

# WI WETLAND CONSERVATION TRUST

(IN-LIEU FEE MITIGATION PROGRAM)

# INSTRUMENT



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2014

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WI Department of Natural Resources



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## Acronyms and Abbreviations

Throughout this Instrument the below acronyms and abbreviations are frequently utilized and therefore to improve ease of reading this list has been made readily available as a reference.

**AWP** – Advanced Watershed Planning

**Corps** – The US Army Corps of Engineer’s St. Paul District

**CPF** – Compensation Planning Frameworks

**DNR** – Wisconsin Department of Natural Resources

**DOT** – Wisconsin Department of Transportation

**EPA** – United States Environmental Protection Agency

**GIS** – Geographic Information System

**HUC** – Hydrologic Unit Code

**IP** – Wisconsin Wetland Individual Permit

**IRT** – Interagency Review Team

**NLCD** – National Land Cover Database

**OVC** – Original Vegetation Cover

**PRW** – Potentially Restorable Wetlands

**SA** – Service Area

**RAM** – Rapid Assessment Methodology

**RFP** – Request for Proposal

**USGS** – United States Geological Survey

**WF** – Wetland function

**WWCT** – Wisconsin Wetland Conservation Trust

**WWI** – Wisconsin Wetland Inventory (mapping)

## **Introduction**

The purpose of this Instrument is to establish the principles, responsibilities and standards for the creation, operation and management of the subsequently described in-lieu fee compensatory mitigation program in accordance with the listed rules and regulations.

## **Objectives**

The purpose of establishing the Wisconsin Department of Natural Resources (herein “DNR”) In-Lieu Fee Program, which shall be referred to as the WI Wetland Conservation Trust (herein “the WWCT”) is to provide an additional method of compensatory mitigation to offset unavoidable adverse impacts to wetland resources focusing on the greatest watershed need. The overall objective of the WWCT is to complete compensatory wetland mitigation projects on the ground selected through a watershed approach. Through the sale of WWCT credits the Sponsor accepts the legal responsibility to satisfy wetland compensatory mitigation requirements specified by US Army Corps of Engineers-St. Paul District permits authorized under Section 404 of the Clean Water Act, Section 10 of the River and Harbors Act and Wisconsin DNR Wetland Individual Permits (herein, “IP’s”) pursuant to Chapter 281.36, Wis. Stats. The Sponsor may also collect separate non-credit related funds including, but not limited to those resulting from supplemental environmental projects, donations and WI wetland General Permit surcharge fees.

## **Establishment**

This Instrument shall establish the DNR as the qualified WWCT Sponsor, approved to accept fees directly from permittees in exchange for providing third-party wetland compensatory mitigation that satisfies compensatory mitigation requirements for state and federal wetland permits. Through direct receipt of credit based funds from permittees the Sponsor agrees to assume responsibility for a permittee’s compensatory mitigation requirements, once that permittee has secured the appropriate number and resource type of credits from the sponsor and the permitting agencies have received documentation of the number and resource type of credits that have been secured from the Sponsor. The Sponsor may also collect separate non-credit related funds resulting from supplemental environmental projects, donations, WI wetland General Permit surcharge fees and other non-specific sources. These non-credit fees may be used to purchase additional land surrounding a project mitigation site or to otherwise enhance the area surrounding a planned or existing project mitigation site provided that the non-credit monies used do not contribute to the mitigation site plan in any way and are in no way incorporated into the planning, design, construction or maintenance of a given mitigation site. Essentially, the Sponsor may collect and use non-credit funds so long as they are not used in any way to fund any part of, or generate any credits for the WWCT Program. Any non-credit related funds will also be coded separately from credit fees and recorded separately in the required annual ledgers as described in the Financial & Credit Accounting sections.

## Operation

The Sponsor will also operate as the administrator of the WWCT and will work with stakeholders to broaden the knowledge base utilized in identifying and performing appropriate mitigation projects. As sponsor and administrator of this Program, the DNR will use a watershed approach to select, plan and complete WWCT mitigation projects in Wisconsin as detailed under each Compensation Planning Framework. While the DNR will be the WWCT Sponsor and administrator there will be a clear separation of duty and responsibility between DNR's review and approval of IP's, participation in the Interagency Review Team (herein, "IRT") for review of mitigation bank instruments and the administration of the WWCT so as to dispel any conflicts of interest. Review and approval of IP's is performed on a decentralized basis throughout the state within a series of geographic Water Districts (Northern, Southern, Eastern & Western) for which the WWCT program has no authority or role. Likewise the WWCT program and its coordinator is housed within a separate section of the DNR Watershed Bureau further broken down into the Waterways and Wetlands Section, which is separate from the regulatory program that reviews and approves IP's. The DNR's role on the IRT for review of mitigation banks and future WWCT project sites is undertaken by the Wetland Mitigation Coordinator, which is a separate position from the Wetland In-Lieu Fee Coordinator whom has no role or authority to participate in the IRT. The DNR fulfills an advisory role on the IRT in the review of WWCT project sites with the Corps serving as the team Chair maintaining ultimate approval as well as selecting the parties to represent the IRT. IRT members must disclose any interest in a proposed WWCT project or any adjacent affected properties and recuse themselves at the request of the team Chair from voting on said proposals if they have a conflict of interest. This recusal provision does not prevent a department or agency from officially supporting a proposal. The WWCT will be overseen by the DNR Wetland In-Lieu Fee Coordinator, whom has no role in reviewing or approving said permits or mitigation banks, but may engage permittees and permit authorities to discuss the WWCT details and its role as an avenue for satisfying permit conditions requiring compensatory mitigation. To further protect against perceived conflicts of interest the DNR shall draft and formalize an internal policy depicting the way in which mitigation avenues are utilized by internal state permit regulators reflecting the general hierarchy preference provisions contained within 33 CFR 332.3(b).

The permitting agencies (Corps and DNR) will determine whether use of the credits from the in lieu fee program is appropriate for offsetting wetland impacts authorized by an approved permit and will also determine the credits required to compensate for those impacts. The permitting agencies will consider comments submitted by the IRT and the public, when part of the permit review process, before approving the use of credits from the WWCT program. The Sponsor will provide the permit applicant and/or the permitting agencies with confirmation of credit availability as requested prior to a permit decision on whether to approve the permit. Once a credit is withdrawn, it cannot be used again to provide mitigation for any other purpose or project.

Through the undertaking of compensatory mitigation projects, program funds may be used for buffer areas that enhance and/or protect resource functions associated with WWCT project wetlands from disturbances or adverse impacts associated with adjacent land uses. Appropriate buffer areas may be established as part of a mitigation site plan in accordance with the 2008 Federal Mitigation Rule and the

Wisconsin Mitigation Guidelines. Approved buffer areas are eligible for credit and subject to the credit generation discussed under Released Credit Fulfillment Schedule section.

The US Army Corps of Engineers' St. Paul District (herein "the Corps" or "Corps") and representatives of the IRT as established by the Corps, shall review WWCT documents with the IRT providing comments to the Corps, whom in turn advises the DNR as the Sponsor. The Corps alone retains final authority for approval of all WWCT documents, including:

- Mitigation Site Plan contents, adequacy to meet WWCT goals and objectives and the requirements under the 2008 Federal Mitigation Rule
- Request For Proposals (herein, "RFP") – with regard to adequacy in meeting goals and objectives
- Use of advanced credits
- Crediting of mitigation sites
- Applicability of performance standards
- Approval of covenants, easements etc.
- Third party long-term management and maintenance agreements

WWCT compensatory mitigation site land acquisition and initial physical and biological improvements must be completed by the third full growing season after the first advance credit in that service area is secured by a permittee, unless the district engineer determines that more or less time is needed to plan and implement a WWCT project. If the district engineer determines that there is a compensatory mitigation deficit in a specific service area by the third growing season after the first advance credit in that service area is sold, and determines that it would not be in the public interest to allow the sponsor additional time to plan and implement a WWCT project, the district engineer must direct the sponsor to disburse funds from the WWCT program account to provide alternative compensatory mitigation to fulfill those compensation obligations.

## Service Areas

The proposed geographic area authorized to provide WWCT based mitigation includes the entire state of Wisconsin and is further broken down into twelve separate Service Areas (herein, "SA").

The SA(s) depicted in **Figure 1**, were selected to reflect consistency for Wisconsin's Wetland Mitigation Program based on the detailed 2013 Guidelines for Wetland Compensatory Mitigation in Wisconsin. They represent spatial boundaries based on watershed areas that are USGS Basin Level 3 hydrologic units corresponding to a 6-digit hydrologic unit codes (herein "HUC"). In an effort to generally provide spatially equivalent areas modifications to the HUC-6 boundaries were undertaken, which resulted in the division of the Wisconsin River HUC-6 into two distinct service areas (Upper and Lower Wisconsin) and combination of several northern HUC-6 watersheds that drain to the Great Lakes (Lake Superior). These modified HUC-6 areas divide the state of Wisconsin into 12 service areas.

**How Service Areas will be applied:**

The SA(s) will be utilized when tracking, cataloging and reporting credit fund sales and associated compensatory mitigation activities. However, the Sponsor will strive to debit or place wetland compensatory mitigation projects based on the HUC-8 watershed (**Table 1**) goals and objectives within each respective SA established through overall historical losses, permit impact trends and threats as detailed under each CPF.

