizations to promote **infiltration and groundwater recharge**. Promote and support regional infiltration and groundwater recharge projects in cooperation with local governments.

Relationship of Values Survey to WCA Rules and MnRAM Functions and Uses Evaluated for this Plan. The public values survey finds the following functions and uses as defined in the WCA Rules, to be more important:

> A. water quality, including filtering pollutants to surface water and groundwater, using nutrients that would otherwise pollute public waters, trapping sediments, protecting shoreline, and recharging groundwater;
>
> E. fish, wildlife, and native plant habitats.

Likewise, the public values survey results were used to prioritize MnRAM functions. All MnRAM functions evaluated for this plan are listed below, but only those found to have high public value are underlined.

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

Additional Evaluation Information

1. Restoration Potential

Functions of high importance in the City of Prior Lake's Local Surface Water Management Plan include "Maintenance of Hydrologic Regime" and "Flood/Stormwater Attenuation". Although these two did not score highest on the public values survey, they are also important wetland functions to the PLSLWD and were considered in the development of the wetland management classifications.

4. PRESERVATION/ENHANCEMENT OF WETLAND FUNCTIONS & USES

The TEP considered ways to identify sites for preserving, enhancing, or restoring wetland functions at Meeting #2. The recommendations are listed below.

- ✓ Utilize the results from the citizen surveys to prioritize the functional benefits of the wetlands.
- ✓ The classification categories of the wetlands can be built upon water quality treatment, stormwater storage, the Scott County's corridor study or other factors.
- ✓ Initial prioritization should be based upon providing improved water quality.
- ✓ Prioritizing the plan will provide a good framework for future work.
- ✓ A proactive approach towards restoration may be an easier path than establishing tougher regulations for development. It would be easier to get projects on the ground ahead of development.
- ✓ Detailed Area Planning (DAP) has shown that development is a way to improve water quality.
- ✓ It may be possible to create a system for replacement within the District. Utilize development dollars to augment projects funded by public money.
- ✓ If the District wants to keep mitigation within its boundaries, it may want to create a banking system.
- ✓ The functional priority of the wetlands in the study should be able to be adjusted if there are changes. A wetland might move up or down in the list depending on local changes.

The data for identifying preservation and restoration sites comes from the WRMP goals (Section 2.2), public values survey results (Section 3.2), and local wetland inventory and assessment findings (Section 7.0). Information to identify these sites can also come from examining the WRMP for potential contributors[2] to reduced wetland water quality and hence function.

[2]From the 2010 WRMP: Currently operating feedlots are subject to field inspections and given surface water pollution potential ratings of high, medium, or low relative to the number of animals present, current condition of the feedlot, land slope, and proximity to surface water bodies. The number of feedlots in the District has decreased from 18 feedlots in 1999 to 11 feedlots in 2008.

A search was conducted via the US EPA Enforcement and Compliance History Online database and 65 sites were identified. This search included auto salvage facilities, hazardous waste sites, medical facilities, and other facilities holding permits to generate, emit, discharge or handle pollutants. Auto salvage yards, machine shops, and medical facilities are the most common and are frequently sources of heavy metals such as lead, zinc, copper, and chromium as well as oil and grease.

A study of HEL soils was conducted by the watershed in cooperation with Scott SWCD in 1993 as part of the Prior Lake-Spring Lake Diagnostic/Feasibility Study. This study found that approximately 3,410 acres of 14,550 acres evaluated were potentially highly erodible. This corresponds to approximately 23 percent of the southern watershed. The allowable soil loss, or T factor, as specified by Scott SWCD is 5 tons/acre/year.

4.1. High Priority Resource Preservation

In accordance with WCA Rules, the CWP may identify local preservation criteria or sites based upon the WRMP goals (Section 2.2 of this Plan) and high public values (Section 3.2 of this Plan). The WCA prioritizes protection of wetlands in minor watersheds that have less than 50 percent of their original wetland acreages and wetlands that are at risk of degradation or loss because their protection is integral to maintaining the ecological health of the watershed. The high priority areas can be for preservation, enhancement, restoration, and establishment.

Wetland functions of high public value (see Section 3.2 and listed below) were sorted according to functionality as high, medium, low. All wetlands scoring high for one of the following functions were given a high priority for wetland resource preservation (see Map 4.1-1).

- Maintenance of Characteristic Vegetative Diversity/Integrity
- Downstream Water Quality
- Maintenance of Wetland Water Quality
- Maintenance of Characteristic Wildlife Habitat Structure

Map 4.1-1 presents the 2011 high priority preservations sites. As new data become available maps would be updated and provided in the annual reporting requirements (see Section 5.4 of this Plan). This map does not include ground water interaction or data on rare species (see Section 6.2 of this Plan) records for the Blanding's turtle and red-shouldered hawk wetland-upland habitat complexes.

4.2. Prioritization of Restoration Sites

The CWP identifies restoration/replacement sites based upon inventories of historic and existing wetland resources, including identification of degraded wetlands, existing high-quality wetlands, and immediate and long-term resource needs; an analysis of the types and locations of replacement projects that will provide the desired wetland functions, benefit the watershed from a landscape perspective. Priority is given to naturally self-sustaining replacement that best achieves watershed goals and improves the ecological condition of the watershed.

Restoration sites were identified using a methodology for prioritizing and ranking wetland restoration sites for the Upper Watershed Volume Reduction Project.

Background

The PLSLWD was awarded a BWSR Clean Water Fund (CWF) grant for the Upper Watershed Volume Reduction project. The District has also leveraged Wetland Reserve Enhancement Program (WREP) dollars to implement the projects. Each of these programs has specific eligibility requirements. This methodology determined specific site eligibility under the two programs and provided a quantitative approach to ensuring that among the eligible sites, the most cost effective and beneficial projects are implemented. This methodology was also used to inform this Prioritization of Restoration Sites for this CWP.

Methodology Used:

Step 1. Potential Site Evaluation

The first step in the process was to utilize documentation and GIS information from previous efforts. Those data sets included:

- April 22, 2010 PLSLWD Upper Watershed Review & Assessment Technical Memo, EOR
- December 2004 PLSLWD Watershed Storage and Infiltration Study, Wenck

- PLSLWD wetland MnRAM Database (which includes previously developed Scott County Wetland Inventory coverages)
- Scott County Soil Survey - Hydric Soils = Base layer of all potential basins

Step 2. Restoration Potential Determination
This step involved determining the "restoration potential" using several data sources. The PLSLWD CWP originally rated the potential for hydrologically restoring inventoried basins based on pre-established BWSR MnRAM protocol. Also, the original Scott County Wetland Inventory database contains notes on some of the drained basins pertaining to the ease of restoration that will be utilized in this step. An additional GIS exercise was performed to determine the number of restorable acres per landowner for the entire basin. This numeric value guided the outreach prioritization process detailed in Step 4.

Step 3. Relative Benefit Determination
This step involved determining the relative benefit of each site. This was accomplished by an evaluation that included area of the site (which served as a surrogate for volume retention and P removal), MnRAM scores for water quality, and field notes on infiltration potential.

Step 4. Outreach Prioritization
To guide initial landowner outreach, all potential basins were scored consistent with BWSR CWF Runoff Reduction Grant goals (i.e. basins were prioritized based on potential to reduce stormwater runoff and retain water on the land to reduce the movement of sediment, nutrients and pollutants). Practices should accomplish restoration, protection or enhancement of water quality in lakes, rivers and streams and/or protect groundwater and drinking water. This step involved attributing the GIS database with unique metrics for all potential basins and scoring for each of the parameters. The following metrics were utilized for outreach prioritization:

1. **Volume Reduction Benefit**. Basin identified in "December 2004 PLSLWD Watershed Storage and Infiltration Study" (Basins in Priority Infiltration Sites = 2, Basins in Potential Infiltration Sites = 1, Other = 0) [WENCKINF]
2. **Volume Reduction Benefit**. Basin identified as a "Drained" basin in the PLSLWD MnRAM Database (YES = 2, NO = 0) [DRAINED]
3. **Restoration Potential**. Basin was identified in the PLSLWD MnRAM Database as having a "HIGH" rank for Restoration Potential (High = 2, Medium = 1, Low = 0) [RESTOHIGH]
4. **Restoration Potential**. Basin identified in the Scott County Soil Survey as containing historically Hydric Soils (YES = 1, NO = 0) [HYDRIC1]
5. **Stacked Goals**. Basin is contained within a Scott County Natural Areas Corridor (YES = 2, NO = 0) [CORRIDOR]
6. **Landowner Involvedness**. Restorable acres per landowner score (>5ac per landowner =2, <5ac per landowner = 0) [LANDOWNER]
7. **Single-Landowner Bonus**. Basin is owned by a single landowner (YES = 2, NO = 0) [ONEOWNER]

The results of this 2011 restoration priorities analysis are displayed on Map 4.2-1. As new data become available, the mapping database will be updated.

4.3. Sequencing Standards

This CWP does not vary the WCA sequencing standards. After discussions with and input from TEP members and stakeholders, it was concluded that current Federal and State sequencing requirements adequately achieved desired outcomes for this CWP. Therefore, no modification to sequencing standards is proposed.

4.4. Replacement Locations and Standards

This CWP will match current Federal and State required sequencing, and follow a minimum acreage requirement of two acres[3] of replaced wetland for each acre of impacted wetland requiring replacement.

The TEP will review proposed replacement plans for no net loss of public value within the area subject to the plan. The first priority is for onsite functional replacement, and the second priority is for replacement within the Watershed District. If on-site replacement is deemed non-feasible, wetland replacements and mitigation can be sought using the WCA sequencing and wetland banking, however wetland functions impacted must be replaced onsite by utilizing appropriate stormwater management BMPs and ecological restoration practices.

Priority is given for wetland replacement activities that restore and enhance existing degraded wetlands, and reestablishment of wetland in former wetland basins not currently meeting jurisdictional status. Creation of wetland in upland areas is given lowest priority.

4.5. Proposed Functions Based Wetland Management Classes

Establishing wetland management classes as part of a wetland planning process is an important component to meeting local resource management objectives. Work completed to date on the PLSLWD CWP includes an inventory of wetlands, functional assessment, identification of high priority wetlands for restoration potential and preservation, and public survey on importance or value of wetlands functions and uses. Local planning efforts have identified the key function wetlands have in flood protection. Taken together, all of this information provides the basis for establishing management classes for wetlands in the PLSLWD.

Management class standards shall serve as guidance for decisions on all land use activities throughout the watershed that may affect wetland functions. This includes decisions related to the following actions:

- Wetland permitting - Setting conditions for permits.
- Stormwater Management. – Development of local plan goals and policies, reviewing capital implementation projects, and proposed developments.
- Flood Prevention and Water Quality Projects – Development of capital implementation projects.
- Parks and trails planning – Coordination of public open space with wetland protection.
- Transportation planning – Providing suitable replacement for unavoidable impacts.

Of high value to the public in the plan area are the service wetlands provide related to groundwater recharge, surface water protection and wildlife habitat. In addition, habitat quality based on vegetative quality is also an important function of wetlands. An additional component of PLSLWD's wetland inventory and analysis are priority areas for restoration and/or enhancement. These highly valued services provide the basis for describing the three management classes below.

Wetlands shall be assigned to one of these management classes (presented in no particular order). If a wetland meets classification standards for more than one management class, the most restrictive standards shall apply. Standards proposed are based on recommendations derived from MnRAM and the Storm Water Advisory Group's (SWAG) bounce and inundation recommendations for wetlands.

[3] The minimum for counties within the less than 50 percent area of presettlement wetlands remaining.

1. Hydrology Management Class

The plan addressed Hydrology Management through assessment of the following wetland functions:

- Downstream Water Quality
- Groundwater Interaction

These are also the wetland functions of highest priority according to the public values survey. Data analysis provided a score of high, medium, or low for each function assessed. For any wetlands scoring "High" or "Exceptional" for either of these functions, they would be assigned a "Hydrology" Management Class. Appendix A shows Map 4.5-1: Wetlands with Hydrology Management Class.

2. Natural Areas Management Class

The plan addressed Natural Areas value through assessment of the following wetland functions:

- Maintenance of Characteristic Vegetative Structure/Integrity
- Maintenance of Characteristic Wildlife Habitat Structure

Data analysis provided a score of high, medium, or low for each function assessed. For any wetlands scoring "High" or "Exceptional" for these functions, they would be assigned a "Natural Areas" Management Class. These scores were evaluated in conjunction with the Scott County natural areas corridor locations as well, because an important component of habitat function is the connectivity between wetland habitats and wetland and upland habitats. Appendix A shows Map 4.5-2 Wetlands with Natural Areas Management Class.

3. Restoration/Enhancement Management Class

These scores were evaluated in conjunction with wetland assessment data on restoration potential and PLSLWD assessment of the upper watershed for retention, storage, and infiltration of precipitation. Some sites of wetland restoration potential are lands that currently lack wetland hydrology as a result of prior alteration and drainage. Any wetlands/basins that were ranked for high priority for restoration would be assigned a "Restoration/Enhancement" Management Class. Appendix A shows Map 4.5-3: Basins with Restoration/Enhancement Management Class.

4.6. Proposed BWSR MnRAM Basic Protection Classes

For all wetlands not assigned to the "Functions Based Wetland Management Classes" BWSR's Basic Protection standards apply. BWSR's MnRAM protocol has a "Recommended Wetland Management Classification System" which takes wetland functional rankings and creates a single Management Classification system ("Preserve," "Manage 1," "Manage 2," and "Manage 3"). Recommended standards for all wetlands in the Basic Management class most closely match the BWSR MnRAM-identified "Manage 2". These standards along with SWAG's were used to define recommended standards.

4.7. Cumulative Buffer Averaging

In addition to management class standards, cumulative buffer averaging shall be applied to development site plan review to maximize the area of connected wetland and buffer on a cumulative basis for the whole site, including connections to offsite natural areas and wetlands.

The cumulative buffer area for the development shall be calculated using the minimum or mid-range width for the management class of each wetland (assigned according to the site-specific MnRAM results). The dimensions of the buffer may be adjusted by the LGU during application review based upon the quality of the wetland and public waters, local topographic conditions and the type and design of development being proposed.