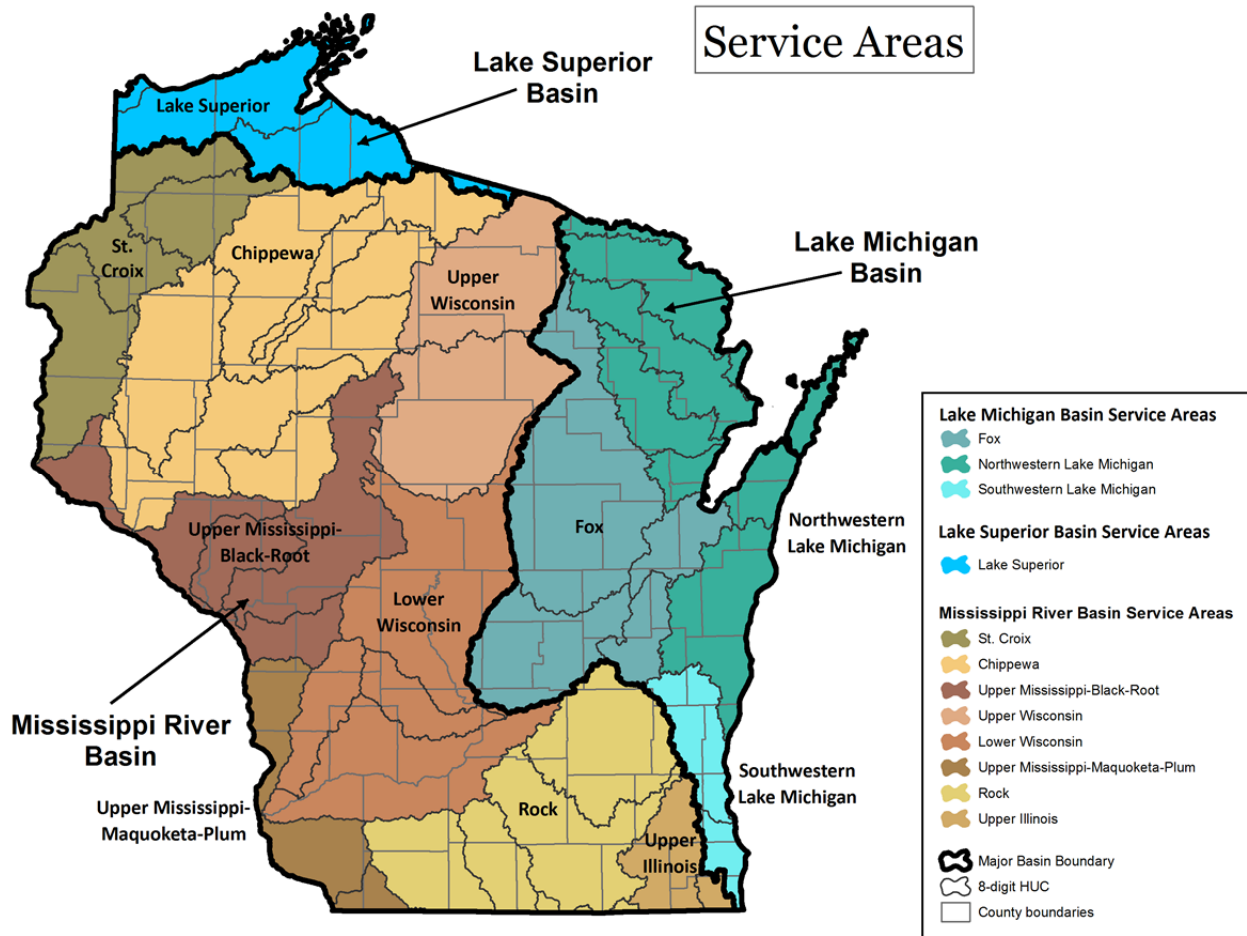
If in any given year the combined sale of WWCT credits in a SA is too small to result in a viable project then the Sponsor shall have the following options on a case by case basis with approval from the Corps:

- to combine SA credit funds with adjacent SA(s) so long as their combination does not cross a major HUC-4 basin boundary identified in **Figure 1** (i.e. Lake Michigan, Lake Superior and Mississippi River). This approach will broaden the area of consideration for siting more successful, feasible projects that benefit wetland functions while still maintaining an overall watershed approach.
- to purchase mitigation bank credits to satisfy their compensatory mitigation requirements. This option shall be accompanied by a written request from the Sponsor to the Corps that details an explanation as to why the purchase of mitigation bank credits is necessary and describe why other compensatory mitigation avenues are either not available or not feasible. Credit funds originating within the HUC-4 Lake Michigan Basin may not be combined with or result in bank credit purchases located within the HUC-4 Lake Superior Basin nor the HUC-4 Mississippi River basin and vice versa. In other words crossing these HUC-4 boundaries to purchase bank credits is not allowed.

As an alternative to program default, the Corps may grant a reasonable extension of the 3 year timeframe outlined in 33 CFR 332.8(n)(4) after consultation with the IRT, upon written request with accompanying justification from the Sponsor and after consultation with the IRT.

**Figure 1. Service Areas –**

Service Areas (SA) depicted below in 12 varying colors with corresponding HUC-6 names. Major HUC-4 basin boundaries are depicted with bold black outlines and HUC-4 Basin Names. The Ideal HUC-8 debit areas for siting projects are outlined and further described in **Table 1** below.



**Table 1. – Service Area description based on hydrologic unit codes.**

SERVICE AREAS (accounting units HUC-6)											
Lake Superior 040102+040103+040201	NW Lake Mich 040301	Fox 040302	SW Lake Mich 040400	St. Croix 070300	UMBR 070400	Chippewa 070500	UMMP 070600	Upper WI 070700-U	Lower WI 070700-L	Rock 070900	Upper IL 071200
IDEAL DEBIT AREAS WITHIN EACH ABOVE SA (Cataloging Units HUC-8)											
04010201	04030101	04030201	04040002	07030001	07040001	07050001	07060001	07070001	07070003	07090001	07120004
04010301	04030102	04030202	04040003	07030002	07040003	07050002	07060003	07070002	07070004	07090002	07120006
04010302	04030103	04030203		07030005	07040005	07050003	07060005		07070005	07090003	
04020101	04030104	04030204			07040006	07050004			07070006	07090004	
04020102	04030105				07040007	07050005				07090005	
	04030106					07050006				07090006	
	04030108					07050007					

## Need

Wisconsin has lost 46% of their estimated original ten million wetlands acres present in the 1780's leaving approximately 5.3 million acres today (**Dahl, 1990**). Historically viewed as wastelands these wetland resources were destroyed, drained or filled for agriculture, roads, cities, development and other uses relatively unchecked until 1972 with the enactment of the Clean Water Act. The loss of wetland resources has slowed significantly in the last half-century as more people have realized the suite of functions wetlands provide to the citizens of the Wisconsin and the regulatory framework has been established. The DNR established a general wetland banking program in 2002 offering compensatory mitigation credits, although wetland mitigation was not required at that time to compensate for adverse wetland impacts resulting from permitted activities. In 2008 the Department of the Army and the US Environmental Protection Agency published the Federal Rule on Compensatory Mitigation: Mitigation for Aquatic Resources (33CFR Parts 325 and 332). This rule was established to improve the effectiveness of mitigation by evaluating the strengths and weaknesses of prior mitigation efforts and setting new standards based on the lessons learned. Among other things, the rule elaborated upon requirements for In-Lieu Fee Programs, required a watershed approach to In-Lieu Fee mitigation site selection and described a general tiered preference for mitigation types.

In March of 2012 Wisconsin Governor Scott Walker signed into law 2011 WI Act 118, which for the first time requires state applicants to mitigate for unavoidable and minimized wetland impacts through an individual permit approved under Ch. 281.36, Wis. Stats. This new state compensatory mitigation

requirement carried with it a new mitigation obligation offered by three general avenues described as mitigation banks, in-lieu fee programs and permittee responsible sites. However, currently without an existing WI In-Lieu Fee Program, permit applicants are left with only two options in a state currently with very limited mitigation bank credits available in only a fraction of the service areas resulting in large mitigation gaps throughout the state. While this situation is temporary in nature as several mitigation banks are currently seeking approval, this type of lull in the available credits is likely to reoccur as banks sell out and new banks seek approvals. The current scenario is yielding permittee-responsible mitigation and out-of-service-area mitigation banking as the only avenues to satisfy compensatory mitigation requirements, in areas without approved banks having available credits contrary to the preferred options. Through the establishment of the WWCT the purpose is to provide more consistent mitigation options that better align with the preferred watershed approach resulting in an overall improvement in wetland resource function throughout the state. Having all three types of compensatory mitigation will also enable better implementation of the general preferences contained within the 2008 Federal Mitigation Rule that list mitigation banking preferred over in-lieu fee programs preferred over permitted responsible mitigation. In some instances having both mitigation banks and an active WWCT within the same Service areas will enable a system that offers wetland credits that are best suited for compensatory mitigation aimed at replacing the wetland functions based on the greatest watershed need.

As current resource pressures and future unavoidable adverse impacts evolve there will be a continual need to preserve and protect the wetlands that remain in Wisconsin and to mitigate unavoidable losses.

## Technical feasibility

The Sponsor has completed many assessments of Wisconsin's wetland resources and developed many science-based restoration and conservation plans to prioritize and guide its natural resource management decisions. Some examples are ***State of the Basin Reports*** for each of the State's major watersheds, the ***Wisconsin Wildlife Action Plan, Land Legacy Report, Wisconsin Great Lakes Strategy***, and the ***Ecological Landscapes of Wisconsin Handbook***. In 2001, the Natural Resources Board along with a newly formed DNR Wetland Team comprised of various federal and state regulatory agencies, local government, non-profits and non-governmental entities composed "Reversing the Loss" (***WI Wetland Team, 2008***) as an overall vision strategy to guide the protection, restoration and exploration of wetlands. This document also created a principle goal to reverse the loss of wetlands that Wisconsin historically experienced striving for comprehensive gains in wetland functions. This visionary document set forth to implement their strategy through "Action Plans" prepared and evaluated on a 2 year frequency that guide and prioritized what steps should be employed to achieve the goals (***WI Wetland Team 2013***). Together with science based data and stakeholder involvement these comprehensive assessments and plans will provide a foundation and direction for the WWCT's compensation planning frameworks to set prioritized objectives in each service area and establish quantifiable targets to measure project success.

The Sponsor (DNR), its public and private partners in natural resource conservation have also accomplished many projects for restoration, establishment, enhancement and preservation of wetland

resources throughout the state. The Sponsor intends to deliver high quality wetland projects by identifying the most effective partners to work with through the review of solicited proposals or preparation of internal proposals against the prioritization strategy, goals and objectives contained in the Comprehensive Planning Frameworks (herein, "CPF"). Projects may be implemented by other DNR programs or external conservation partners with the support of private consultants having extensive experience in effective restoration, establishment, enhancement, preservation, monitoring, maintenance and long-term management.

## **Ownership Arrangement & Long-Term Management**

All WWCT funded compensatory mitigation sites shall meet the requirements of Ch. 281.36(3r)(e), Wis. Stats, if applicable, as well as be protected by a recorded document that preserves the land in perpetuity with the protection instrument running with the land. In order to protect said lands the Sponsor will use fee-simple title and conservation easements, such as the DNR Wetland Compensatory Mitigation Easement (included as **Appendix G**), as its main legal mechanisms for ensuring proper perpetual protection as required. The Sponsor shall also be legally responsible for ensuring the long-term management of the WWCT mitigation sites through the creation of site specific mitigation plans that will detail the Long-Term Monitoring and Maintenance Plans for each site as required under 33 CFR 332.4 and 33 CFR 332.8. The Sponsor may sub-contract out the Long-Term Monitoring and Management of WWCT project sites to another DNR program or to another entity through solicitation of contract proposals or other approved transfer mechanisms that ensure the monitoring and management goals are met, however the responsibility remains with the Sponsor.

In addition, with Corps approval, the Sponsor may transfer ownership or management of WWCT properties on a case-by-case basis to appropriate non-profit organizations, non-governmental organizations, and state or local government entities. In the event any of the above transfers occur the Sponsor shall also transfer any reserve funds specifically set aside by the WWCT to finance the responsibilities associated with said transfer.

Likewise, upon successful transfer to another party that party shall accept full responsibility for meeting any and all long-term monitoring, management and stewardship responsibilities outlined in the approved project specific mitigation plan.

The terms and conditions of the conveyance shall not conflict with the intent and provisions of the preservation mechanism, nor shall such conveyance enlarge or modify uses specified in the protection mechanism unless explicitly approved by the Corps in consultation with the IRT.

## **Advanced Credits**

Following the Corps approval and signature of the Instrument, the WWCT may proceed with the sale of Advanced Credits and collection of all funds. Advanced Credits are defined as those credits associated with an approved in-lieu fee program that are available for sale prior to being fulfilled in accordance with an approved mitigation project. Released Credits are defined as those credits that are generated

and subsequently released from a Corps approved compensatory mitigation project site in accordance with achievement of specific milestones identified in a credit release schedule. Once previously provided advance credits have been fulfilled, an equal number of advance credits is re-allocated to the sponsor for sale or transfer to fulfill new mitigation requirements, consistent with the terms of the instrument. The number of advance credits available to the sponsor at any given time to sell or transfer to permittees in a given service area is equal to the number of advance credits specified in the instrument, minus any that have already been provided but not yet fulfilled.

The quantity of available Advanced Credits is assigned individually to each Service areas as detailed in **Figure 2**. In order to justify the quantity of Advanced Credits the Sponsor has gone through the following process:

**The first step** was to obtain 5 calendar years of full Corps data depicting all wetland permitted impacts from 2008-2012. This robust data was then stripped down to remove all temporary wetland impacts and all other data except for the permit# (for reference), HUC-6 # and permitted impact acres where compensatory mitigation was required. This pared down dataset was then utilized to calculate the annual average of permanent wetland acres impacted that required compensatory mitigation.

**The second step** was to formulate an equation that would depict the initial Advanced Credit basis for those parameters that lent themselves to a mathematical perspective. The three parameters chosen included the following:

- The past 5 year annual average in each SA of federal permanent permitted wetland acres impacted that required compensatory mitigation;
- The anticipated quantity of required compensatory mitigation for a 1 acre wetland impact based on credit ratios detailed under the 2013 WI Mitigation Guidelines. These guidelines include the WI statutory minimum 1.2:1 (credit : impact) plus a 0.25 increase reflecting potential for temporal loss of wetland functions resulting in a total anticipated ratio of 1.45:1;
- 2008 Federal Rule Requirement to initiate compensatory mitigation projects within the 3 years after selling the first Advanced Credit per SA;

**The resulting formula is:**

**Annual Average \* 1.45 Anticipated Ratio \* 3 Years = Advanced Credit Basis**

**The third and final step** after calculating the initial advanced credit basis was to then compare the numbers against a subsequent set of considerations that weigh important elements across each Service area that do not lend themselves to an established equation. These subsequent considerations were used as the final basis for the Advanced Credit resulting in either an increase or decrease from the initial basis as described below:

- Overall size and urbanization of the SA, with the larger more urbanized ones generally resulting in more advanced credits to reflect potential for increased permit activity and associated compensatory mitigation credit needs;

- Current availability of wetland mitigation bank credits in each SA, with those containing few or no active banks or those with smaller availability of bank credits resulting in an increase of Advanced Credits;
- Current permit impacts and the associated compensatory mitigation credits needs with those SA's that have increased permit activity or larger proposed projects resulting in an increase of Advanced Credits;
- Anticipated permitted impacts in SA's that are foreseen to be higher than the past 5 year annual average due to industries including, but not limited to metallic and non-metallic mining that may result in substantial compensatory mitigation needs justifying an increase of Advanced Credits.

In addition to the above process a minimum of 30 advanced credits was established for those service areas (3 SA's) where the initial advanced credit basis was very little and where the subsequent considerations did not support substantial increases. The minimum will ensure that the program has the capacity to manage projects of an adequate size relative to the preferred 25 acre minimum referenced in the 2013 WI Mitigation Guidelines. The established minimum will also enable the Sponsor to invest the time necessary to compensate for lost wetland functions due to impacts in that service area. This minimum will also enable the Sponsor to account for the potential of larger unforeseen impacts that may otherwise immediately deplete the pool of advanced credits and artificially expedite the 3 growing season time allotted for initiating projects on the ground. A smaller amount of advance credits may limit the size and scope of projects and sell out quickly thus reducing the time the sponsor has to properly vet the best projects to ensure maximum replacement of lost wetland functions.

***Figure 2. Quantity of Advanced Credits for each Service area.***

Service area	Advanced Credits
Lake Superior	75
St. Croix	30
Chippewa	50
Upper Mississippi – Black Root	50
Upper Wisconsin	100
Lower Wisconsin	40
Upper Mississippi – Maquoketa Plum	30
Northwestern Lake Michigan	100
Fox	55
Rock	90
Southwestern Lake Michigan	60
Upper Illinois	30

## **Process for Identification and Selection of Projects**

The Sponsor shall identify WWCT mitigation sites through two methods: solicitation of proposals through an open Request for Proposal (herein, "RFP") process or through an internal process utilizing the experience and expertise of other DNR staff and departments. The preference between these two

avenues is given to holding an open solicitation RFP to broaden the pool of potential projects to increase the outcomes for a successful project as well as increase engagement with stakeholders. The process for identifying and proposing WWCT sites to the Corps and IRT will be initiated by the Sponsor when there are sufficient funds to pursue development of a mitigation project or when action is required to complete land acquisition and initial physical and biological improvements by the third full growing season after the first advanced credit is sold in each SA. As WWCT sites are identified and secured the Sponsor must submit mitigation plans to the Corps that include all applicable items listed in 33 CFR 332.4(c)(2) through (14). A sample outline and format for the Sponsor's **mitigation plan** is provided in **Attachment E**.

The Sponsor and Corps shall adhere to the following process when initiating and completing the RFP process for the identification of WWCT sites and submittal of final mitigation plans to the Corps and IRT for approval.

1. RFP developed by Sponsor
  - a. Prior to issuing a **RFP** as depicted in **Appendix D**, the Sponsor shall submit a copy of the draft RFP along with any supporting documentation to the Corps and IRT for review and comment. The RFP and supporting documentation shall provide the rationale for seeking WWCT sites in the subject SA(s), the targeted wetland types and locations consistent with the respective CPF(s) and the amount of credits being sought in the subject SA(s).
2. RFP reviewed and approved by Corps in consultation with IRT
  - a. The Sponsor shall proceed with the RFP process step 3 below only after receiving written approval from the Corps that the RFP is consistent with the goals and objectives of the CPF(s) and satisfactorily addresses a demand for WWCT credits in the subject SA(s). The Corps shall provide said written approval or identify areas of deficiency no later than approximately 30 calendar days following receipt of a RFP from the Sponsor.
3. Final RFP published by the Sponsor
4. Proposals evaluated and selected by Sponsor
  - a. The Sponsor shall select sites and corresponding proposals in accordance with the prioritization strategy, goals and objectives contained under the CPF(s) for the subject SA(s) and ensure that all WWCT Mitigation Plans submitted for funding approval shall contain the twelve core elements required under 33 CFR 332.4 as reflected in **Appendix E**.
5. Corps and IRT comment on site and proposal
  - a. Prior to preparing a final mitigation plan for a selected WWCT site and proposal, the Sponsor shall provide the Corps and IRT an opportunity to review and comment on the suitability of the proposed WWCT site to satisfy the goals and objectives as outlined in the RFP. Corps and IRT comments shall be provided to the Sponsor no later than approximately 30 calendar days after Sponsor submittal of review documents.
6. Selected proposals submitted to the Corps for approval in consultation with the IRT in accordance with the review process outlined in 33 CFR 332.8(d)

- a. Following receipt of the Corps and IRT review comments, the Sponsor shall prepare final mitigation plans for the proposals it selects to pursue Corps approval for inclusion in the WWCT. Upon submitting final mitigation plans to the Corps and IRT for approval, the Sponsor shall also submit a list reflecting the mitigation sites received through the corresponding RFP process that were not selected by the Sponsor.

WWCT sites identified by the Sponsor through their internal process shall be coordinated with the Corps and the IRT by preparing a mitigation plan following the outline provided in **Attachment E**.

All proposed WWCT site reviews will be conducted in accordance with 33 CFR 332.8(d). Disbursements from the WWCT program account for acquiring and implementing initial physical and biological improvements may only be made upon receipt of written authorization from the District Engineer, after consultation with the IRT.

The strategy for prioritizing the selection and siting of compensatory mitigation projects begins by first comparing all projects of consideration against the below list of Core Requirements that detail the general project prerequisites and initial evaluation criteria common to all service areas. After projects are evaluated against these Core Requirements they will then be further prioritized, selected and sited based on the specific SA and HUC-8 goals and objectives listed under each CPF described in **Appendix A**. The Sponsor retains the sole right to make the final determination on which proposal to bring forth as a final Mitigation Plan prepared in accordance with 33 CFR 332.4(c)(1)(iii) to the Corps and IRT for funding approval. The Sponsor shall provide an accompanying list reflecting the mitigation sites received through the corresponding RFP process that were not selected by the Sponsor.

**Core Requirements:**

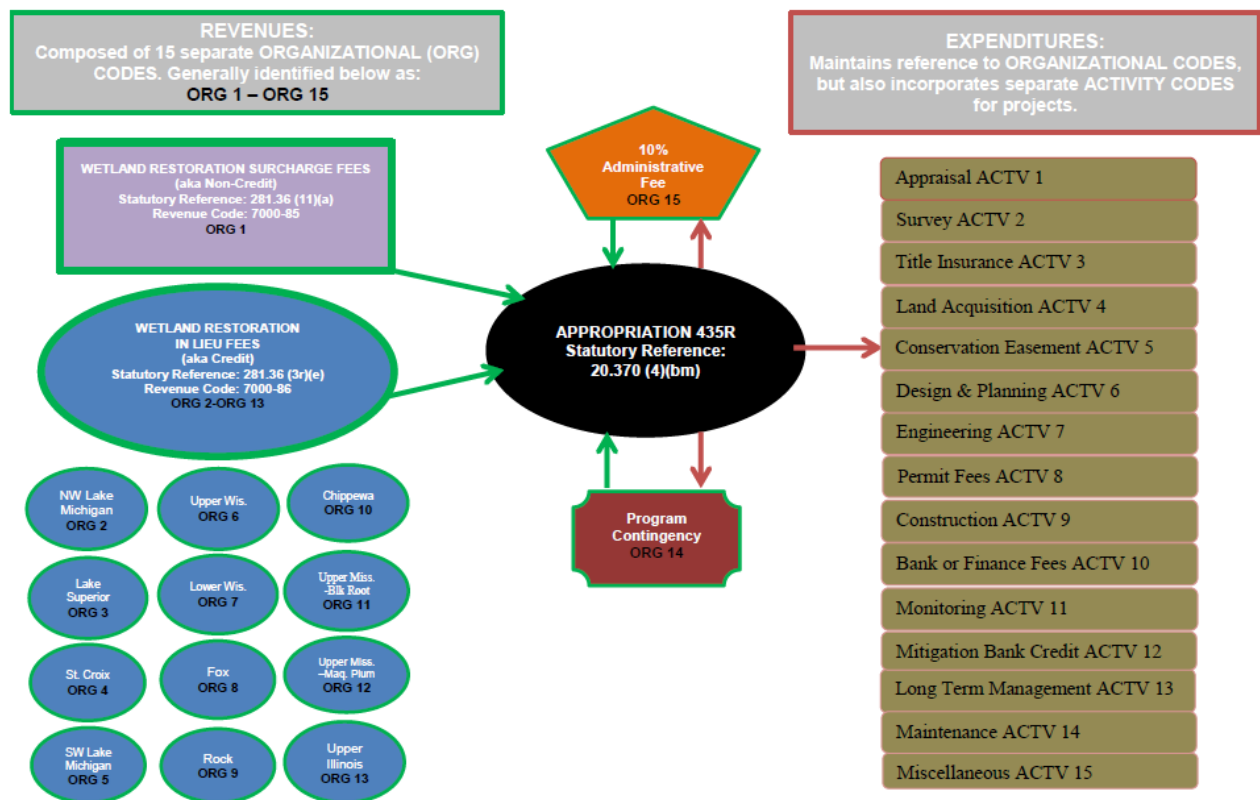
- All mitigation site proposals must contain the ability to result in a successful and sustainable net gain and/or preservation of wetland function and/or wetland area.
- All mitigation site proposals must fulfil the tenets of existing Advanced Watershed Plans (where applicable) and/or fulfil the tenets of the prioritization strategy for the corresponding SA with preference being given to AWP's. Existing AWP's are defined as those plans that were reviewed and approved by the Sponsor and Corps and are listed in the CPF specific to each SA.
- Other Evaluation Criteria may include, but is not limited to :
  - Cost, feasibility, size, proximity to other conservation lands or protected areas, connectivity or location in respect to corridors, human use value, efficient long-term maintenance, location within approved WI Natural Resource Board Boundaries.