Chart 4.4-1. Recommended Wetland Management Standards, PLSLWD Wetland Plan

Management Class	Wetlands		MnRAM Functions of Value (High/Exc)	Management Strategy	Mitigation Standard Recommendations	Buffer Recommendations (monuments required)	Hydrologic Guideline Recommendations
	Number	Acres					
Hydrology Management	89	248	Downstream Water Quality Groundwater Interaction	Maintain existing hydrologic functions or increase in accordance with upper watershed priorities.	WCA minimum or greater replacement ratio with documented replacement of functions/values. Replacement of functions and values on site or in location specified in plan for restoration.	Use 35-50 feet average with vegetation consisting of unmowed grassland species optimal for maximizing roughness. Pervious trails and stormwater features incorporated into buffer are counted in average area.	*Bounce*: Existing + 0.5 feet *Inundation:* *(2 yr):* Existing + 1 day *(10 yr)*: Existing + 7 days *Runout Control*: Moderate adjustments to enhance hydrologic function.
Natural Areas Management	23	506	Vegetative Structure/ Integrity Wildlife Habitat Structure	Maintain existing wetland classification type. Maintain or enhance ecological functions of wetland.	WCA minimum or greater replacement ratio with documented replacement of functions/values.	Use 50-100 feet variable width consisting of unmowed naturalized vegetation. Pervious trails incorporated into buffer are counted in average area.	*Bounce*: Existing *Inundation* *(2 yr):* Existing *(10 yr)*: Existing *Runout Control*: Maintain existing hydrology.
Restoration/ Enhancement	124	482	Restoration Potential	Restore or enhance existing wetland functions and/or creation of projects with potential to provide wetland functions.	WCA allows mitigation flexibility with minimum standards required in the plan area, see M.R. 8420.0650.	Establish a 25-35 feet average buffer consisting of unmowed grassland species optimal for maximizing roughness. Pervious trails and stormwater features incorporated into buffer are counted in average area.	*Bounce*: No Limit *Inundation* *(2 yr):* Existing+7 days *(10 yr)*: Existing+21 days *Runout Control*: 0 to 4.0 ft above existing runout elevation.
Basic Management Class	479	2,270	None Specified	Maintain wetland function	WCA allows mitigation flexibility with minimum standards required in the plan area, see M.R. 8420.0650	A buffer shall be provided for all affected wetlands with a minimum width of 16.5 feet and an average width of 25 feet. Stormwater features adjacent to wetlands may be included in the buffer width calculations..	*Bounce*: Existing + 1.0 feet *Inundation* *(2 yr):* Existing + 2 days *(10 yr)*: Existing + 14 days *Runout Control*: Enhance hydrologic function

5. COMPREHENSIVE WETLAND PLAN IMPLEMENTATION PROCESS

5.1. PLSLWD Administrative Process

The PLSLWD has committed resources to preparation and implementation of the CWP in accordance with its WRMP. The WRMP identified the need for a CWPMP and this project was initiated as such. The PLSLWD assembled a TEP that provided input throughout the process and influenced the decision to pursue a CWP through the local planning process rather than a CWPMP through the BWSR approval process. The TEP will be consulted in future implementation phases of the CWP. The PLSLWD Board of Managers will adopt the CWP as a resource management plan of the PLSLWD. The priorities for preservation and restoration will be used by PLSLWD in coordination with other studies and plans to implement projects that can meet multiple WRMP goals. The recommended standards found in this CWP will provide basis for future PLSLWD Rule development. The wetland data generated for this plan will be a useful tool for Scott County WCA LGUs for WCA permitting decisions and other local wetland initiatives.

5.2. LGU & TEP Administrative Process

For administration of wetland rules, this plan shall provide tools listed below for decision-making by the WCA Local Government Unit (LGU) and Technical Evaluation Panel (TEP).

Chart 5.2-1. PLSLWD Wetland Plan Watershed-wide Tools for WCA TEP and LGU Use.

- Inventory of wetland locations and updated mapping
- Assessment of functions and uses and database
- Restoration priorities assigned to management class standards
- Preservation priorities assigned to management class standards

PLSLWD will identify potential implementation projects (such as in Section 2.4) and request TEP advisory meetings for recommendations.

The WCA TEP and LGU were involved in preparation of this plan and are listed below. The TEP is advisory to all LGUs in Scott County.

Chart 5.2-2. WCA TEP and LGU Members in the PLSLWD.

Entity	Contact Person	Group
– City of Prior Lake	Ross Bintner	LGU and TEP
– City of Savage	Jon Allen	LGU
– City of Shakopee	Joel Rutherford	LGU
– Spring Lake Township	Kathy Nielson or Ben Meyer	LGU
– Sand Creek Township	Paul Nelson	LGU
– Scott County	Troy Kuphal	LGU and TEP
– MN BWSR	Ken Powell	TEP
– MN DNR	Jeff Berg	TEP
– USACE	Michael Setering	TEP

5.3. Other Stakeholder Roles

In accordance with WCA Rule 8420.0830 Subp. 6. A, the WRMP stakeholders consist of those invited to meetings during the development of the plan and Draft Wetland Plan review. The

stakeholder organizations listed below were invited to participate and are in addition to the WCA LGU stakeholders listed in Section 5.2.

Chart 5.3-1. WCA Stakeholders Invited to Participate in the Wetland Plan.

– Sand Creek Township – Shakopee Mdewakanton Sioux Community – Lower Minnesota River WD – Metropolitan Council	– MN Dept. of Agriculture – MN Dept. of Health – MN Dept. of Transportation – MN Pollution Control Agency

These entities can best support the CWP by identifying inconsistencies between WRMP and CWP activities, potential overlap with their programs and projects, and opportunities for collaboration in project development and funding.

5.4. Annual Evaluation of CWP

WRMP activities, which may have various degrees of overlap with the CWP, are listed below.

- ✓ Identify regulated areas and potential easements or land acquisition areas;
- ✓ Outline procedure for submitting annual reports to agencies which document Wetland Conservation Act and monitoring program data consistent with state compatibility Guidelines;
- ✓ Set forth an implementation program, including a description of official controls, inspection and program maintenance, and a capital improvement plan;
- ✓ Describe official controls and the responsible unit of government in the following areas: wetlands, erosion control, shoreland, floodplain, grading, and drainage;
- ✓ The Local Plan must identify potential capital projects for which District cost-share will be sought, and projects the LGU may petition the District to complete;
- ✓ The Local Plan must recognize and incorporate District wetland priority areas identified via completion of functions and values assessments and the District's planned Wetland Plan.

The CWP annual evaluation will include the items listed above from the WRMP activities, along with these additional items categorized by LGU.

- ✓ Gains or losses in wetland acreages by impacts, replacement plans, and mitigation banks;
- ✓ Actions that required wetland permit application forms;
- ✓ Actions that required exemption and no loss reporting;
- ✓ Wetland monitoring activities.

Additionally, the annual evaluation will describe actions taken to implement priorities for wetland preservation and enhancement.

5.5. Implementation of CWP Recommended Standards

The standards developed as part of this CWP will be implemented through Watershed District Rule G. For activities that impact wetlands, a permit from the District will be required. The District encourages entities considering projects that impact wetlands to contact District staff early in the planning process. The District can provide assistance throughout the process to ensure the permitting delays are avoided to the greatest extent possible.

The permitting process will be most efficient if the applicant contacts PLSLWD to determine if the proposed project requires a permit. In such case a permit is required, the applicant will be advised to follow this stepwise process:

1. Delineate and conduct MnRAM on existing wetlands.
2. Review and concurrence from PLSLWD is advised before proceeding to next step.
3. Use updated MnRAM or existing CWP data to determine appropriate classification for each wetland basin on site.
4. Applicant considers buffer and hydrologic standards proposed for each wetland.
5. Address sequencing requirements for any impacts proposed.
6. Calculate required buffer area and utilize allowable buffer averaging standards to enhance wetland function and provide some flexibility in site design
7. Design site with appropriate standards in place and conduct a MnRAM on proposed site conditions.
8. Review and concurrence from PLSLWD is advised before proceeding to next step
9. Demonstrate project proposal meets wetland mitigation requirements and preservation of wetland function. This step should include the preparation of the final application and with some assurance that PLSLWD staff will be recommending approval that wetland and buffer standards will be met.
10. Implement project activities and establish required buffers according to standards proposed in Chart 4.4-1 and protected by a conservation easement or outlot.
11. Monitor mitigation areas per WCA and perform necessary maintenance on mitigation activities as applicable.

6. PROJECT AREA DESCRIPTION

Section 6.0 summarizes and is consistent with the characterization of the PLSLWD area that is provided in the WRMP.

6.1. Land Use

The PLSLWD includes approximately 42 square miles of area located entirely within Scott County, Minnesota. The City of Prior Lake and Spring Lake Township comprise most of the District's area, while Sand Creek Township and the cities of Shakopee and Savage have relatively little land area within the District. The PLSLWD is bordered by the Lower Minnesota River Watershed on the north, and the Scott County Water Management Organization (WMO) on all other sides.

Population estimates for Scott County by the Metropolitan Council and State Demography Unit estimate the 2007 population as 123,735 people. From the Scott County Census 2010 results, the population increased to 129,928 people. Utilizing the same census results, the estimated population within the PLSLWD in 2010 was 27,432 people.

Urban developments are primarily residential units located adjacent to the lakes with some commercial and industrial development primarily occurring along Highway 13 through the City of Prior Lake. The predominant residential land use is single family residential units with portions of the area zoned as permanent rural residential. Commercial and industrial land use in the watershed is comprised of warehousing, residential services, and office space. Rural land use is primarily comprised of small to medium sized farms with the average farm size being about 150 acres. The major farming activities include row crop production of corn and soybeans along with a few cattle grazing in pastures. The agricultural areas of the District are primarily located in the southern part of the District away from Prior and Spring Lakes and outside the Metropolitan Urban Service Area (MUSA).

6.2. Ecology

The PLSLWD lies within the North Central Hardwood Forest Ecoregion, and more specifically, the Big Woods subsection. This region is defined by a single landform that was once dominated by oak woodland and maple-basswood forests. Few remnants of the original vegetation remain as a result of agricultural and urban development.

Historical wet prairies, or wet meadows, were found in two bands running south from Spring Lake. These wet prairies generally followed major natural drainage features that still exist today: County Ditch 13 and the Buck Lake Channel. The aquatic wetland community within the wet prairie areas was one of the most complex and diverse communities in the region. Wetlands represented in these areas represented a variety of hydrologic regimes from seasonally inundated wet meadows (Type 1 wetlands) to Lakes (Type 5 wetlands). The variation in hydrologic regimes is mirrored in the plant community with wetland plants ranging from facultative wetland plants that grow near wetland boundaries, to obligate wetland plants such as cattails and floating and submerged aquatic vegetation.

The southwestern portion of the watershed includes Swamp Lake, Sutton Lake, Fish Lake and Buck Lake. This region is drained primarily by County Ditch 13 for Swamp and Sutton Lakes and by the Buck Lake channel for Fish and Buck Lakes. These channels discharge to Spring Lake, which discharges to Upper Prior Lake, which in turn discharges to Lower Prior Lake.

Emboidea blandingii, the Blanding's turtle typically prefers shallow wetlands with adjacent uplands for nesting. It is likely that this species inhabits the marshes within or adjacent to Murphy-Hanrehan Park (which is near, but not within the geographic boundary of the PLSLWD) and utilizes the forested uplands during the nesting season. Other potential locations include wetlands near the northeastern shore of Upper Prior Lake. The red-shouldered hawk requires large forested tracts (about 500 acres) interspersed with small marshes and wet meadows for breeding. Conservation actions to minimize the disturbance of the remaining forest/wetland complex southeast of Prior Lake are recommended by MN DNR to protect the breeding habitat of this rare woodland hawk. There is also a small Sphagnum rich fen located west of Highway 13 between County Roads 16 and 42.

6.3. Geologic Setting and Hydrology

The surficial geology of the District is almost entirely comprised of glacial till deposits. The only surficial geological unit of any other origin is a few small regions of peat deposits. Glacial till and drift were brought to the region through a series of glaciations coming from the northeast and the northwest. The Superior lobe came from the northeast bringing reddish-brown drift, eroded from the bedrock of the Superior region. Glaciers coming from the northwest brought gray clayey, calcareous drift eroded from North Dakota, Manitoba, and Northwestern Minnesota. The hills, ridges, and kettle lakes of the region were formed when the Des Moines Lobe began to stagnate and melt. This resulted in the creation of the irregular topography of the region. Six major soil associations have been identified in the District.

Snow and rainfall data for the District is obtained from a weather station at Jordan, Minnesota. The water elevation of Prior Lake has ranged from a recorded low of 883.6 in 1938 to a recorded high of 907.6 in 1906. This can be considered as a historical benchmark for potential water table fluctuation in area wetlands as well. To supplement the existing data on lake levels and flow, several hydrologic models have been developed for the District. These models can be used to make predictions regarding future water levels and flow rates in the District.

7. WETLAND INVENTORY AND ASSESSMENT

7.1. Wetland Inventory

Past and Previous Inventories

A detailed map and inventory list of DNR protected wetlands can be found in the 1996 DNR publication "Protected Waters and Wetlands, Scott County, Minnesota". Permits are required from the DNR for any alteration of protected wetlands or waters below the ordinary high water elevation. DNR protected wetlands are defined in M.S. 105.37 as "all Type 3, 4, and 5 wetlands, as defined in United States Fish and Wildlife Service Circular No. 39 (1971 edition), not included within the definition of public waters, which are 10 or more acres in size in unincorporated areas or 2.5 or more acres in incorporated areas."

The United States Fish and Wildlife Service (USFWS) has also compiled wetland maps through the National Wetland Inventory (NWI). The NWI maps identify wetland types 1-8, regardless of size, and therefore provide a more complete accounting of wetland areas. Detailed USFWS NWI maps can be found on the USFWS interactive Geospatial Wetlands Information website at http://www.fws.gov/wetlands/Data/Mapper.html. The District has chosen to use this interactive mapping tool, as opposed to a hard copy map, as it is the most up to date and allows flexibility in selecting data sets.

In 1994, Scott Soil and Water Conservation District (SWCD) conducted a detailed wetland inventory for the District. Under this effort, the SWCD reviewed maps from the DNR, the Metropolitan Mosquito Control District, the United States Department of Agriculture, the United States Fish and Wildlife Service, and the United States Geological Service to identify existing wetlands, drainage areas for these wetlands, and drainage channels. Tile records were reviewed to obtain information on drained wetlands. Historical aerial photographs dating back to 1937 were also reviewed to identify original wetland areas. Field reconnaissance was used to complete the inventory by providing a field verification of the mapping results. The inventory records and maps can be viewed at the PLSLWD office, and were used as the base layer for the PLSLWD's 2010 Wetland Inventory and MnRAM Assessment.

7.1.1. Wetland Inventory Methodology

EOR coordinated field data collection efforts with staff from PLSLWD and Scott County SWCD. TEP members were involved with calibrating data collection methods so that all field teams would collect MnRAM data using the same protocols. Numerous in office and field days were dedicated to teaching MnRAM methodology to all field teams, during which multiple wetland examples were used to calibrate individual teams' data collection methods to be identical. An integrated QA/QC process accompanied the field data collection process, involving EOR staff, BWSR/TEP staff, and PLSLWD staff for double checking MnRAM data collected in the field.

The 2010 inventory is a map verification of the datasets described in Section 7.1 plus a functional assessment (described is Section 7.2 of this Plan). The inventory was restricted to areas not being evaluated by other WCA LGUs in the District. This includes the City of Savage.

7.1.1.1. Contributing Partners

Field data collection was performed by staff from PLSLWD and Scott SWCD, with training provided by EOR staff. Following is a list of individuals participating in the inventory:

PLSLWD Staff	Joshua Mankowski, Stacy Sass
Scott SWCD Staff	Ryan Holzer, Willie Peters, Dave Rickert, Jaime Rockney, Scott Schneider, Doug Schoenecker
EOR Staff	Melissa Arikian, Annie Felix, Mike Majeski

7.1.1.2. TEP Input

TEP meeting #1 and #2 (see Section 8.1 of this Plan) were used to develop the methodology for the inventory and functional assessment.