## **Description of the In-Lieu Fee Program Account**

The Sponsor has established a separate appropriation (435) in accordance with Chapter 20.370(4)(bm), Wis. Stats. to serve as the WWCT program account and segregate it from all other state held funds. The

Sponsor shall separately track and code all money received from credit fees and non-credit related sources such as supplemental environmental projects, donations and WI wetland General Permit surcharge fees. The Sponsor will also separately track and code credit based fees to maintain their origin amongst the twelve SA's and ensure appropriate funding of wetland compensatory mitigation actions within the SA corresponding with sales of Advanced Credits. **Figure 3** visually depicts the structure of this appropriation in terms of revenue codes, expenditures, organizational codes and activity codes that will be used to separate, track and account for program financial actions. All interests accruing to the WWCT appropriation program account shall be returned to the program account annually based on the State's fiscal year ending on June 30<sup>th</sup> and will remain in that account for the purposes of providing compensatory mitigation. An Administration Fee of 10% shall be taken out of all received credit fees and coded separately to segregate it from other WWCT revenue for use on administrative based expenditures. All remaining credit based funds will only be used for the selection, design, planning, engineering, acquisition, implementation, contingency, monitoring and management of WWCT projects. Associated activities include, but are not limited to appraisals, surveys, title insurance, land acquisition, conservation easements, design and planning, engineering, permit fees, construction, bank or finance fees, monitoring, mitigation bank credits, long term management and management activities related to the restoration, establishment, enhancement, and/or preservation of aquatic and/or wetland resources. Use of credit based fees is prohibited for activities that do not directly support wetland compensatory mitigation such as upland preservation (other than buffers), research, education and outreach. The Sponsor may also set aside program revenue for a collective WWCT program contingency fund to be used when warranted to correct, repair or address catastrophic or unforeseen events that negatively impact a project site. The funding source for this contingency fund may come from credit sales or non-credit revenue and is not anticipated to exceed 10% of compensatory mitigation project costs. The Administrative fees generated will not be drawn from for the purposes of establishing this contingency fund.

The Sponsor will submit proposed WWCT projects to the Corps and IRT for funding approval and disbursements from the WWCT appropriation program account will only be made upon written approval from the Corps. Within each SA the Corps shall retain the right to direct the corresponding funds to alternative compensatory mitigation projects in the event the Sponsor does not complete land protection and/or acquisition and initial physical and biological improvements before the third full growing season after the first advanced credit in that service area is secured by a permittee, unless the district engineer determines that more or less time is needed to plan and implement a WWCT project.

**Figure 3. – Visual Depiction of Appropriation 435R WWCT Program Account**

## Fee Schedule

The credit fee charged is determined by the Sponsor and a fee schedule will be maintained for each Service Area as **Appendix B**. The cost per unit of Credit takes into account the expected costs associated with administration of the program, selection, design, planning, engineering, acquisition, implementation, contingency, monitoring and long term management of WWCT projects. Such costs are based on full cost accounting according to 33 CFR 332.8(o)(5)(ii)) and include, but are not limited to appraisals, surveys, title insurance, land acquisition, conservation easements, design and planning, engineering, permit fees, construction, bank or finance fees, monitoring, mitigation bank credits, long term management and management activities related to the restoration, establishment, enhancement, and/or preservation of aquatic and/or wetland resources. In addition, the cost may also include the cost of providing financial assurances that are necessary to ensure successful completion of WWCT Projects, and may reflect other factors as deemed appropriate by the Sponsor and the Corps in consultation with the IRT.

## Credit Fee Methodology

The WWCT shall establish an inaugural credit fee, which will be evaluated going forward by the Sponsor on an annual basis following submission of the required annual reports to the Corps with any credit fee changes posted on the Sponsor's website or otherwise made available to the public. Since the WWCT is the first in-lieu fee program in Wisconsin baseline costs to establish a meaningful true cost accounting calculation of these future expenditures was based on the current costs associated with mitigation

banks and permittee responsible mitigation projects in WI. The Sponsor evaluated the total construction and monitoring costs for these types of projects to establish an estimated total construction and monitoring cost. The Sponsor also utilized land sales data prepared by the U.S. Department of Agriculture specific to 9 separate districts that span WI to provide the basis for land cost (**USDA 2012**). These two costs provide the foundation for the credit fee method, which also considers the estimated long-term maintenance, contingency and administrative costs when ultimately setting the credit fee. Since adjacent Service Areas have the possibility to be combined under limited circumstances within the context of major HUC-4 basins the Sponsor has set the inaugural credit fee the same within these areas as seen in **Appendix B**.

The Sponsor also reviewed other national in-lieu fee programs as well as the Wisconsin based market value of wetland compensatory mitigation bank credits fees to cross check the proposed credit fee method and verify the results. Wisconsin has had a mitigation banking credit market since 2002 providing a strong baseline market for establishing a comparable WWCT credit fee. The current market value for mitigation bank credits ranges from \$45,000 to \$60,000 depending on location of the state as well as market demand for credits representing a similar basis as the Sponsor's proposed method results. A review of national in-lieu fee programs found a very wide range of credit fees from approximately \$30,000 in Kentucky to \$600,000 in Virginia and therefore, the WI based market value provided a more focused comparison.

The Sponsor reserves the right to alter the credit fee annually going forward as well as have different credit fees in each service area to account for variable costs such as land values. Any modification to the fee performed by the Sponsor shall not constitute a modification to the Instrument or program in accordance with 33 CFR 332.8(o)(5). The Sponsor shall provide written notification to the Corps that will include, at a minimum, justification for any change with regard to the credit fees.

### **Financial Accounting**

The WWCT appropriation 435 program account, authorized under Chapter 20.370(4)(bm), Wis. Stats., will track and code revenue accepted from permittee credit purchases separately from those accepted from other sources as identified under the WWCT Account section. Once the WWCT accepts payment from a permittee the responsibility for compensatory mitigation shall transfer from the permittee to the WWCT Sponsor therefore satisfying the permittee's legal responsibility for compensatory mitigation.

### **Credit Accounting**

The Sponsor shall utilize a ledger to account for all credit activity and report annually on advanced credit sales, available advanced credits, project credit generation, advanced credit fulfillment and compensatory mitigation liability. An example of the ledger is contained with **Appendix C**.

All books, accounts, reports, files and other records relating to the WWCT Account will be made available at reasonable times for inspection and audit by the Corps upon written request.

### **Released Credit Fulfillment Schedule**

WWCT program released credits will generally be calculated as described in the **2013 WI Mitigation Guidelines** or any subsequent guidance documents that represent updates or revisions to this original guidance document going forward. These guidelines have been vetted through the public comment process and represent an approved joint guidance document between the Corps and DNR. The final approved quantity of credits generated as part of a mitigation projects shall be approved by the Corps as part of the Mitigation Plan. All credits released from an approved compensatory mitigation site shall first go towards fulfilling all Advanced Credits sold in the corresponding SA to replenish the quantity available for sale.

Each WWCT approved project Mitigation Plan will include a credit release schedule reflecting achievement of performance standards and in general credits shall be release according to the schedule reflected in the **2013 WI Mitigation Guidelines** or subsequent guidance documents as described above.

**The fulfillment schedule of Released Credits for compensatory project sites that employ Preservation is as follows:**

100% - Upon Corps approval of Mitigation Plan, Long Term Monitoring and Maintenance Plan and receipt of signed recorded conservation easement or other perpetual legal protection document.

If in any case a mitigation site includes preservation and another mitigation method (i.e. restoration, enhancement, establishment, etc.), all aspects of the preservation area will be handled separately.

## **Default and Closure Provisions**

### **Default**

Authorization to sell credits to satisfy compensatory mitigation requirements in authorized permits is contingent on compliance with all of the terms of this Instrument. If the Sponsor is unable to meet any of the requirements under this Instrument, it shall provide written notification to the Corps within 30 days of the failure to meet any of the requirements, stating the reason for the failure. The Corps will consult with the Sponsor and the IRT to consider modifications to the Instrument including adaptive management, revisions to the credit release schedule, and alternatives for providing compensatory mitigation to satisfy any credits that have already been sold. The Corps will, however, take into consideration acts, events, or conditions beyond the Sponsor's reasonable control that may have been the primary cause of the failure.

If the district engineer determines that the in-lieu fee program is not meeting performance standards or complying with the terms of the instrument, appropriate action will be taken. Such actions may include, but are not limited to, suspending credit sales, adaptive management, decreasing available credits, utilizing financial assurances, and terminating the instrument.

### **Closure**

The Sponsor or the Corps may terminate this Instrument following a 90 day written notice to the other party. Following submission of either party's intent to terminate the following closure provisions shall commence:

- The sale of credits shall cease immediately, unless the sale of credits is approved in writing by the Corps.
- Within 90 days, the Sponsor shall provide a report detailing:
  - An accounting of all program funds, including funds remaining and outstanding obligations.
  - The status of all compensatory mitigation projects previously approved by the Corps, including the number of credits released, the remaining projected number of credits that may be generated by each project and the extent to which each site is meeting the performance standards.
  - A plan for ensuring that the functions provided by any previously released credit from an approved project will be maintained or replaced. Such measures may include continued maintenance in accordance with a conservation easement, completion of the compensatory mitigation project (and associated monitoring), or the provision of alternative compensatory mitigation.
- The Corps, after consulting with the IRT, will determine if the measures proposed by the Sponsor are adequate and determine the final closure plan for the in lieu fee program.
- If any released credits have been generated and subsequently released from a project site in order to fulfill previously sold advanced credits, then the conservation easement on the site shall remain in effect in perpetuity unless mitigation acceptable to the Corps has been provided for the sold advanced credits and an amendment of the easement is agreed to in writing by the Corps. If no released credits have been generated and subsequently released from the site, the conservation easement may be vacated with written approval from the Corps.

### **Fund Allocation and Remaining Obligations**

Any remaining program funds after the above closure obligations have been satisfied shall remain in the WWCT Program account to be used for compensatory mitigation purposes given that the Corps cannot directly accept, retain or otherwise draw upon program funds in the event of closure or default.