7.1.1.3. Reference Wetlands

Reference wetlands were not established for this plan. The City of Savage CWPMP identified reference wetlands, categorized as Preservation, located on public park land, and could be called upon for use in this plan.

7.1.2. Wetland Inventory Results

A series of graphs were produced to summarize the number of high, medium, and low scoring wetlands for each function assessed, found in Appendix A.

7.2. Wetland Functional Assessment (MnRAM)

The methodology used the Minnesota Routine Assessment Method (MnRAM) Version 3.2. This version has been supplanted by MnRAM 3.4 (BETA) Sept 15, 2010. The differences between versions include these two additional features available in MnRAM version 3.4 (published after the assessment) including:

- Sensitivity to Stormwater & Urban Development;
- Additional Stormwater Treatment Needs.

The differences between versions 3.2 and 3.4 do not change the recommended management and activities of the Wetland Plan.

7.2.1. Calculation Methodology

Data were collected for each evaluated wetland either through GIS sources or field inspection. Field assessment was performed by two-person professional crews with training[4] at the outset to ensure consistent use of the evaluation methodology. In particular, training emphasized familiarity with dominant versus subdominant definitions, and the 10% rule as it pertains to plant community mapping per MnRAM. Wetlands encountered in the field but not mapped or inventoried, were noted and field evaluation was performed. Field data were recorded onto paper data sheets and entered into the MnRAM database in the office[5]. Map locations and GIS wetland evaluation data were previously entered onto the data sheets. Wetlands were initially sorted and grouped as 'W' or 'D' group wetlands, representing extant wetland for 'W' and drained wetland for 'D' based on the original Scott SWCD Wetland Inventory. 'D' wetlands were field evaluated for restoration potential only unless verified in the field to be functioning wetlands.

[4] August 19, 2010, field training session conducted utilizing guidance provided by BWSR (available at the BWSR website).

[5] Per TEP recommendation and approval, field evaluation conducted using MnRAM standard evaluation sheet utilized, but modified to 'strip' out GIS-evaluated questions.

Methodology was presented in modified form and approved by the TEP[6]: Listed below are all of the functions and uses that can be evaluated using the MnRAM, those not evaluated for this plan are crossed out.

Vegetative Diversity/Integrity
Maintenance of Characteristic Hydrologic Regime
Flood/Stormwater/Attenuation
Downstream Water Quality
Maintenance of Wetland Water Quality
~~Shoreline Protection~~
Maintenance of Characteristic Wildlife Habitat
~~Maintenance of Characteristic Fish Habitat~~
~~Maintenance of Characteristic Amphibian Habitat~~
Aesthetics/Recreation/Education/Cultural
~~Commercial Uses~~
Groundwater Interaction
Restoration Potential

The MnRAM evaluation for this plan does not include questions #29 through 34 (related to Shoreline Protection), and questions #42 – 57 (related to Amphibian Habitat, Fish Habitat, and Commercial Uses).

For "Groundwater Interaction" the focus was on the one field-evaluated question of #62 – Inlet/Outlet configuration. In addition, if a wetland (mostly all recharge wetlands for this District) displayed obvious signs of high or low infiltration capacity, such was noted in the field.

For "Restoration Potential" wetlands were identified first by examining for drained wetlands. Additional potential areas for wetland restoration were recorded in the field, marking them on field maps and transferring those potential basin locations to the GIS database. Determination of these potential areas was based upon the "D" or "drained" basins from Scott County SWCD's original wetland inventory, and was further refined during the field collection phase of this project.

For "Restoration Potential", question #65 regarding number of landowners is bias towards higher restoration potential when fewer landowners involved. This question was not answered for this plan. The number of landowners can be an important factor, but otherwise good candidate restoration sites may involve a higher number of landowners. As such, during plan implementation, this information can be made available to the TEP and decision-makers on a case by case basis for targeting sites already prioritized for restoration (according to Section 4.2).

7.2.2. Results

A series of graphs were produced to summarize the number of high, medium, and low scoring wetlands for each function assessed, found in Appendix A.

7.3. Public Values Survey

In accordance with WCA Rule 8420.0830, Subp. 6, C, local citizen involvement was sought for the determination of local value. The survey was posted online and the request to respond to the survey was included in a newspaper article, posted on PLSLWD's website and verbally communicated at a public meeting.. The survey requested that residents rank wetland services from most to least important. They could either return the paper survey or visit a website to

[6] Reference: Arikian, Melissa, August 16, 2010, to the TEP by email correspondence, presenting the proposed methodology and associated modifications. Review and revisions comments received via email reply.

complete the survey. In addition, the survey provided a place for residents to submit written comment about the survey or other wetland issues. The survey protocol and complete results are presented in this section of the Plan. The summary tabulation and analysis are presented in Section 3.0 of this Plan.

7.3.1. Survey Protocol

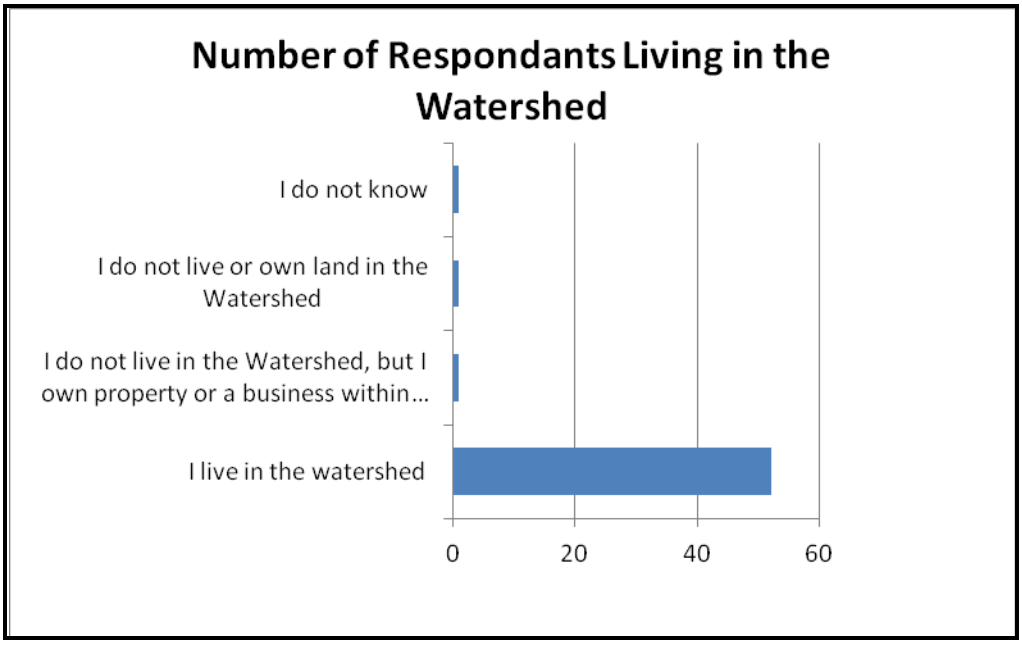
The survey protocol was developed out of recommendations from TEP meeting #2:

- ✓ An open house meeting should be held to help involve citizens. Target the local lake associations and sportsman groups. A survey should be sent to landowners as part of citizen involvement.
- ✓ It is important to involve the individual property owners near wetland areas. Property owners may view the wetland differently than those who use the wetland lands for recreational purposes.
- ✓ It is very important to try and obtain a good cross-section of property owners.
- ✓ The surveys should be used to inform citizens as well as ascertain their views for ranking the values of the wetlands. Wetlands may serve functions that the property owners are unaware of, but view as important.
- ✓ The type of property owner (farmer vs. urban resident) can heavily influence the responses received in a survey. A balance between the different groups must be acquired.
- ✓ Some property owners' views towards wetlands may be changing. At one time the wetland may have been viewed as unusable land; it is now viewed as a potential resource (a way to attract development).
- ✓ The information obtained from the resident surveys can be utilized in other projects being conducted by the District (TMDL Implementation Plan, rules revision).

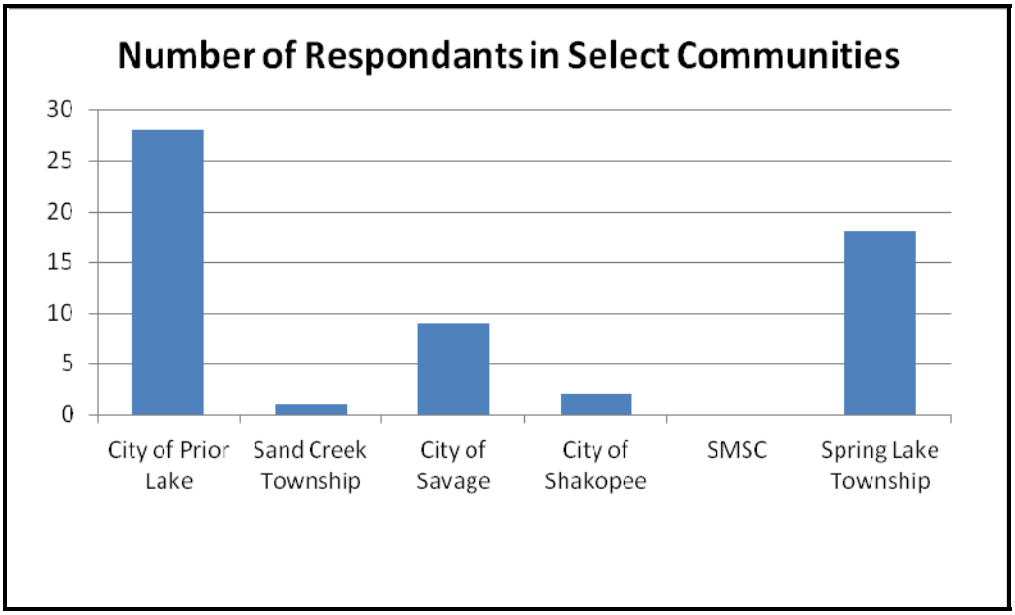
7.3.2. Results

The online survey resulted in a total of 55 responses between February 15 and March 24, 2011.

1. Do you live or own property within the geographic boundary of the Prior Lake – Spring Lake Watershed District?

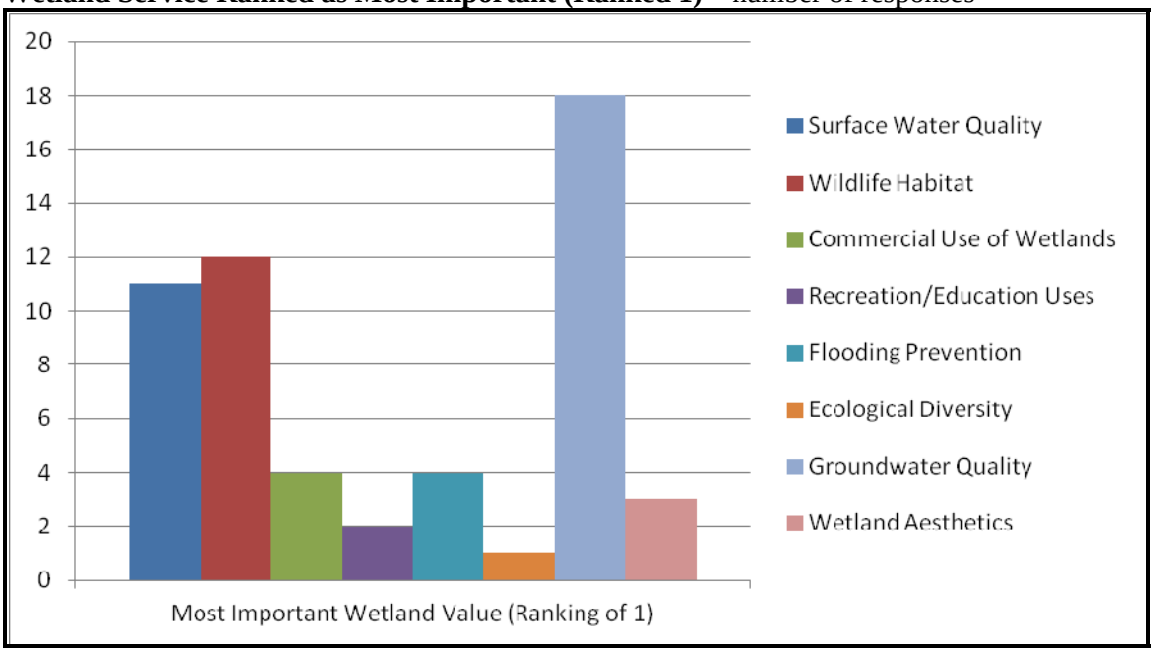


2. In which community do you live?

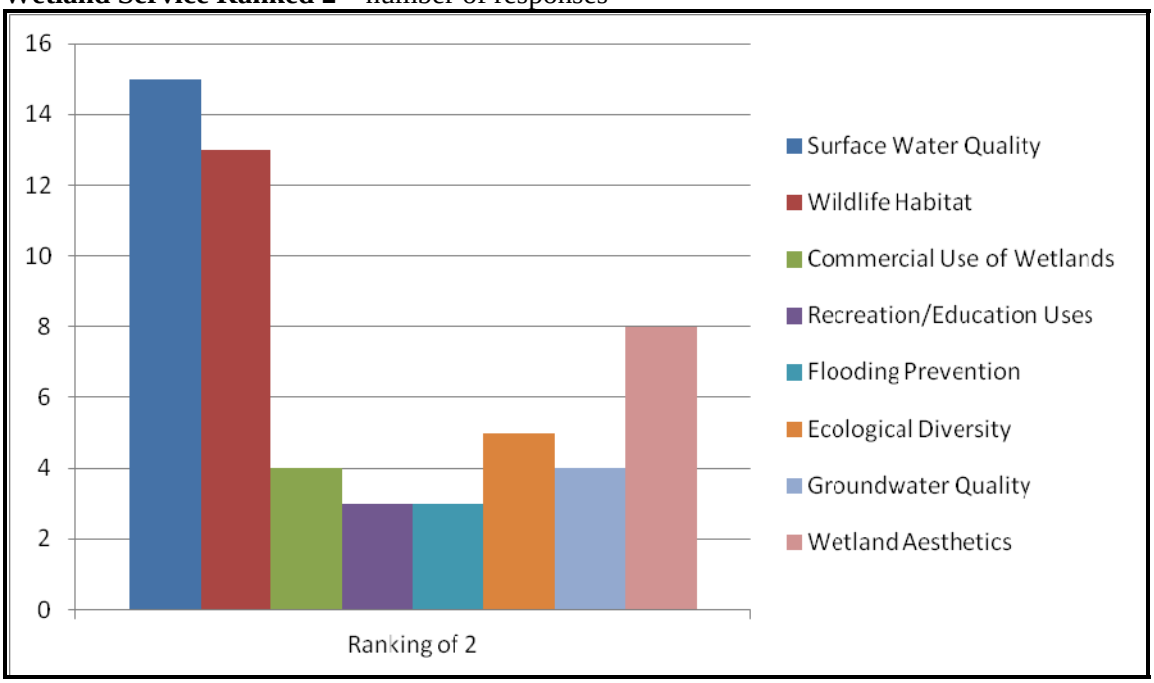


3. Rank the following wetland services of importance to you from 1 (the most important to you) to 8 (the least important wetland service to you).

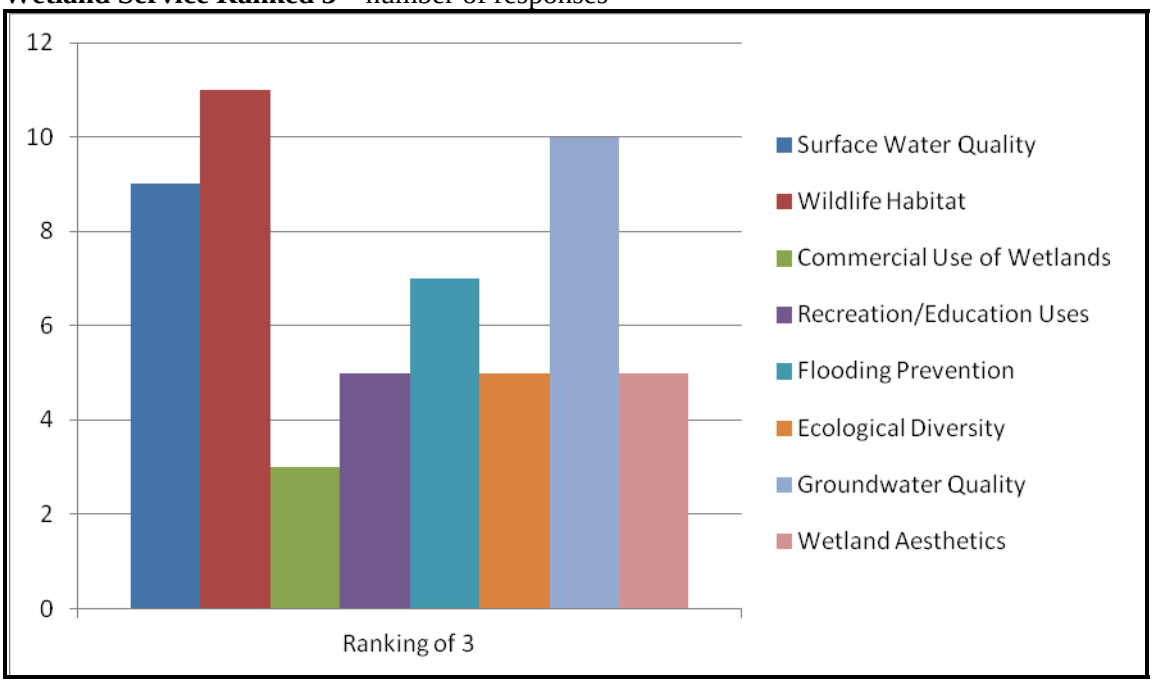
Wetland Service Ranked as Most Important (Ranked 1) – number of responses



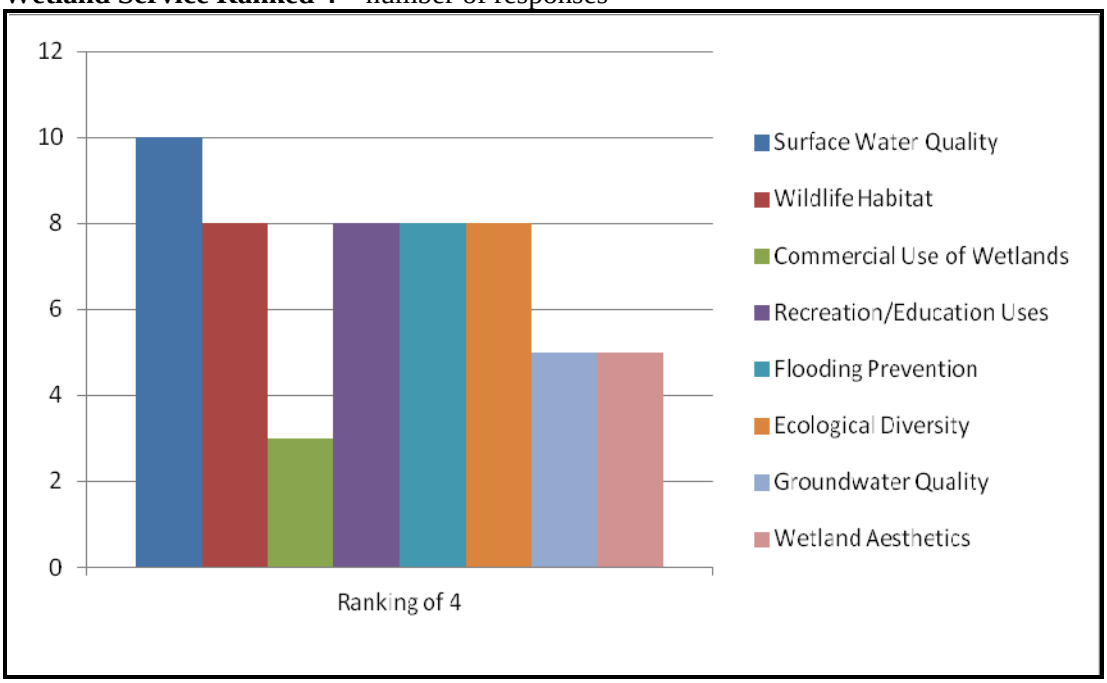
Wetland Service Ranked 2 – number of responses



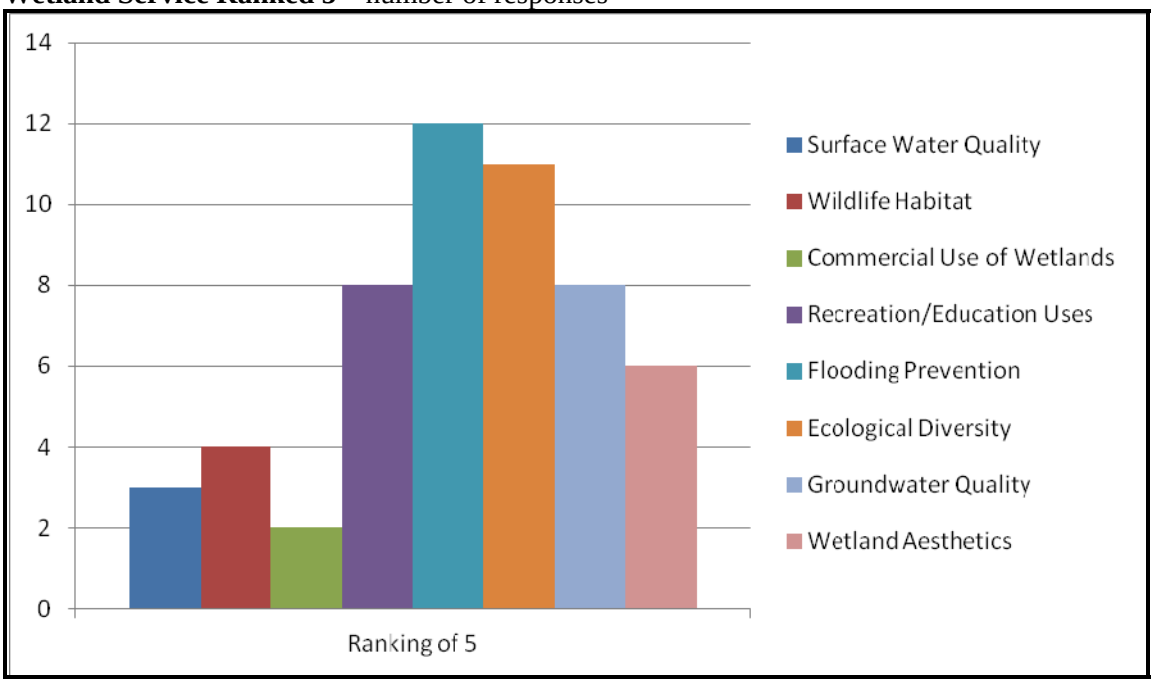
Wetland Service Ranked 3 – number of responses



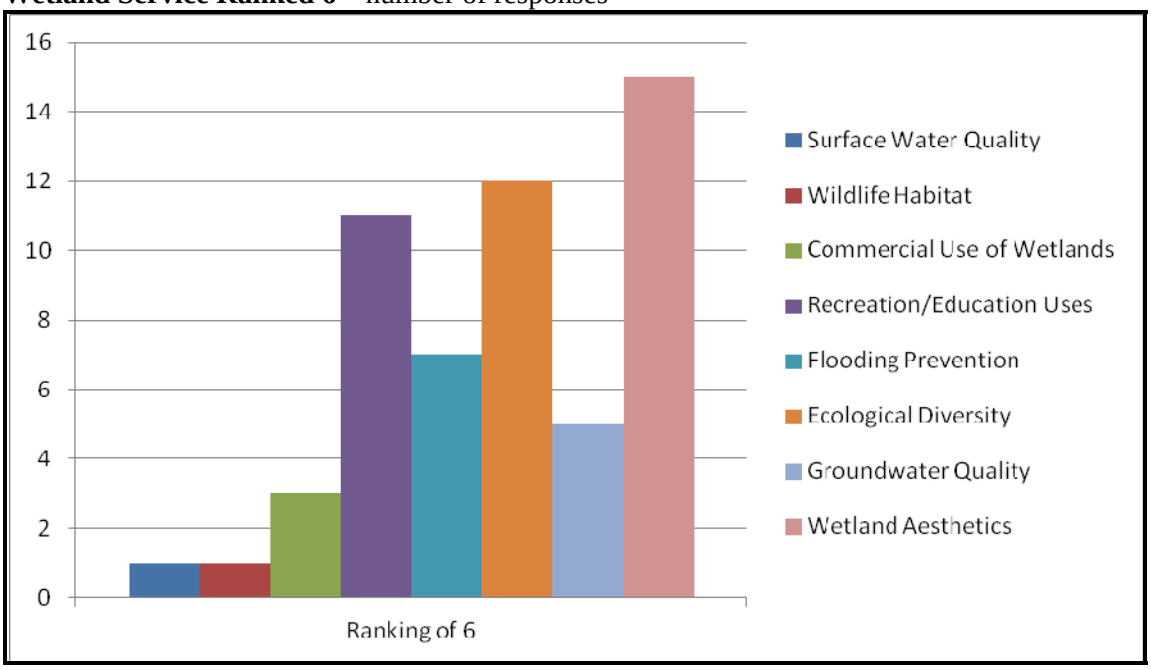
Wetland Service Ranked 4 – number of responses



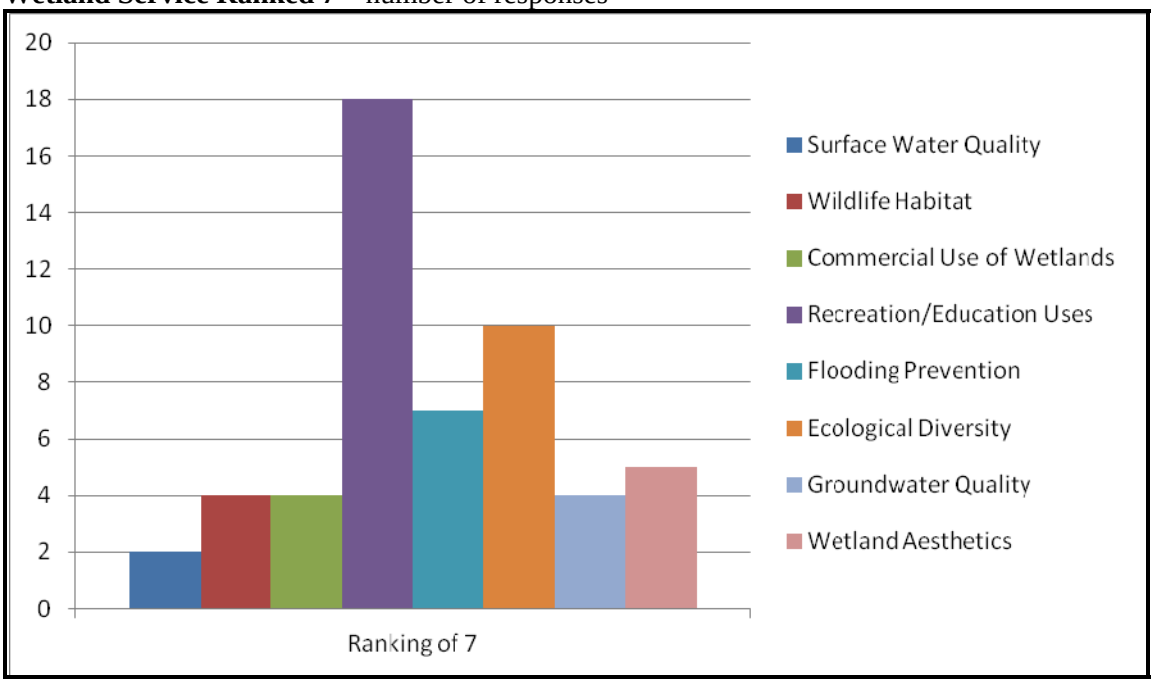
Wetland Service Ranked 5 – number of responses



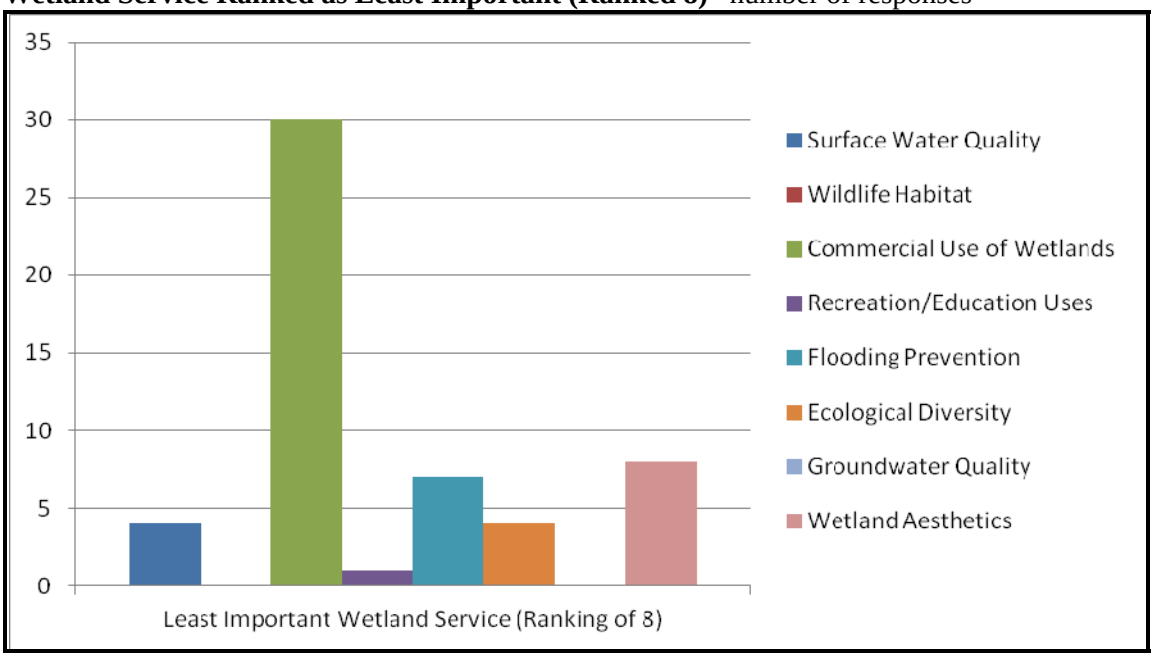
Wetland Service Ranked 6 – number of responses