Appropriate use of these remaining funds by the Sponsor shall include, but not be limited to further compensatory mitigation activities, purchase of mitigation bank credits, or disbursement of funds to another qualified entity such as a governmental or non-profit natural resource management entity for the sole purpose of performing wetland compensatory mitigation.

### **Reporting Protocols**

#### **Monitoring Reports**

The Sponsor shall submit monitoring reports for all approved projects to demonstrate whether the project is meeting performance standards or if additional actions are required to fulfill objectives. The template WWCT Mitigation Plan attached as **Appendix E** contains a monitoring report section as well as

performance standards discussion as a general frame of reference. The monitoring reports shall be submitted to the Corps on an annual basis on or before December 31<sup>st</sup> throughout the specific monitoring period for each project, which shall generally correspond with the previous growing season.

### Credit Transaction Reports

The terms of this Instrument establish that through direct receipt of credit based funds from permittees, the Sponsor accepts the legal responsibility to satisfy wetland compensatory mitigation permit requirements. An affidavit of compensatory mitigation credit purchase template is provided as **Appendix F**, to depict the required information that will be captured as part of these transactions. The Sponsor shall provide a copy of each signed affidavit to the Corps within 30 days of receiving the corresponding permittee credit fees.

### Annual Program Reports

The Sponsor shall provide annual reports to the Corps and the IRT on or before December 31<sup>st</sup> reflecting account and program activity for the previous Wisconsin State Fiscal Year, which begins on July 1<sup>st</sup> and ends on June 30<sup>th</sup>. These annual reports will also be made available to the public upon request or they may be posted on the Sponsor's website.

A single comprehensive annual report shall be compiled and submitted by the Sponsor as reflected in **Appendix C**; however certain portions of the report may be prepared by financial staff, while others will be prepared by WWCT Program staff to ensure proper reporting, tracking and coding.

Portion of Annual Reports prepared by WWCT Staff and information captured on the ledger:

- A list of all bills of sales or similar tracking mechanism for which WWCT credit revenue was accepted further broken down to depict the:
  - Corps permit number, State permit number;
  - Service Area name and overall HUC-4 name in which the unavoidable permitted impacts occurred;
  - Overall HUC-4 number, modified HUC-6 number and HUC-8 number in which the unavoidable permitted impacts occurred;
  - Latitude and Longitude of the unavoidable permitted impact location;
  - Township, Range, Section and county of the unavoidable permitted impact location;
  - Wetland Classification impacted according the eleven communities defined in ***The 2013 WI Wetland Compensatory Mitigation Guidelines*** as referenced in ***Eggers and Reed 2011***;
  - amount of authorized impact in acres to the nearest 100<sup>th</sup> decimal place (i.e. 0.01 acres);
  - amount of required WWCT compensatory mitigation to the nearest 100<sup>th</sup> decimal place;
  - amount of credit revenue received, tracked per Service area and;
  - date actual credit revenue from permittee was received by the WWCT;
- The balance of advanced credits and released credits at the end of the report period for each Service area; and
- Any other information required by the Corps requested in written form.

Portion of Report prepared by State Financial Staff and information captured:

- All revenue received and interest earned by the WWCT Account;
- Separate accounting for credit and non-credit revenue;
- Separate accounting for revenue / expense activity within each SA;
- Separate accounting for overall Administrative revenue / expenses; and
- Separate accounting for overall Contingency revenue / expense.

### **Statement Regarding Legal Liability**

The Sponsor shall establish and operate the WWCT program under the tenets that the legal responsibility for providing the compensatory mitigation lies with the Sponsor once a permittee secures credits from the Sponsor as demonstrated by a signed affidavit (Appendix F).

### **Miscellaneous Provisions**

#### **Credit Resale, Brokerage and Stockpiling**

Once an Advanced or Released Credit is sold by the Sponsor it may not be resold, brokered or otherwise transferred to another entity nor may either type of credit be stockpiled or divided by an entity for later use without the express written approval of the Sponsor and Corps in consultation with the IRT. Credit sales are only eligible for entities having a current need to perform wetland compensatory mitigation in order to satisfy an active legal permit requirement. Therefore, all purchase confirmation letters and/or credit affidavits for credit transactions must include a permit number verifying a valid transaction. The Sponsor also retains the sole right to refuse credit sales to any entity, permittee or party at any given time. The Sponsor, with the approval of the Corps in consultation with the IRT, has the sole discretion to determine if a refund of credit purchase is warranted in response to purchaser request provided the permitted adverse wetland impacts have not taken place and will not occur and the legal requirement to perform compensatory mitigation is no longer required. If said refund is approved and performed the Sponsor shall no longer have the legal responsibility to perform the corresponding wetland compensatory mitigation.

#### **Legal Conditions**

This Instrument shall be governed by and construed in accordance with the laws of Wisconsin and the United States as appropriate.

In the event of a disagreement involving the Corps, members of the IRT, and/or the Sponsor, the Corps will make the final decision after considering all opinions.

US ACE approval of this Instrument constitutes the regulatory approval required for the Wisconsin Wetland Conservation Trust In-Lieu Fee Program Instrument to be used to provide compensatory

mitigation for Department of the Army permits pursuant to 33 C.F.R. 332.8(a)(1). This Instrument is not a contract between the Sponsor or Property Owner and USACE or any other agency of the federal government. Any dispute arising under this Instrument will not give rise to any claim by the Sponsor or Property Owner for monetary damages. This provision is controlling notwithstanding any other provision or statement in the Instrument to the contrary.

**Severability:** In the event any one or more of the provisions contained in this Instrument are held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability will not affect any other provisions hereof, and this Instrument shall be construed as if such invalid, illegal or unenforceable provision had not been contained herein.

Any obligations of the United States Government set forth in this Instrument are subject to and dependent on the appropriation and allocation of sufficient funds for those purposes.

The Sponsor is responsible for the implementation, long-term management, and any required remediation of the restoration, establishment, enhancement, and/or preservation activities, even though those activities may be conducted by other parties through requests for proposals or other contracting mechanisms.

**Modification:** Modification of this Instrument, including the addition or expansion of project sites, shall follow the procedures in 33 C.F.R. § 332.8(d) unless the Corps determines that the streamlined review process in 33 C.F.R. § 332.8(g)(2) is appropriate. The streamlined review process may be appropriate for changes reflecting adaptive management of the in-lieu fee program, credit releases, changes in credit releases and credit release schedules, and changes that the Corps determines are not significant.

Each mitigation project must comply with all applicable federal, state, and local laws.

No third party shall be deemed a beneficiary of this Instrument and no one except the signatories of this Instrument, their successors and assigns, shall be entitled to seek enforcement of this Instrument.

**Notice:** All notices and required reports shall be posted in the Regulatory In-lieu fee and Bank Information Tracking System (RIBITS) or sent to each of the parties at their respective addresses, provided below, unless a different address is specified in writing. Electronic communication is preferred, unless an alternative method of communication is agreed to.

**Sponsor:**

Wisconsin Department of Natural Resources  
Wetland In-Lieu Fee Coordinator  
141 NW Barstow St., Rm 180  
Waukesha, WI 53188

**Corps:**

Chief, Regulatory Branch  
St. Paul District

U.S. Army Corps of Engineers  
180 Fifth Street East, Suite 700  
St. Paul, MN 55101-1678

As used herein, the term “Instrument” includes the approved project site plans that have been incorporated into the Instrument through the modification process described in **Modification** provision detail above.

Entire Agreement: This Agreement constitutes the entire agreement between the parties concerning the subject matter hereof and supersedes all prior agreements or undertakings.

Headings and Captions: Any paragraph heading or captions contained in this Agreement shall be for convenience of reference only and shall not affect the construction or interpretation of any provisions of this Agreement.

Counterparts: This Agreement may be executed by the parties in any combination, in one or more counterparts, all of which together shall constitute but one and the same instrument.

Binding: This Agreement shall be immediately, automatically and irrevocably binding upon the parties and their heirs, successors, assigns and legal representatives upon execution.

Transfer of Mitigation Responsibility: For projects in the service area of this Program that require Department of the Army authorization pursuant to Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, Chapter 281.36, Wis. Stats , if such authorizations require compensatory mitigation, Credits from this Program may be used to satisfy those compensatory mitigation requirements if the WWCT and the permittee reach a mutually acceptable financial agreement, subject to Corps and/or DNR written approval on a case-by-case basis.

Approvals: For purposes of this Agreement, any approval required hereunder must be in writing and expressly approve the action or other matter for which approval is sought. Written approval may be transmitted in accordance with the **Notice** provision detailed above.

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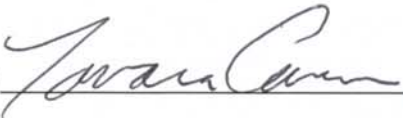
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**Signatures:**

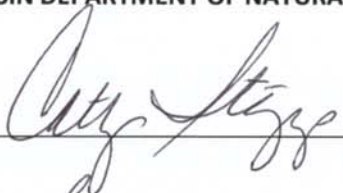
**U.S. ARMY CORPS OF ENGINEERS**

By: 

Its: Regulatory Branch Chief (Title), St. Paul District

Date: 11/19/2014

**WISCONSIN DEPARTMENT OF NATURAL RESOURCES**


By: 

Its: Secretary (Title)

Date: 11-19-14

November 12, 2014

**U.S ENVIRONMENTAL PROTECTION AGENCY (IRT MEMBER)**

By: 

Its: Regional Administrator (Title)

Date: 11/19/2014

November 12, 2014

## Appendix A. - Compensation Planning Framework

The Compensation Planning Framework (herein, “CPF”) is the main decision tool specific to each Service Area that serves to guide the selection, securement, planning and implementation of wetland restoration, establishment, enhancement and/or preservation activities through a watershed approach. The CPF’s are based on a HUC-6 watershed area to be manageable in size and promote the watershed approach. Several components of the CPF’s are in part based on “Level 1” watershed assessment, as defined by EPA’s National Wetlands Monitoring Workgroup (*U.S. EPA 2006*), where existing data are used within a computer mapping (Geographic Information System, herein “GIS”) environment. This is a first filter for identification and comparison of resource conservation needs and opportunities utilized to guide investment toward compensatory wetland mitigation sites that are most likely to result in wetland function gains by comparing their relative potential across an entire watershed. Additionally, planning documents that have been prepared through extensive expert consultation, peer scrutiny and subjected to review through the public arena were also utilized in the preparation of the CPF’s, especially in those areas where GIS information was found to be scarce.

The CPF consists of ten elements listed below for reference, which are required under 33 CFR 332.8(c) along with any additional information deemed necessary by the Corps:

- I. **Service Areas** - The geographic service areas, including a watershed-based rationale for the delineation of each;
- II. **Threats** - A description of the threats to wetland resources in the service areas, including how the WWCT will help offset impacts resulting from those threats;
- III. **Historic Loss** - An analysis of historic wetland resource loss in the service areas;
- IV. **Current Conditions** - An analysis of current wetland resource conditions in the service areas, supported by an appropriate level of field documentation;
- V. **Goals and Objectives** - A statement of the wetland resource goal and objectives for each service area, including a description of the general amounts, types and locations of wetland resources the WWCT will seek to provide;
- VI. **Priorities** - A prioritization strategy for selecting and implementing compensatory mitigation activities;
- VII. **Preservation** - An explanation of how any preservation objectives identified in section V. above and those references under the prioritization strategy of section VI. Above satisfy the criteria for use of preservation;
- VIII. **Stakeholder Involvement** - A description of any public and private stakeholder involvement in plan development and implementation, including, where appropriate, coordination with federal, state, tribal and local wetland resource management authorities;
- IX. **Protection** - A description of the long-term protection and management strategies for activities by the WWCT Sponsor;

- X. **Evaluation and Reporting** - A strategy for periodic evaluation and reporting on the progress of the program in achieving the goal and objectives in section V. above, including a process for revising the CPF as necessary.