Wetland Service Ranked 7 – number of responses

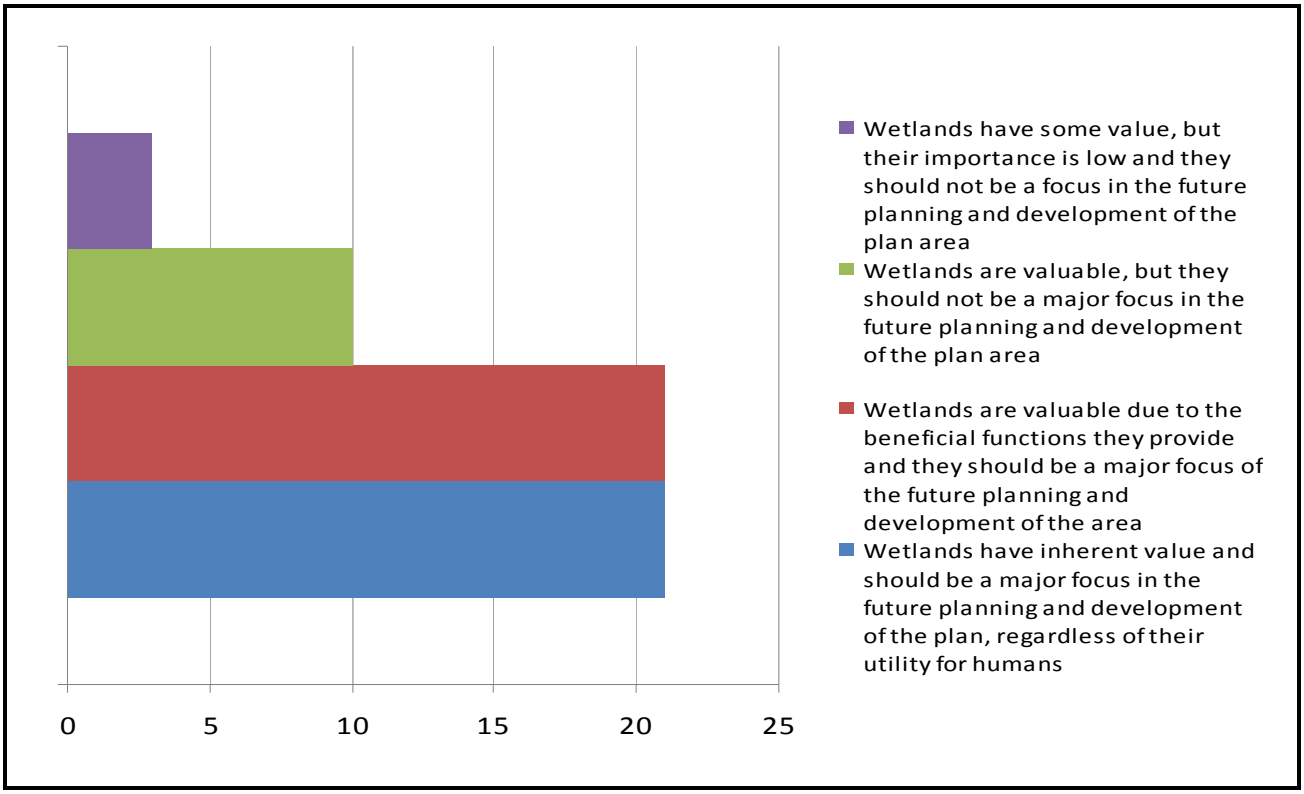


Wetland Service Ranked as Least Important (Ranked 8)– number of responses

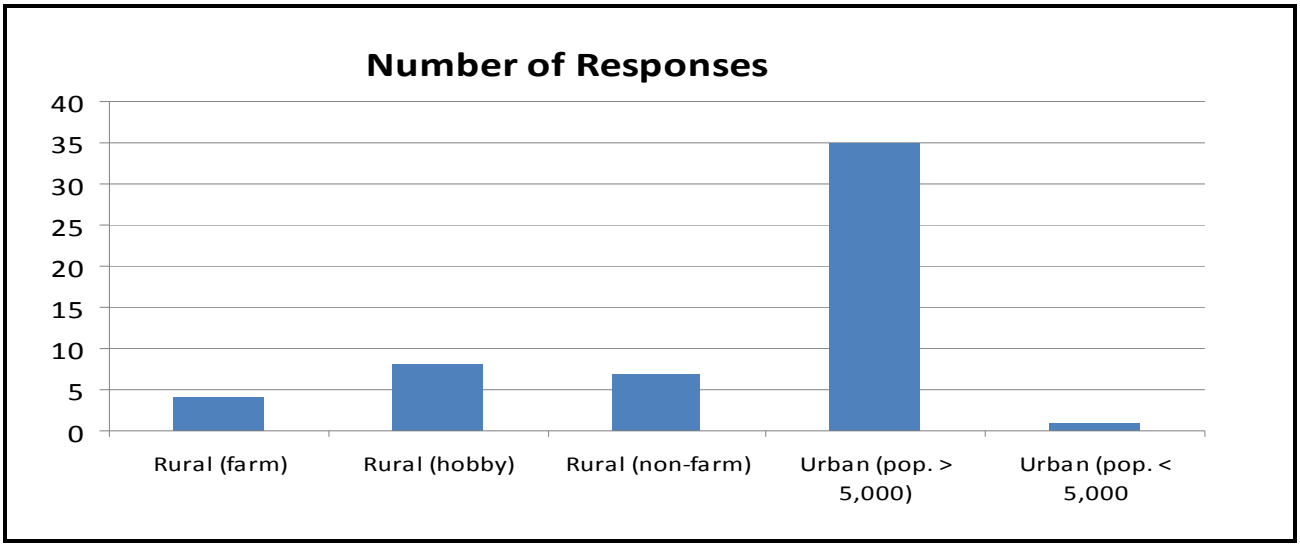


4. Which of the following statements best describes your general opinion about wetlands and their role in community planning?

Number of Responses



5. Your home is:



Additional Responses from 23 of 49 online entries [sic- for all entries below]

- Somewhat biased survey for myself because I do research on Spring Lake regarding excess nutrients which lead to eutrophication.

- We Live on Cates Lake, near Prior Lake. Our lake is overcome with weeds every summer and this has killed off the fish. Why can we not use chemicals or any other methods to control the excess weeds? The weeds destroy the quality of the water and destroy fish life. It appears that if this continues the lake will continue to build sediment until it eventually dries up.

- Got your invite to the 2/15/2011 meeting today, on 2/15/2011. Would like the information, but am involved with church tonight.

- I don't have an answer for this problem, but I wish we could do more to improve the water quality in the area lakes!! Fish and Spring are slime green from June- Aug. The whole summer!!! I know you can't control run off. But it's sad for someone like me who grew up on these lakes to see what has happened over the past 30 years Thanks for listening

- A little more advance notice for the citizen meetings i.e., 'Clean Water Event'. Your letter dated 2/8/11 arrived this afternoon 2/15/11. Citizens may not have time to rearrange schedules to attend. Sending things bulk mail always takes longer.

- Wetlands are a priority habitat. If you have abundant healthy and functional wetlands, and they are protected, water quality, flood protection etc. should be obtainable due to the protection of this important resource

- I have heard that the Prior Lake High School may be considering the development of some of their property that may be part or abuts the wetlands. We have enough residential developments that aren't being completed to be adding another

- The wetlands are a key attraction to the area and we value them and what they bring to the people of spring lake

- I have a one-acre pond in my backyard which is green 5 months out of the year. This drains directly into Prior Lake. Can anything be done? I left a message by phone when I received the first invitation to call Mike, no one ever called me back. Thank you

- There must be coordination with developers in order to preserve our wetlands in its natural state.

- Restrictions on use should be reasonable and purposeful. Care should be taken not to unnecessarily limit development to save a few swamps.

- I wanted to give an 8 on nearly the entire survey, but I guess this is the best way to tell the number 1 priority

- Allot of the wetlands around Prior Lake contain evasive species of plants that need to be cleared/cleaned up to allow more native plants to flourish. Our wetland is chocked with evasive plants and does not promote any wildlife (geese, mallards, wood ducks and other migratory birds) from using it

- Downscale Ryan Park and give us back serenity and our wetlands.

- I live in an area with poor quality wetlands, i.e. reed grasses, rag weeds, etc. In my opinion, a controlled burn should take place to replant with prairie grasses and wild flowers.

- Work done last year on the wetland adjacent to my property did nothing to improve aesthetics or reduce the flooding that occurs into my yard. Closer supervision of the contractors work is necessary in future projects. What I was told of the final design did not occur in the end.

- During your compilation of the Protection and Management Plan, remember the vast majority of the wetlands in question are privately owned and managed. We do not need additional regulation on landowners than the current wetland preservation and clean water acts.

- Very few of our neighbors respect the wetland/conservation easements. They mow right down to the water. They cut down the wild grasses that were planted - install retaining walls. It is very frustrating that we are one of few who follow the rules.

- I own property that has a wetland on it. I feel that if I am paying the tax on the wetland, and am a good steward of the land, I fear further regulation will make it less appealing to live in this watershed

- Presently the mining operations of PL Aggregates are negatively impacting the PL/Savage Watershed District. Habitat (trees, environment and wetlands) is being destroyed with serious consequences for the future. The illegal draining of Cates Lake through the 4-inch pvc pipe into

the 5-acre pond behind our house should cease. The forest and ecological environment is being depleted with run off and negatively shifts the animals and wildlife into urban areas - coons, foxes, muskrats, coyotes, turkeys, deer - and has over-burdened our property with squirrels. We attended the Scott County Watershed meeting 4-5 years ago which said that PL Aggregates should cease and desist their digging operations so as not to negatively impact the Jordan Aquafer of which they said they were only 16 feet above the Aquifer and should cease mining operations of the gravel washing. Furthermore Scott County watershed supervisor said that the old PL dump to the west of then present operation should be avoided because of all of the mercury, pcb and hazardous waste that was on that site. Savage somehow procured the old PL dumpsite on some type of exchange some years ago. PL Aggregates has continued to mine, cut trees and operate in this area. We believe that this should be looked into as part of the Watershed District future plan

- I would like legal access to rest of my property, to make a walking path, to make land provide a profit by growing something for myself and wildlife.

- If wetlands continue to be treated on the same par as endangered species of animals, then people who 'own' wetlands are deserving of a tax break for owning land they can do nothing with, or better yet, add the amount of wetland acreage to their tillable land in order to qualify for agricultural credit in county property tax determination.

- We live in an area with several wetland areas. We value and prize these beautiful spaces for ourselves, the public who also enjoy them (aka trails) and future generations. It is also essential to provide necessary shelter and food for our wildlife.

8. TEP AND STAKEHOLDER INPUT PROCESS

Plan development, review, and approval occurred in three sequential phases outlined below. Section 5.2 and 5.3 of this plan list TEP representatives and stakeholders, respectively, invited to meetings and to provide plan review.

Phase 1 (Data Collection and Evaluation) - 2010

- Compile existing wetland data records
- Build GIS database from available records
- Hold TEP/Stakeholder meeting #1, kick-off meeting. Invite resource agency staff and public to actively participate in the development of the plan
- Notify landowners know about the process and obtain their input on what they most value in their wetlands
- Attain access permission from landowners for field inventory
- Collect the wetland inventory data and assess it using the MnRAM methodology
- Develop MnRAM database and maps

Phase 2 (Plan Development) – 2011-2012

- Hold TEP/Stakeholder meeting #2
- Conduct values survey and public event February 15
- Complete resource prioritization
- Write preliminary draft plan
- Discuss preliminary draft plan at PLSLWD Citizens Advisory Committee (CAC) meeting #1
- Hold TEP/Stakeholder meeting #3

Phase 3 (Plan Approval) - 2012

- Discuss Draft Plan at PLSLWD Citizens Advisory Committee (CAC) meeting #2
- Submittal of Draft Plan (February 2012) to Stakeholders and Board for comment
- Summary of comments received reviewed by PLSLWD Staff and Board
- Draft Plan Editing
- PLSLWD Board review and approval of final plan (April 2012)

8.1. Input Meetings

Phase 1

The purpose of TEP/Stakeholder meeting #1, August 10, 2010, was to inform the included cities and townships of the plan goals, seek input on potential overlap of this plan with existing WCA LGU jurisdiction, and seek input on how this plan can address local resource issues, present the plan development process, and identify likely priority issues and the approach to public involvement.

Chart 8.1-1. TEP/stakeholder meeting #1 invitees and attendees (*).

Entity	Representative
Board of Water and Soil Resources	Brad Wozney* Ken Powell*
City of Prior Lake	Ross Bintner*
City of Savage	Jon Allen
City of Shakopee	Joel Rutherford
Emmons & Olivier Resources, Inc. for PLSLWD	Melissa Arikian* Jason Naber*

MnDNR	Melissa Doperalski &/or Janell Miersch &/or Craig Wills
Prior Lake-Spring Lake Watershed District (PLSLWD)	Joshua Mankowski* Stacy Sass* Liz Spande*
Scott County Soil and Water Conservation District	Ryan Holzer* Troy Kuphal*
Spring Lake Township	Ben Meyer*
USACE	Michael Setering

Phase 2

The purpose of TEP/stakeholder meeting #2, January 27, 2011, was to present the findings of the public values survey and seek input on the process for restoration sites prioritization.

Chart 8.1-2. TEP meeting #2 invitees and attendees (*).

Entity	Representative
Board of Water and Soil Resources	Brad Wozney Ken Powell*
City of Prior Lake	Ross Bintner*
City of Savage	Jon Allen*
City of Shakopee	Joel Rutherford
Emmons & Olivier Resources, Inc. for PLSLWD	Melissa Arikian* Jason Naber*
MnDNR	Melissa Doperalski &/or Janell Miersch &/or Craig Wills*
Prior Lake-Spring Lake Watershed District (PLSLWD)	Michael Kinney* Joshua Mankowski*
Scott County Soil and Water Conservation District	Ryan Holzer Troy Kuphal* Dan Miller*
Spring Lake Township	Ben Meyer* Kathy Nielson*
USACE	Michael Setering

8.2. Plan Review

Phase 3

The purpose of TEP/stakeholder meeting #3 (January 12, 2012) was to discuss Proposed Wetland Management Classes and Proposed Management Standards. TEP review comments were also incorporated into the preliminary Draft Wetland Plan. The process for plan approval was also discussed.