When considering the ten CPF elements there are some that can be applied across all service areas to provide a consistent programmatic approach while others need to be applied more specifically within each respective service area. In consideration of providing uniformity, general elements common to all service areas are discussed below while the remaining detailed elements are specifically addressed within **Appendix A.** for each SA. Likewise, information on how each element was prepared is described below as a precursor to the detailed discussions within the CPF's.

### **Element I. Service Areas**

This portion of the CPF is described under the Service Areas section of the Instrument above this section as well as described in detail within the CPF for each SA as Element I.

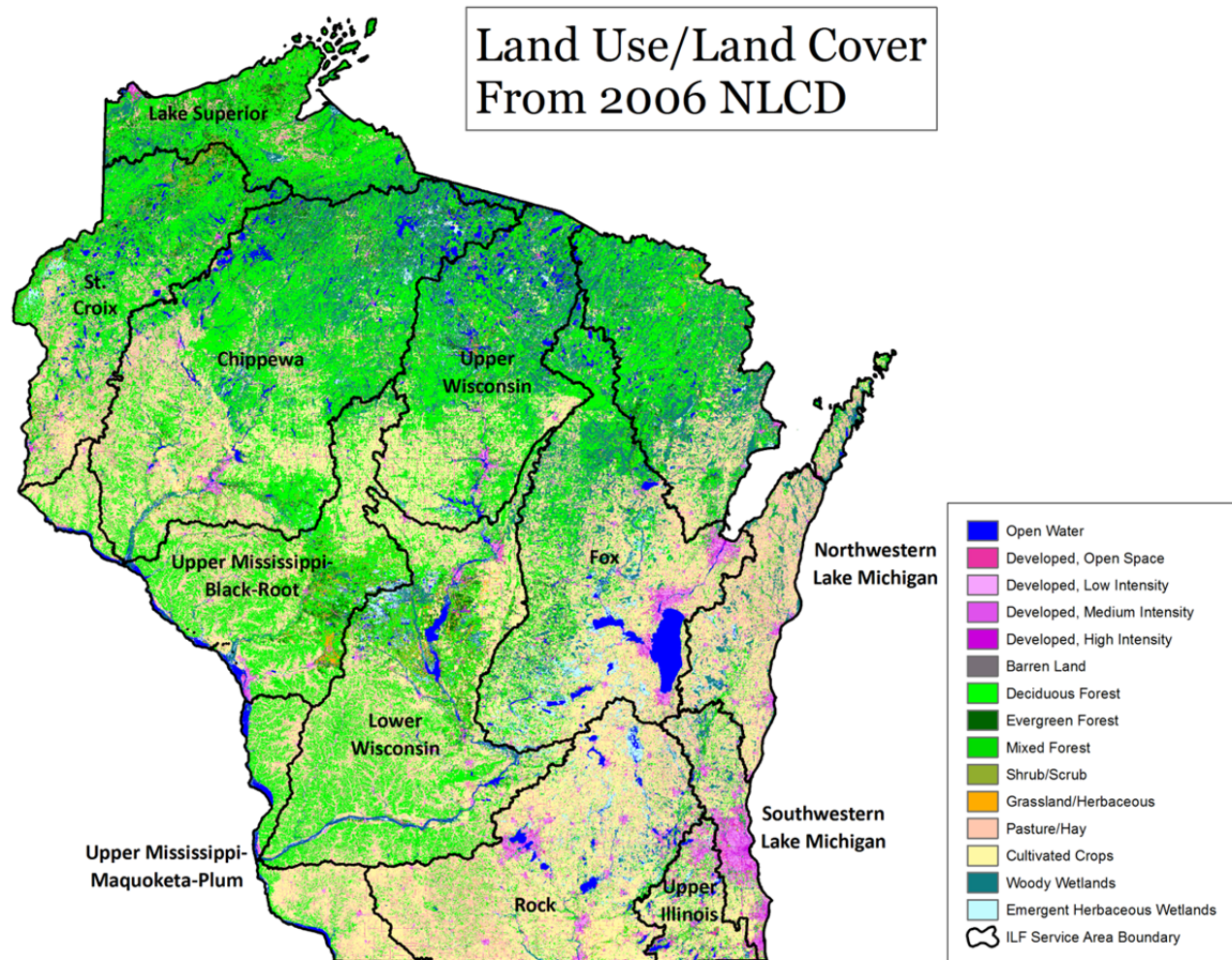
### **Element II. Threats and Remediation**

Threats to wetlands described below are broadly categorized not based on their origin of impact, but rather the resulting effect that removes or adversely alters the wetland resources' capability to provide one or more functions. Wetland resource threats are dynamic in nature subject to modification as new technology and approaches to anthropogenic land use occurs within each watershed area. Arguably every watershed is in need of wetlands and their associated functions, however through the evaluation of the Level 1 watershed assessment the Sponsor has strived to prioritize the wetland type of greatest need based on historic loss, permit trends and threats. It is also important to target wetlands suffering from threats that are capable of sustainable curative action. Below is a list and description of the greatest historical, current and future anticipated generalized threats for which the WWCT will work to bring positive change beneficial to increasing functions through the goals and objectives of the CPF.

**Habitat Segmentation and Loss** – General development land use activities (**Figure 4.**), agriculture, roadways, bridges and utility projects have fragmented many wetland complexes and introduced anthropogenic barriers to wildlife corridors and adversely impacted wetland hydrology. Most species require wetlands for a portion of their life cycle for stages of their growth, migratory safe havens, feeding grounds or full time residency. Habitat segmentation and loss can also be a contributing factor for the introduction of invasive species through increased pathways of introduction. Filling of wetlands can also increase peak flows and cause flooding and erosion. The WWCT through its CPF's will identify the watershed areas that have been heavily impacted by historic loss, permit trends and threats, then utilize this collective information to target wetland compensatory mitigation projects that provide or connect wetland habitat areas to form meaningful wildlife, fish and aquatic organism territories. The WWCT will also utilize areas identified on the Joint Venture Plan and WI Wildlife Action Plan for Species

of Greatest Conservation Need amongst other overarching planning documents to help select project proposals for implementation.

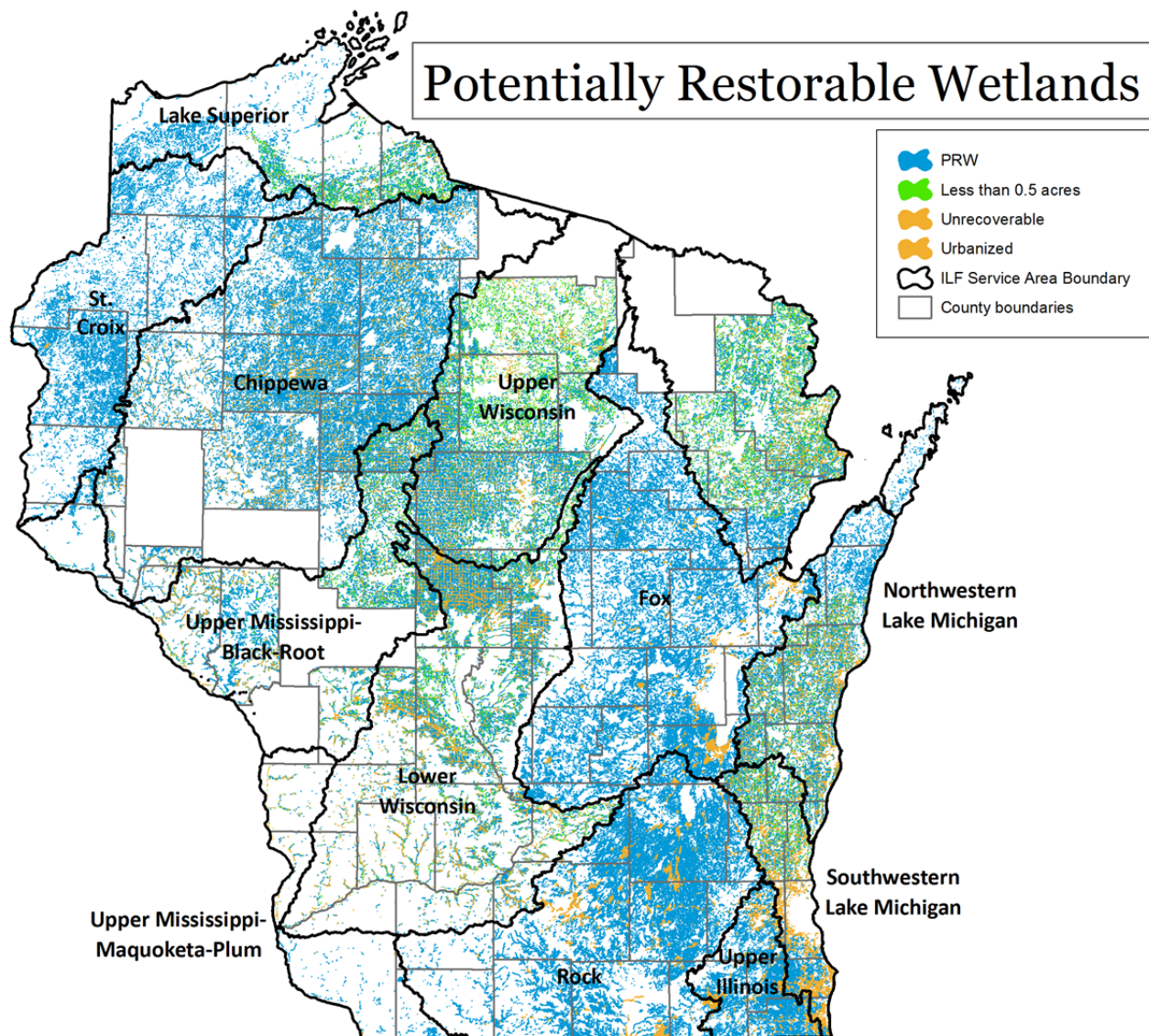
**Figure 4. Current Land Cover for Wisconsin** – Based on the USGS NLCD 2006 GIS Layer.