Chart 8.1-3. TEP meeting #3 invitees and attendees (*).

Entity	Representative
Board of Water and Soil Resources	Brad Wozney Ken Powell*
City of Prior Lake	Ross Bintner*
City of Savage	Jon Allen Sam Lucido
City of Shakopee	Joel Rutherford Joe Swentek
Shakopee Mdewakanton Sioux Community	Stan Ellison
Emmons & Olivier Resources, Inc. for PLSLWD	Melissa Arikian* Jason Naber*
MnDNR	Melissa Doperalski &/or Jeff Berg &/or Craig Wills
Prior Lake-Spring Lake Watershed District (PLSLWD)	Michael Kinney* Stacy Sass* Nat Kale*
Scott County Soil and Water Conservation District	Ryan Holzer Troy Kuphal Dan Miller
Spring Lake Township	Ben Meyer* Kathy Nielson*
USACE	Michael Setering

Following submittal of the Draft Plan (February 2012) the District received comments from the following entities.

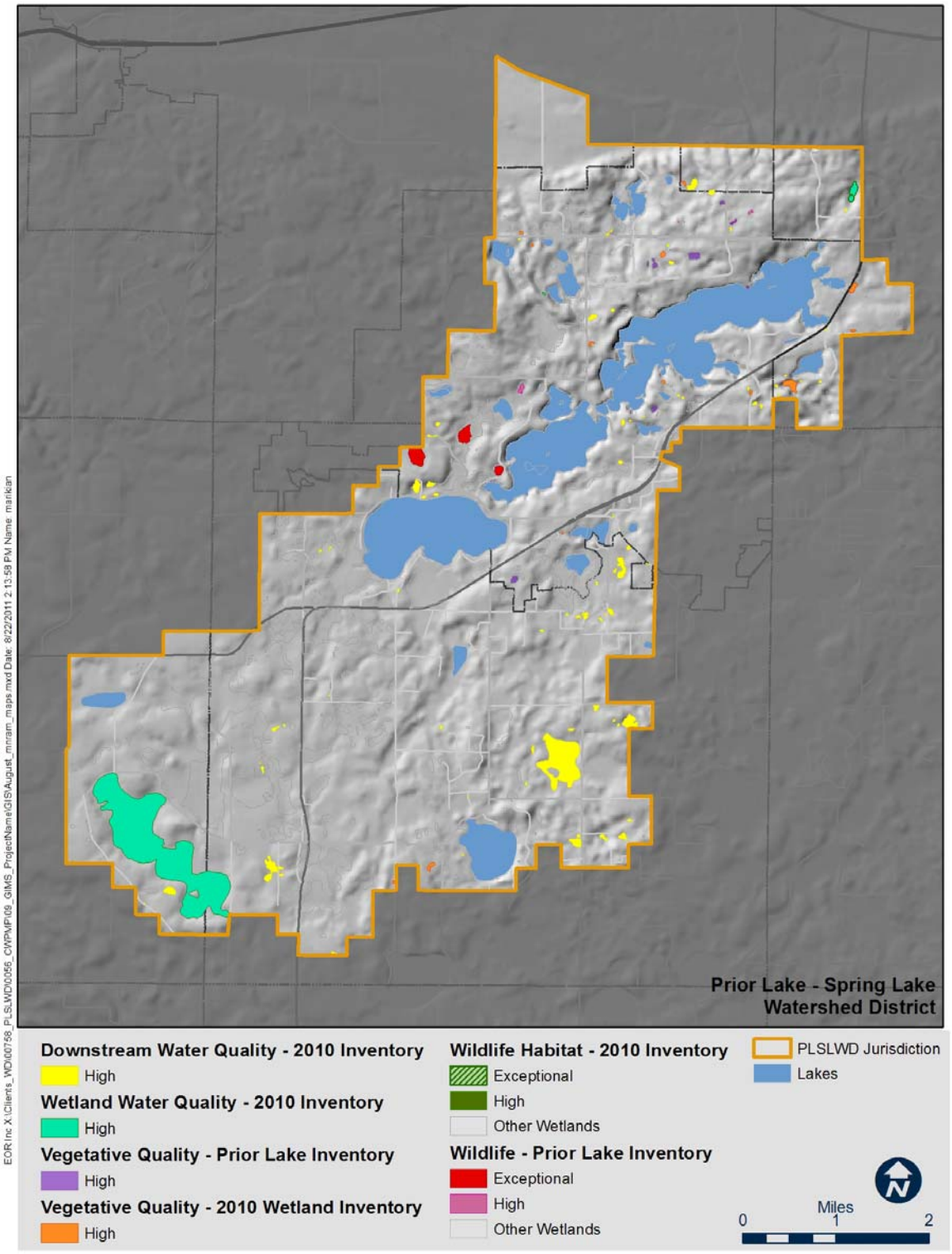
- MN Board of Water and Soil Resources (BWSR), Ken Powell, 2-17-12
- City of Prior Lake, Ross Bintner, 2-7-12
- Army Corps of Engineers, Michael Setering, 3-7-12
- Scott County on behalf of Sand Creek Township, Paul Nelson 3-7-12
- Scott County, Jason Swenson 3-5-12

A summary memo of those comments was prepared and submitted to the PLSLWD Board. The comments were carefully reviewed and considered in development of the Final CWP dated April 10, 2012.

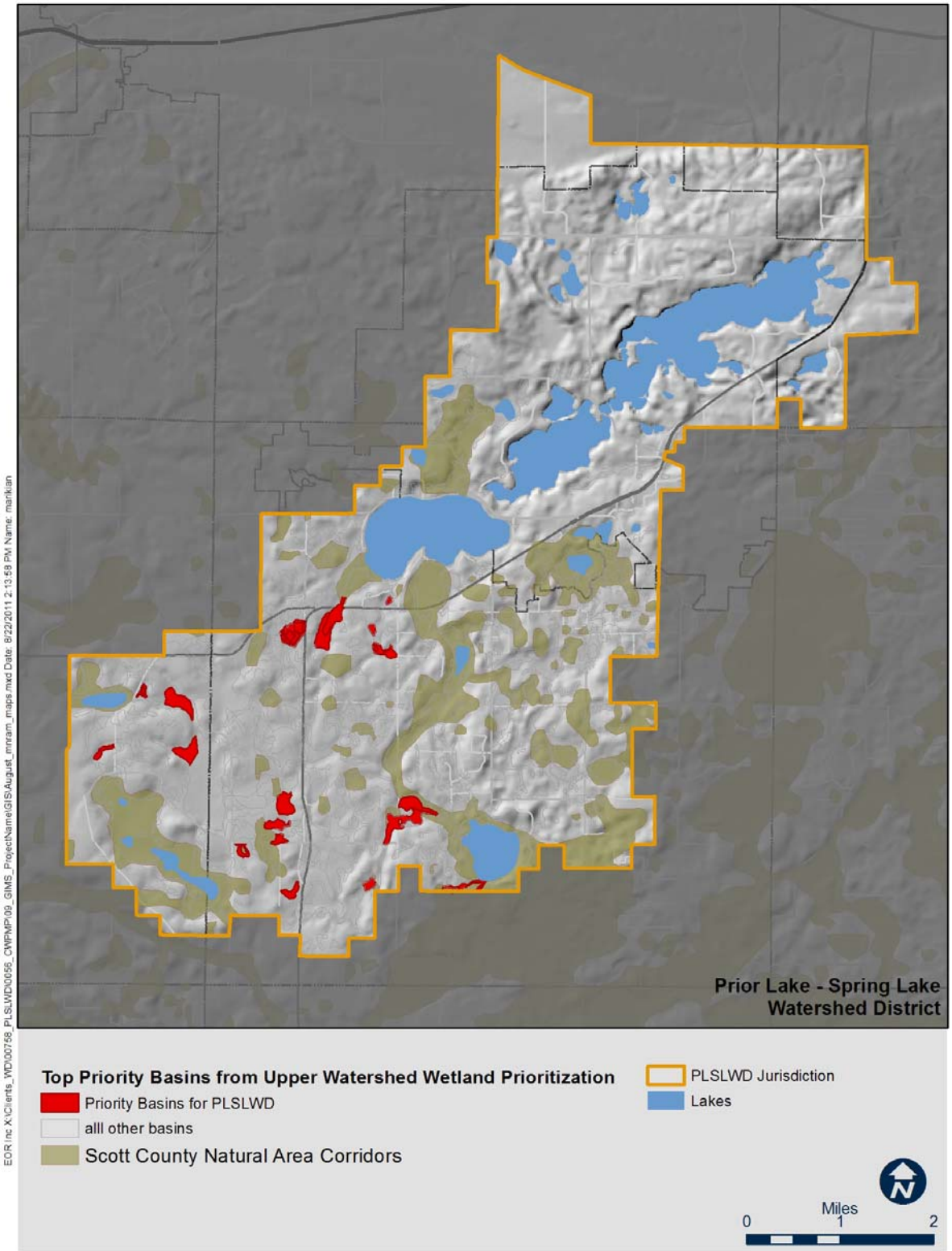
8.3. Plan Approval

At its regularly scheduled board meeting on April 10, 2012, the PLSLWD Board of Managers reviewed and signed resolution 12-246 that adopts the CWP as a resource management plan of the PLSLWD. They directed their Administrator to utilize the CWP in identifying, setting priorities for and implementing programs and capital projects, and make the CWP available to governmental partners and other interested parties for better coordination of resource management programs. The PLSLWD may further formalize the findings of the CWP at a later time, which may include incorporating CWP management standards into PLSLWD rules thru rulemaking and completing procedures for adoption of the CWP as a comprehensive wetland protection and management plan.

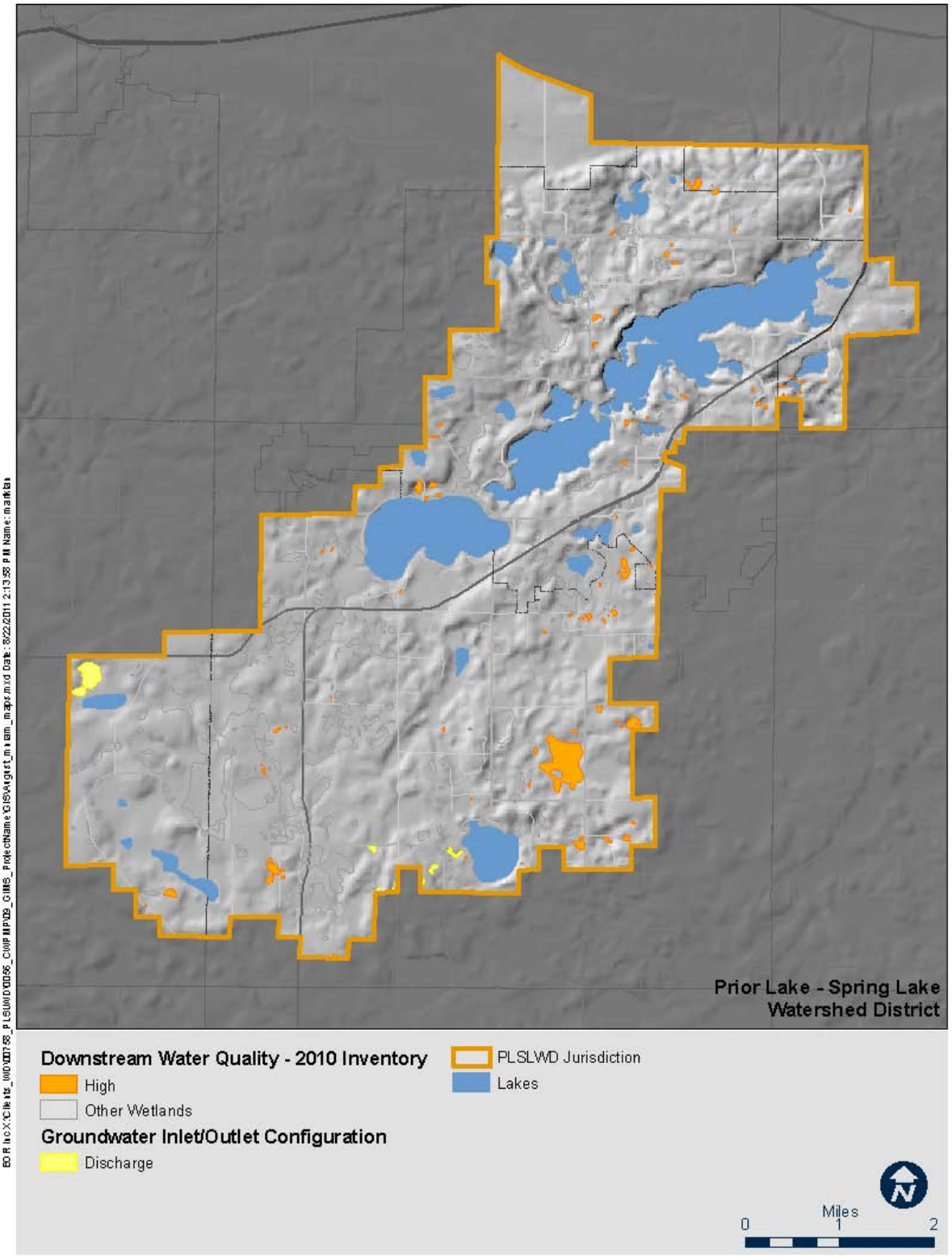
Map 4.1-1. High Priority Preservation Wetlands.