**Agricultural Impacts** – Wisconsin has a history and tradition of agriculture, which has led to many adverse impacts to wetlands once thought of as wastelands best served as drained, tilled and farmed. Wetlands being composed of organic soils providing ideal production lands had their wetland based hydrology removed or altered and the vegetation transformed to row crops or pasture lands. Large tracts of wetland vegetation now sit empty for portions of the year leading to increase non-point runoff contributing to the sedimentation and nutrient loading of waterways and their associated wetlands. These areas are treated with herbicides and fertilizers that runoff into the same resources further leading to harmful environmental effects. The WWCT through its CPF's will identify the watershed areas that have been heavily impacted by agricultural threats and target wetland compensatory mitigation projects in areas containing high and moderate percentages of Potentially Restorable Wetlands (**Figure 5.**) or similar areas composed of hydric soils that once housed wetland complexes that have been previously converted for agricultural purposes. Through the restoration and enhancement of these

Potentially Restorable Wetland acres the WWCT will reduce the annual nutrient loading of these parcels, enable them to store more rain events, bring back the hydrophytic vegetation to stabilize the soils reducing runoff and provide habitat.

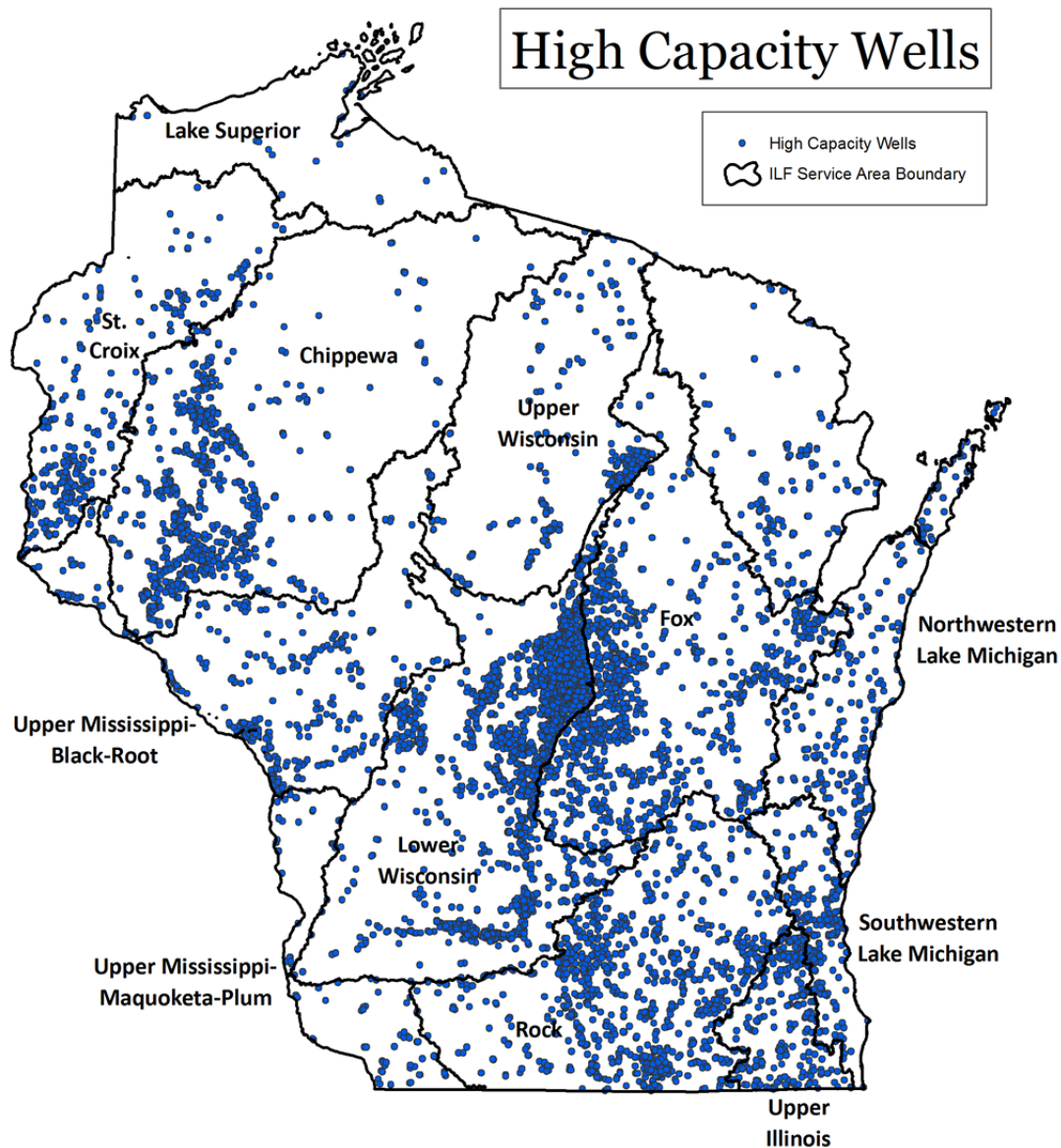
**Figure 5. – Potentially Restorable Wetlands shown in each Service Area.**



**Groundwater Depletion & Surface Water Alteration** – General development and its associated activities along with agricultural practices have negatively impacted wetland hydrology. Resource fragmentation, floodplain alteration, impervious surfaces, tiles and drainage ditches have removed, redirected or increased water flow to wetlands. High capacity wells used for drinking water, commercial use, industrial processes and irrigation have also depleted groundwater that feeds wetlands throughout the state with some areas seeing heavier impacts than others (**Figure 6.**). The alteration of surface water, increase in impervious areas and reduction in the ability of wetlands to attenuate storm events has resulted in increased flooding in many areas. Wetlands located in stream headwaters or riparian areas

that have been filled or had their hydrology altered have reduced stream base flow, increased thermal impacts and may cause perennial streams to revert into an intermittent state. The WWCT through its CPF's will identify the watershed areas that have sustained wetland loss from historic settlement, permit trends and threats. This information will be used to target wetland compensatory mitigation projects where altered hydrology can be remediated for the wetland types of greatest need, paying particular attention to the wetlands landscape position to achieve maximum function benefits.

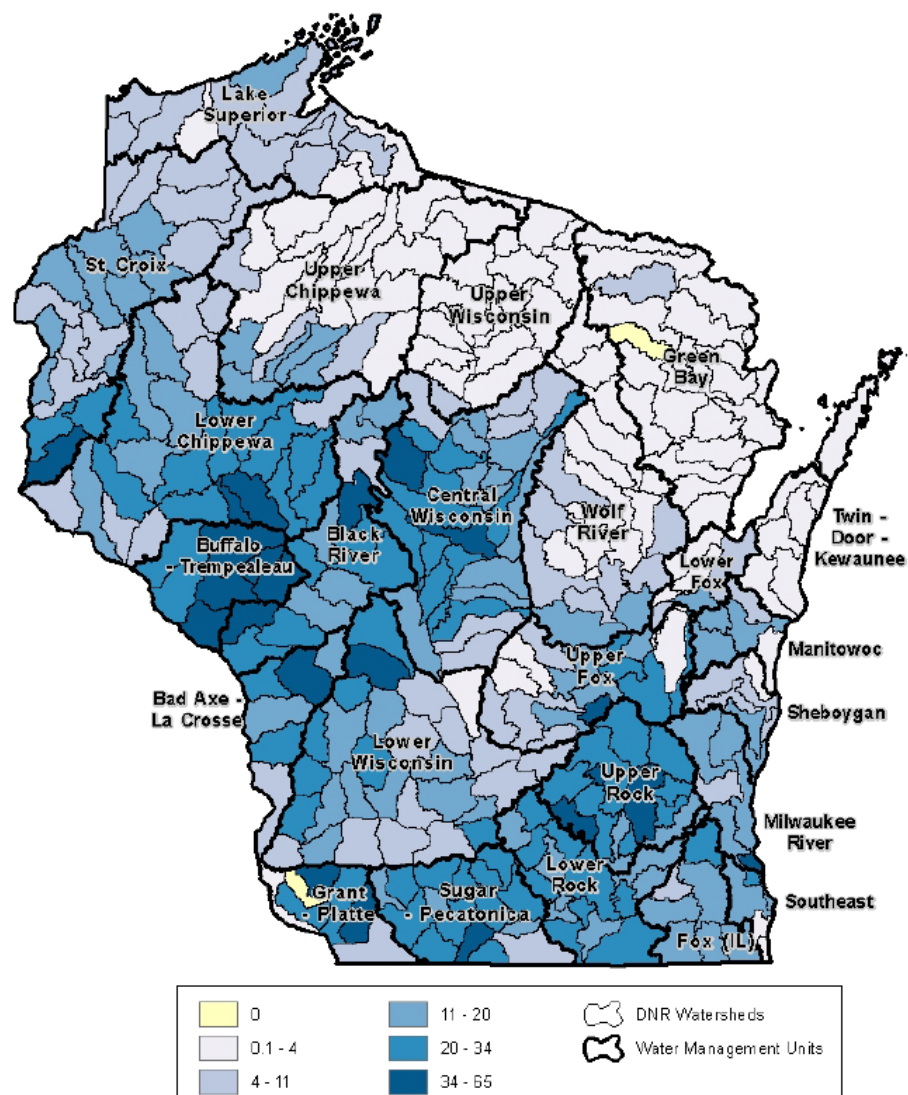
**Figure 6. Statewide Existing High Capacity Wells with a capacity exceeding 100,000 gallons per day.**



**Invasive Species** – Anthropogenic interference in the realm of wetlands has opened many pathways for the introduction of invasive species. Removal of native vegetation, habitat segmentation, altered hydrology, general development, commerce and agricultural activities have created ideal situations for invasive species to gain a foot hold in wetland areas and thrive. Modification of streams and their