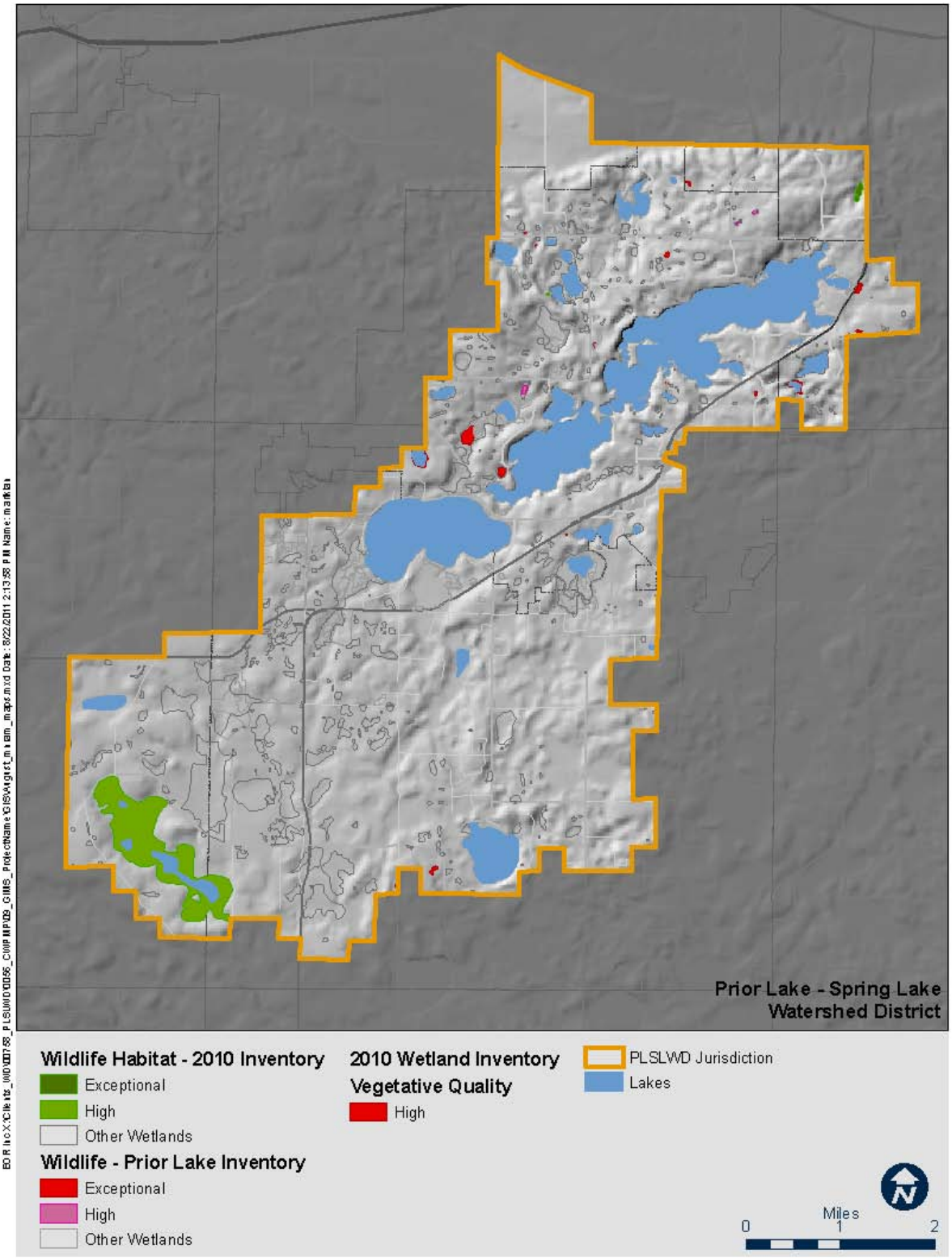
Map 4.2-1. Top Restoration Priority Wetlands with Scott County Natural Areas Corridors.



Map 4.5-1. Wetlands with Hydrology Management Class.



Map 4.5-2. Wetlands with Natural Areas Management Class.



Map 4.5-3. Basins with Restoration/Enhancement Management Class.

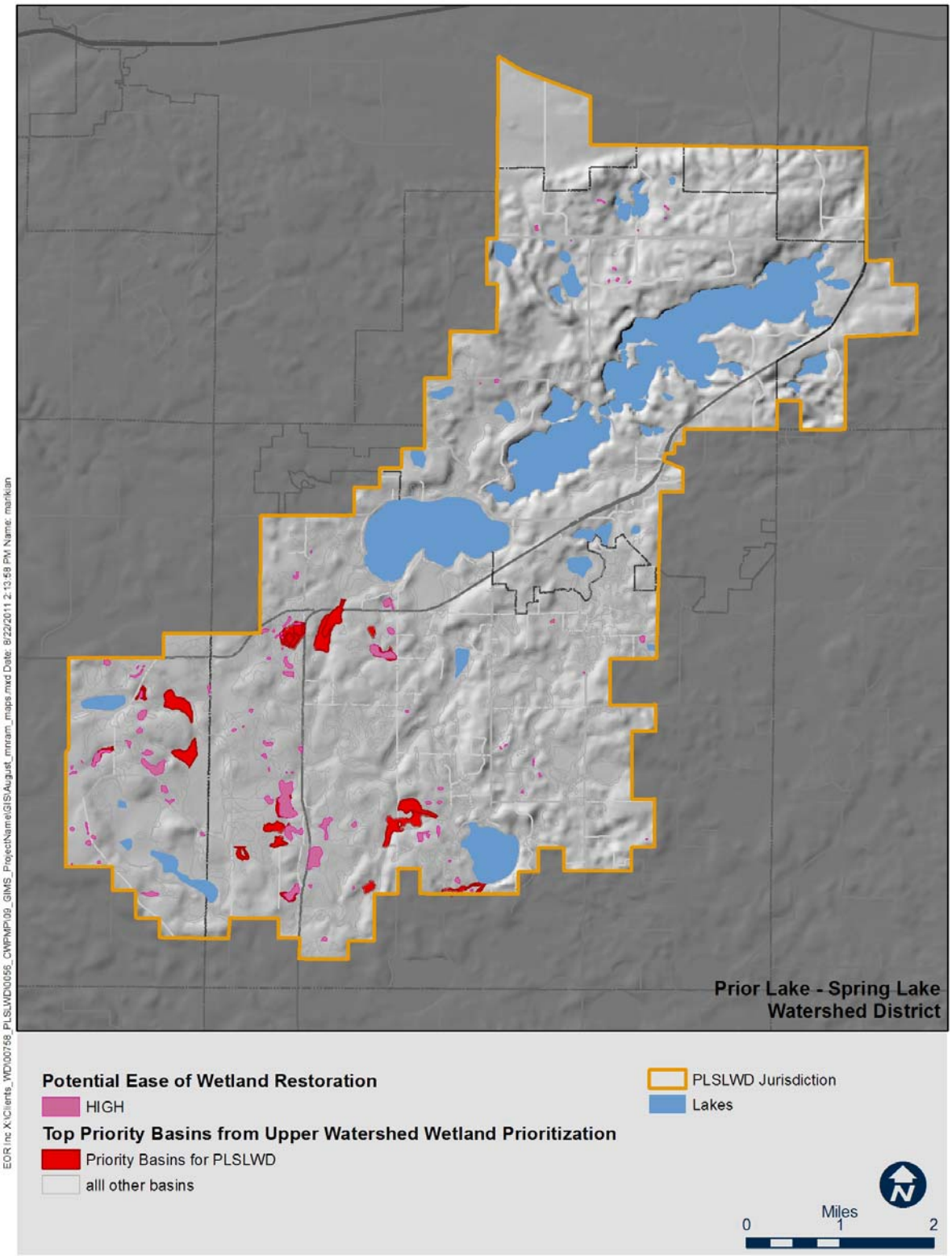


Figure 7.2-1. Cumulative Function of all 2010 Inventoried Wetlands for Vegetative Diversity/Integrity

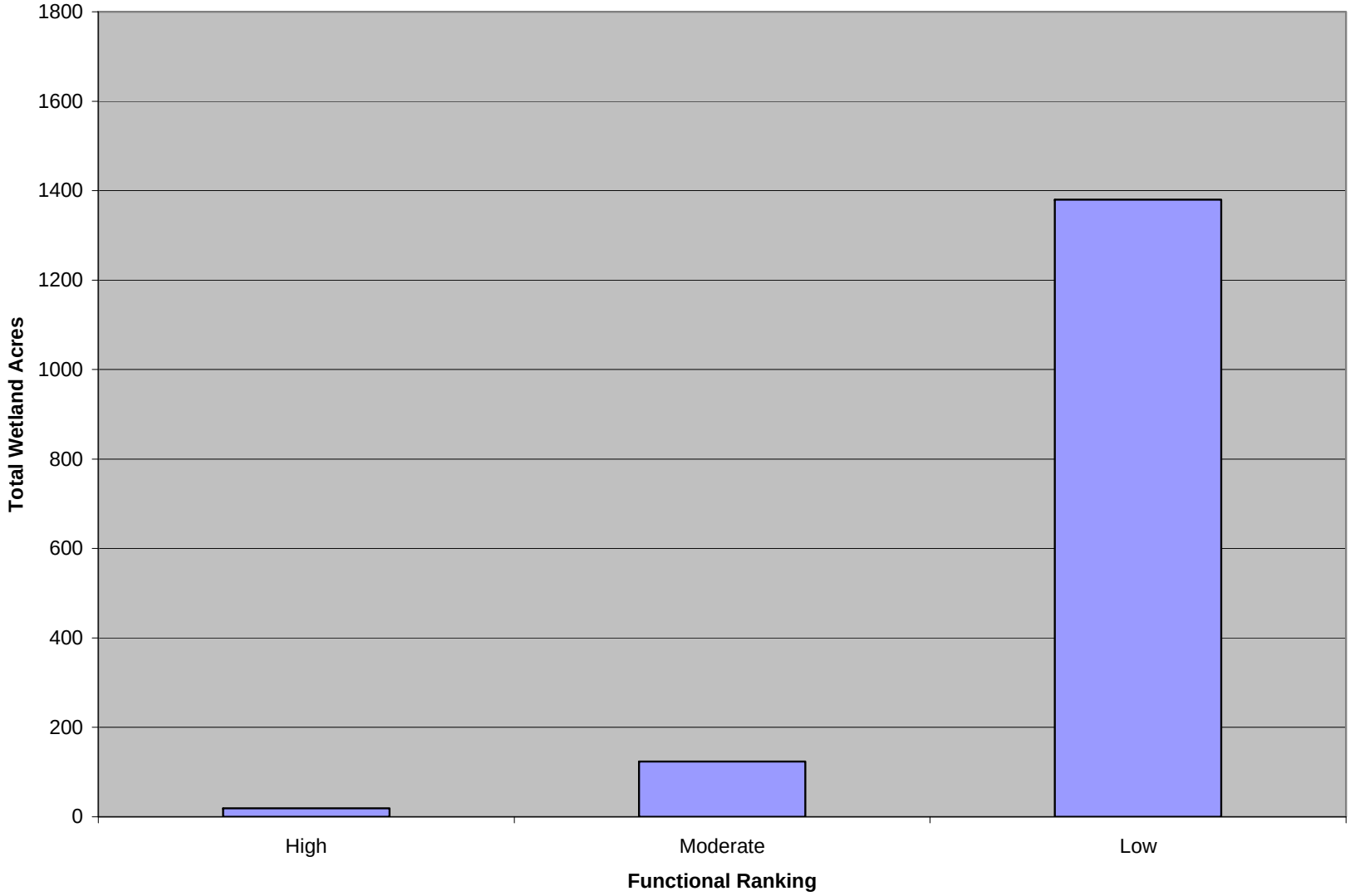


Figure 7.2-2. Cumulative Function of all 2010 Inventoried Wetlands for Maintenance of Characteristic Hydrologic Regime

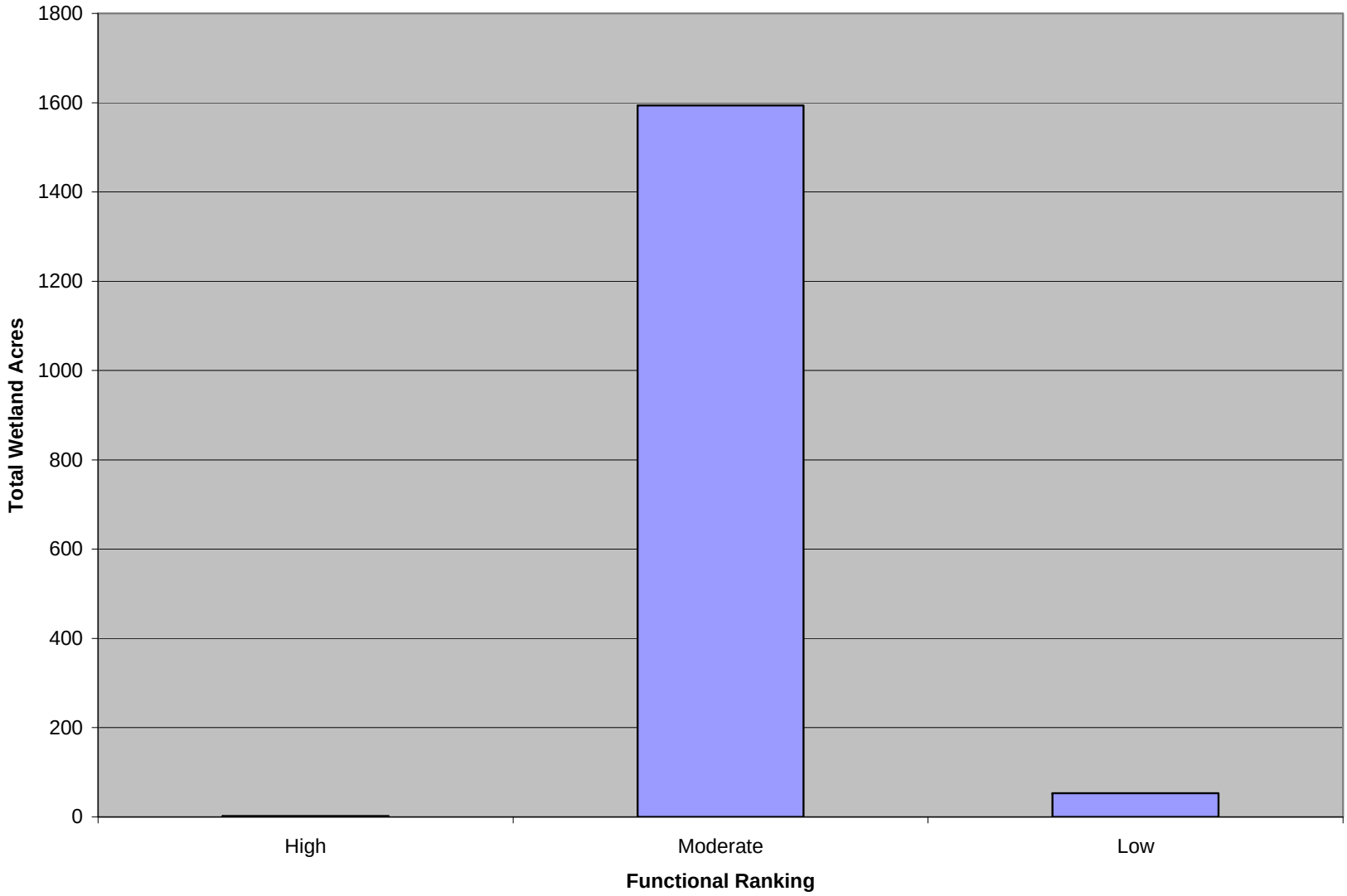


Figure 7.2-3. Cumulative Function of all 2010 Inventoried Wetlands for Flood/ Stormwater/ Attenuation

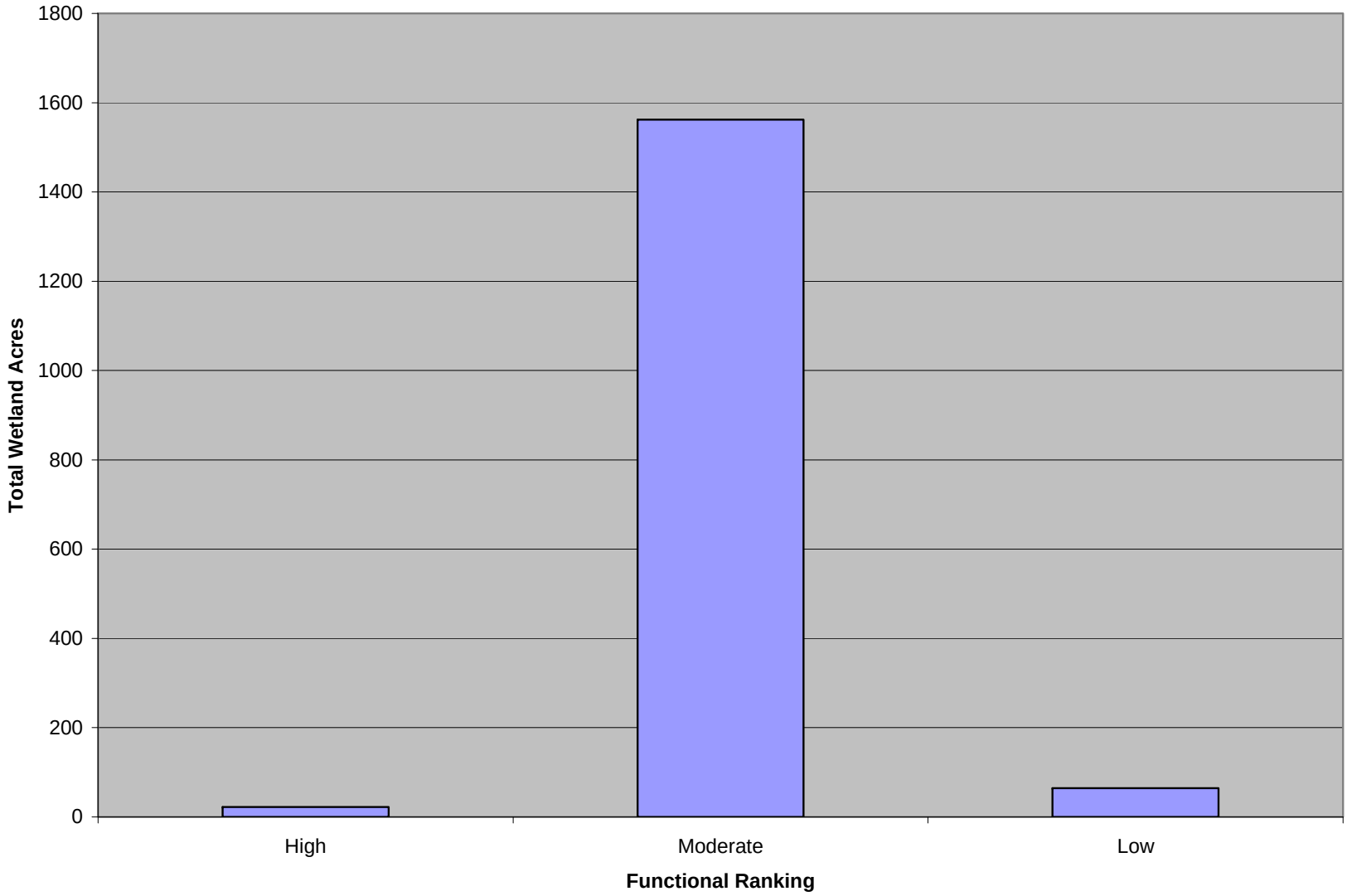


Figure 7.2-4. Cumulative Function of all 2010 Inventoried Wetlands for Downstream Water Quality

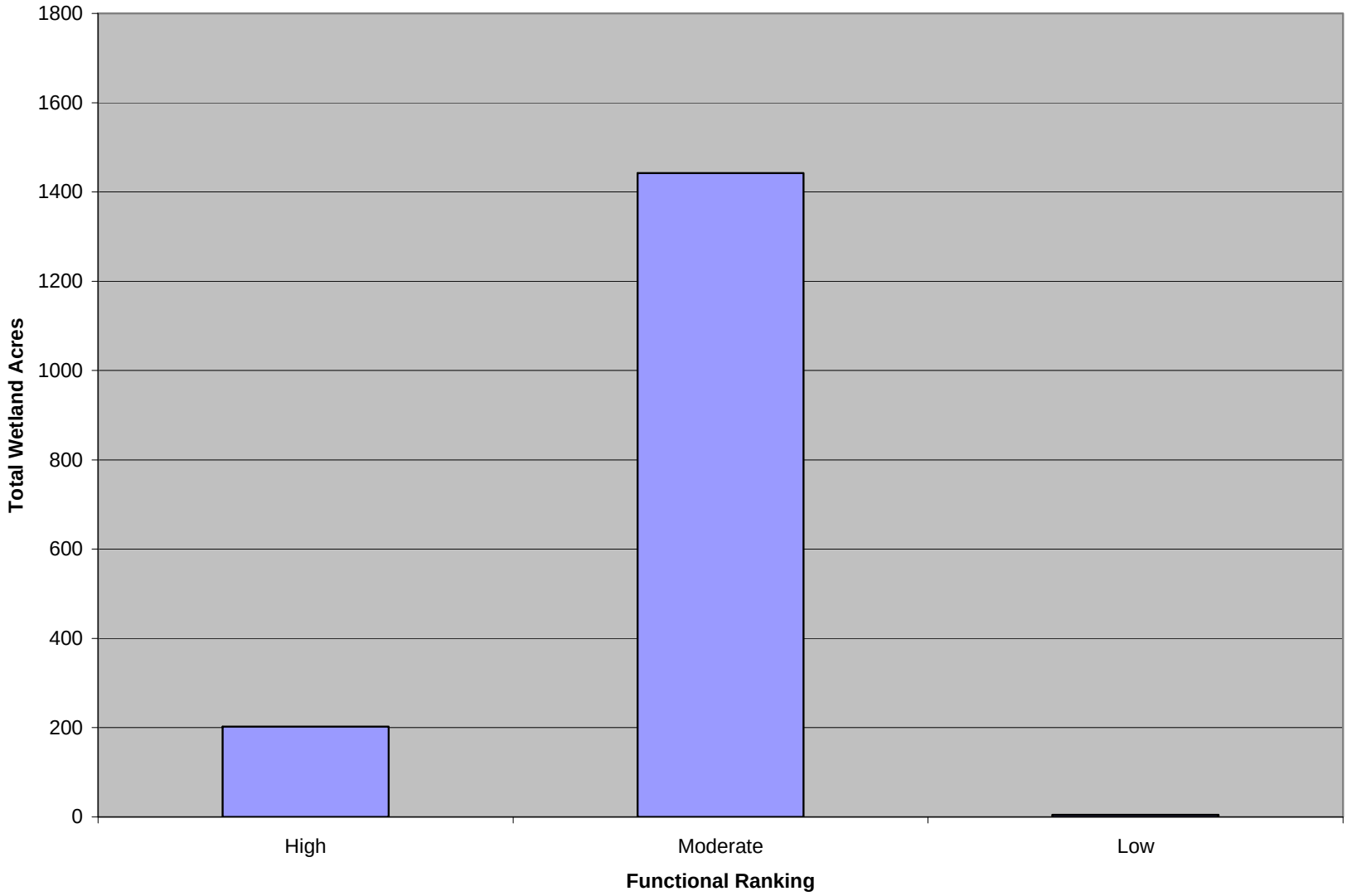


Figure 7.2-5. Cumulative Function of all 2010 Inventoried Wetlands for Maintenance of Wetland Water Quality

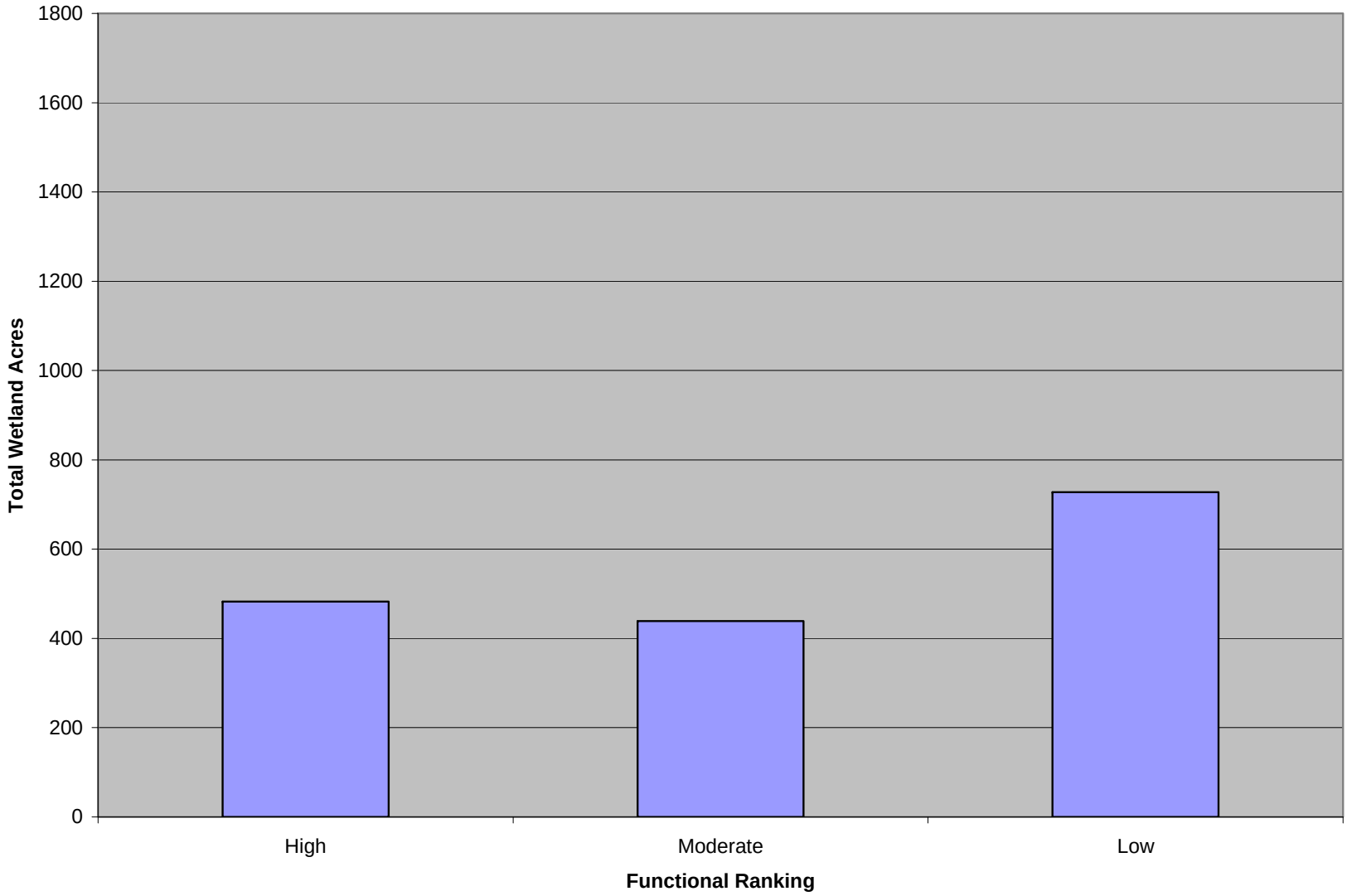


Figure 7.2-6. Cumulative Function of all 2010 Inventoried Wetlands for Maintenance of Characteristic Wildlife Habitat

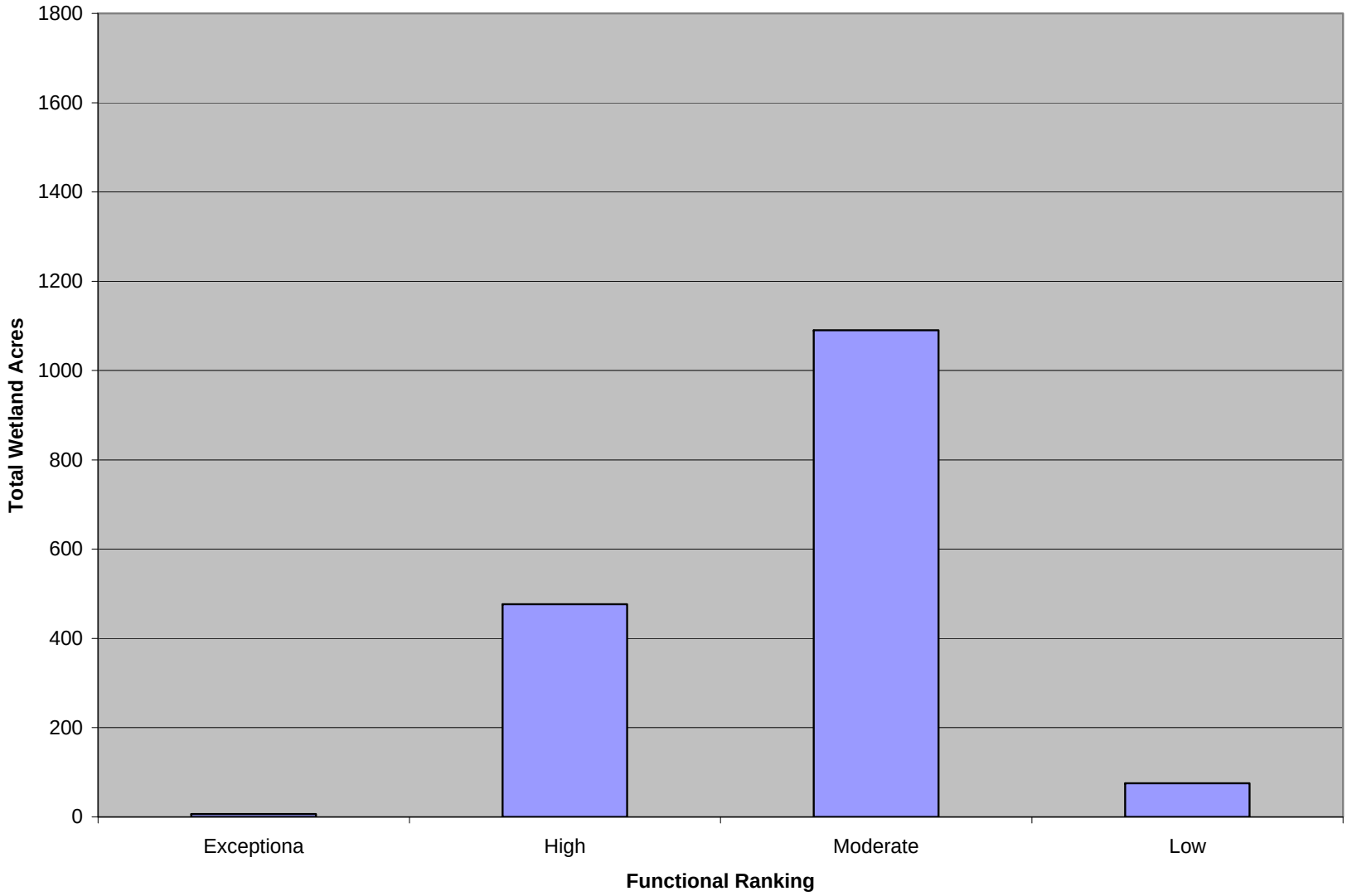


Figure 7.2-7. Cumulative Function of all 2010 Inventoried Wetlands for Groundwater Interaction