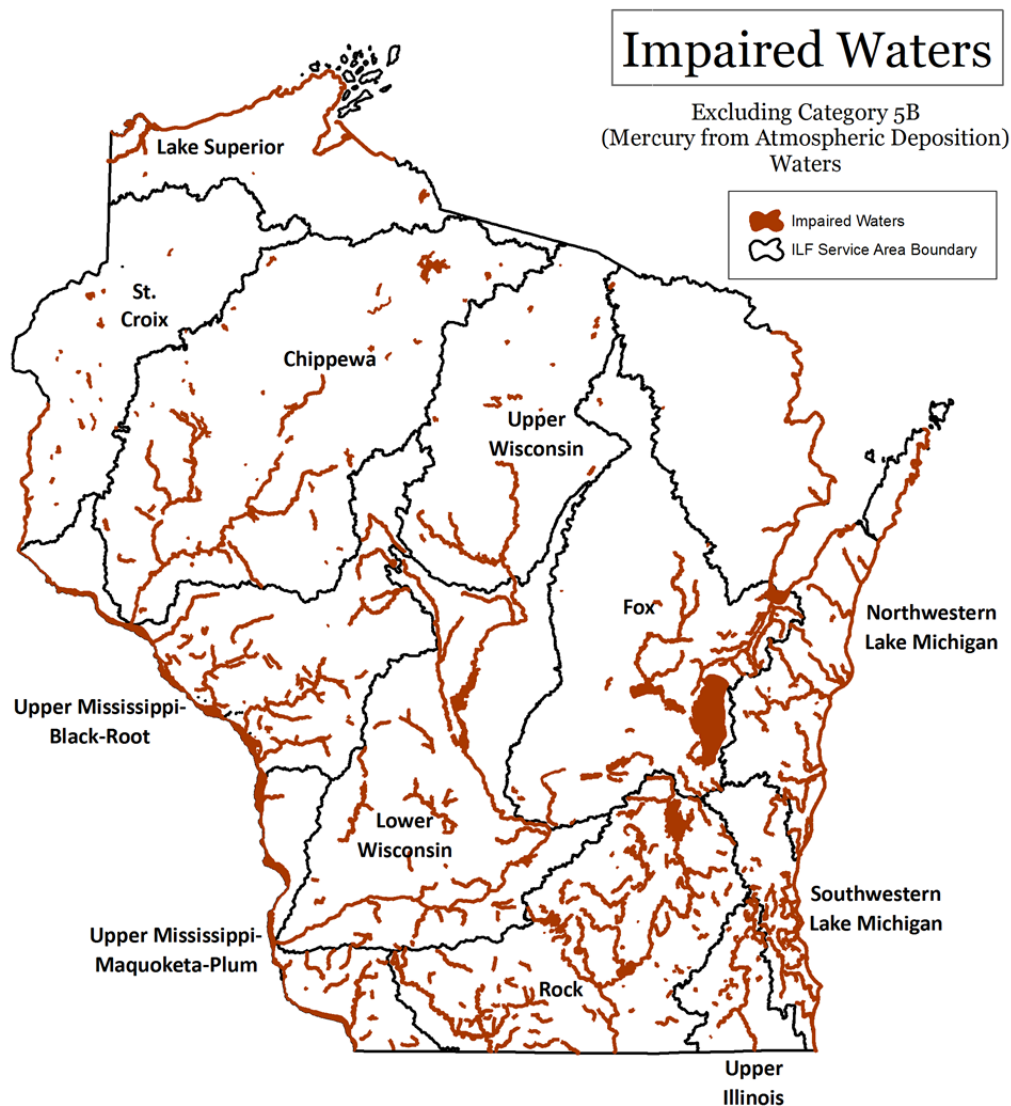
riparian wetland resources, transportation routes for cars and boats has provided conduits for the further spread of invasive species. Wetland invasive species such as Reed Canary Grass (*Phalaris arundinacea*) were analyzed in 2008 for their presence in wetlands and were found to be dominant in 10% of all wetland types comprising 498,250 acres (**Hatch and Bernthal Oct 2008**) across Wisconsin (**Figure 7.**). Invasives can displace native species, degrade suitable habitat, impact life cycle development and disrupt the food chain in those areas where it becomes dominant. The WWCT will strive to select sites where invasives have not taken over or areas that provide an opportunity for control. WWCT projects will address invasives control through site specific performance standards to maintain high percentages of native species resulting in healthy sustainable projects. Also the WWCT preservation mechanism may be a tool to protect high quality sensitive wetland resources from the onslaught potential these intrusive species present.

**Figure 7. Percent Area of Wetlands Dominated by Reed Canary Grass, per Watershed.**



**Nutrient and Sediment Loading** – Point and nonpoint runoff has directed both sediment and excess nutrients into wetland resources resulting in changes in hydrology, disruption to vegetative communities, adverse impacts to habitat and opened the door to invasive species. Commonly referred to as nature’s filtration devices, wetlands can serve to remediate many issues related to nutrient and sediment loading, but excessive runoff can damage this function. Impairment in this area can have downstream negative impacts to aquatic resources leading to eutrophication resulting in algae blooms, fish kills, reduction of floristic quality and other unfavorable effects. The WWCT will target wetlands that have historically served as these filtration devices, but have been impacted and restore their ability to provide this valuable function paying particular attention to those wetlands found in service areas having high quantities of 303d listed Impaired Waters (**Figure 8.**). WWCT projects that target Potentially Restorable Wetland areas will eliminate the annual nutrient loading and non-point runoff in agricultural settings through perennial re-vegetation, thus restoring their water quality function and reducing inputs.

**Figure 8.** Depicts 303d listed Impaired Waters shown in orange in each Service area.



### Element III. Historic Loss

Wisconsin has lost 46% of their estimated original ten million wetlands acres present in the 1780's leaving approximately 5.3 million acres today (*Dahl, 1990*). Historically viewed as wastelands these wetland resources were destroyed drained or filled for agriculture, roads, cities, development and other uses during a time in which rural and urban development was underway. Those wetland areas that contained organic soils were targeted for agricultural development as the most fertile lands in the state being stripped of their wetland hydrology and native vegetative communities transformed into row crops and pasture land. Dams were constructed on waterways and associated riparian wetland for grain mills as farming practices grew. Wetlands landscape position generally being found in the lower contours where surrounding drainage could congregate were viewed as wastelands best served by filling and/or draining for residential, commercial, industrial and agricultural development activity as settlement occurred throughout Wisconsin. Pre-settlement vegetation cover in Wisconsin, which is the data digitized from a 1976 map created from land survey notes written in the mid-1800s when Wisconsin was first surveyed depict a landscape historically dominated by ~82% forest cover (*Figure 9.*). Current land use extrapolated from USGS NLCD 2006 land cover data reveals that human influence has impacted approximately ~44% of the original land cover and converted it into cultivated crops, hay, pasture land, and various developed areas that have changed our landscape (*Figure 10.*). The timber industry, logging, pulp and paper mills were very active historically given the density of Wisconsin's forest cover. The timber industry opened the door for subsequent settlement in many areas leading to land clearing for agriculture, housing and trails that eventually morphed into roadways. Urban sprawl has extended these influences into more rural areas over time leading to the proliferation of changes to the physical, chemical and biological features of wetlands across the state. While historical impacts remain scattered across the state, science based data to catalogue the resulting impacts has been documented and mitigation opportunities lie in wait in some instances while others may have been transformed forever.

#### Potentially Restorable Wetlands = Overall Historic Wetland Loss:

The DNR has catalogued restoration opportunities through the creation of Potentially Restorable Wetlands (herein, "PRW") GIS mapping layer that identifies soils composed of at least 85% hydric inclusions that are no longer functioning nor mapped as wetlands (*Hatch and Bernthal Aug 2008*). However, there are several counties that do not have digital data available at the time this Instrument was prepared including: Vilas, Florence, Forest, Dunn, Jackson, Eau Claire and La Crosse. Therefore, since preparation of the PRW information requires digital wetland maps data, these counties were not included in the analysis and tables detailed under each SA in **Appendix A**. Once this data becomes available the Sponsor shall update the information accordingly. The PRW's were further broken down into three main categories based on their mapped polygons, which are depicted below:

- **PRW's Less than 0.5 acres** in size representing very small areas not typically suited for wetland restoration due to their small size and associated limited potential impacts to wetland function and overall watershed health;

- **Unrecoverable PRW** areas due to overlaying structures, concrete, roadways and other land uses that are incompatible with restoration opportunities;
- **Potentially Restorable Wetland Opportunity** areas representing those that are not disqualified based on the two descriptors above and are capable of restoration activities with potential wetland functional improvement resulting in an overall benefit to watershed health.

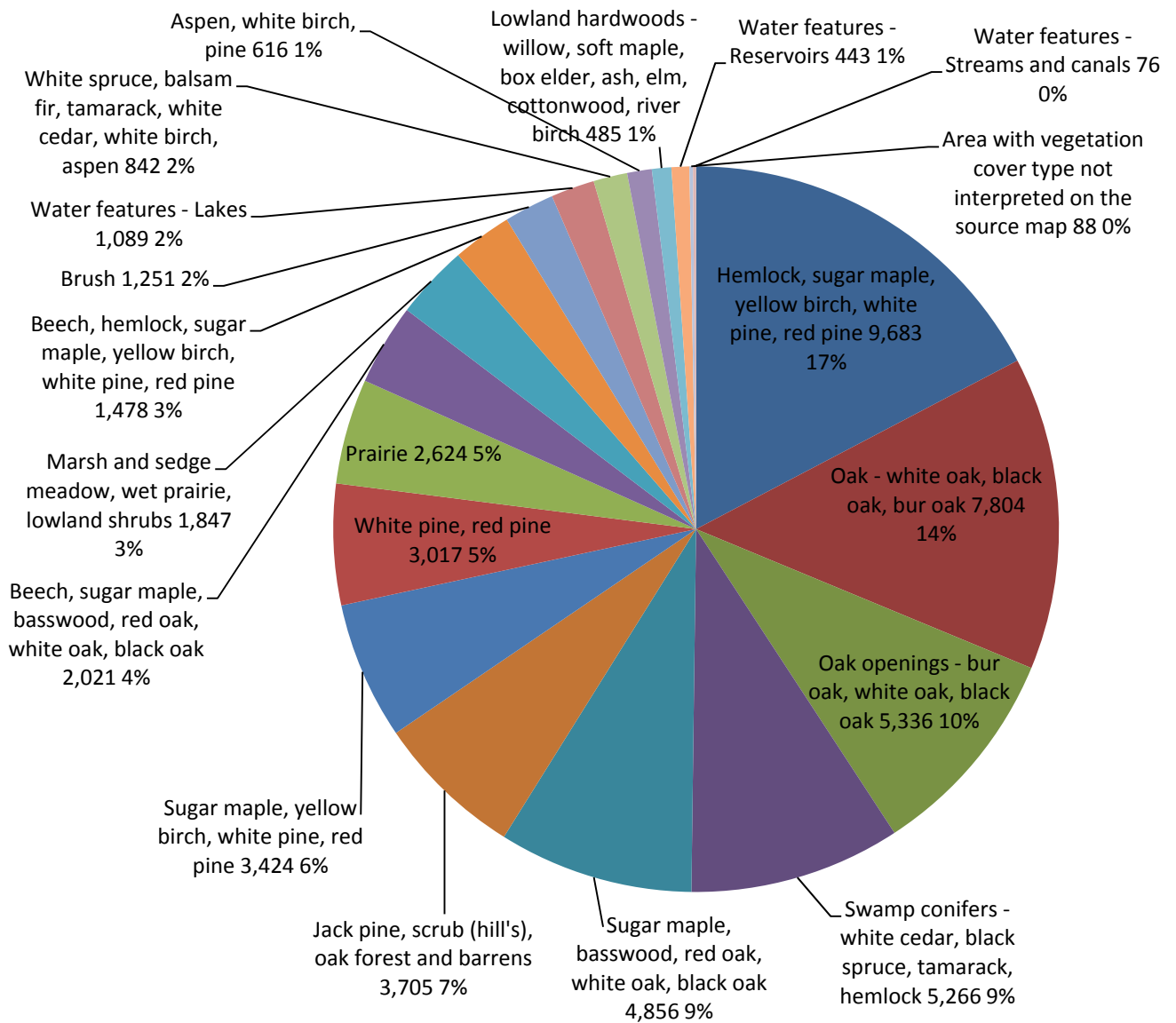
This PRW GIS layer's background data is further broken down on a HUC-8 basis specific to each SA under the CPF's found in **Appendix A** to show overall estimated total historic wetland loss percentages in accordance with the following:

- **Overall Estimated Historic Wetlands Loss Percentage** - All three categories of potentially restorable wetlands above were combined to compose the total PRW and were then combined with the currently available Wisconsin Wetland Inventory (herein, "WWI") mapping data to depict the extent of total historic wetlands in each SA. These estimated total historic wetlands were then compared against the extent of current WWI mapping to depict the best available data showing the estimated extent of historic wetland loss for each HUC-8 with the SA.

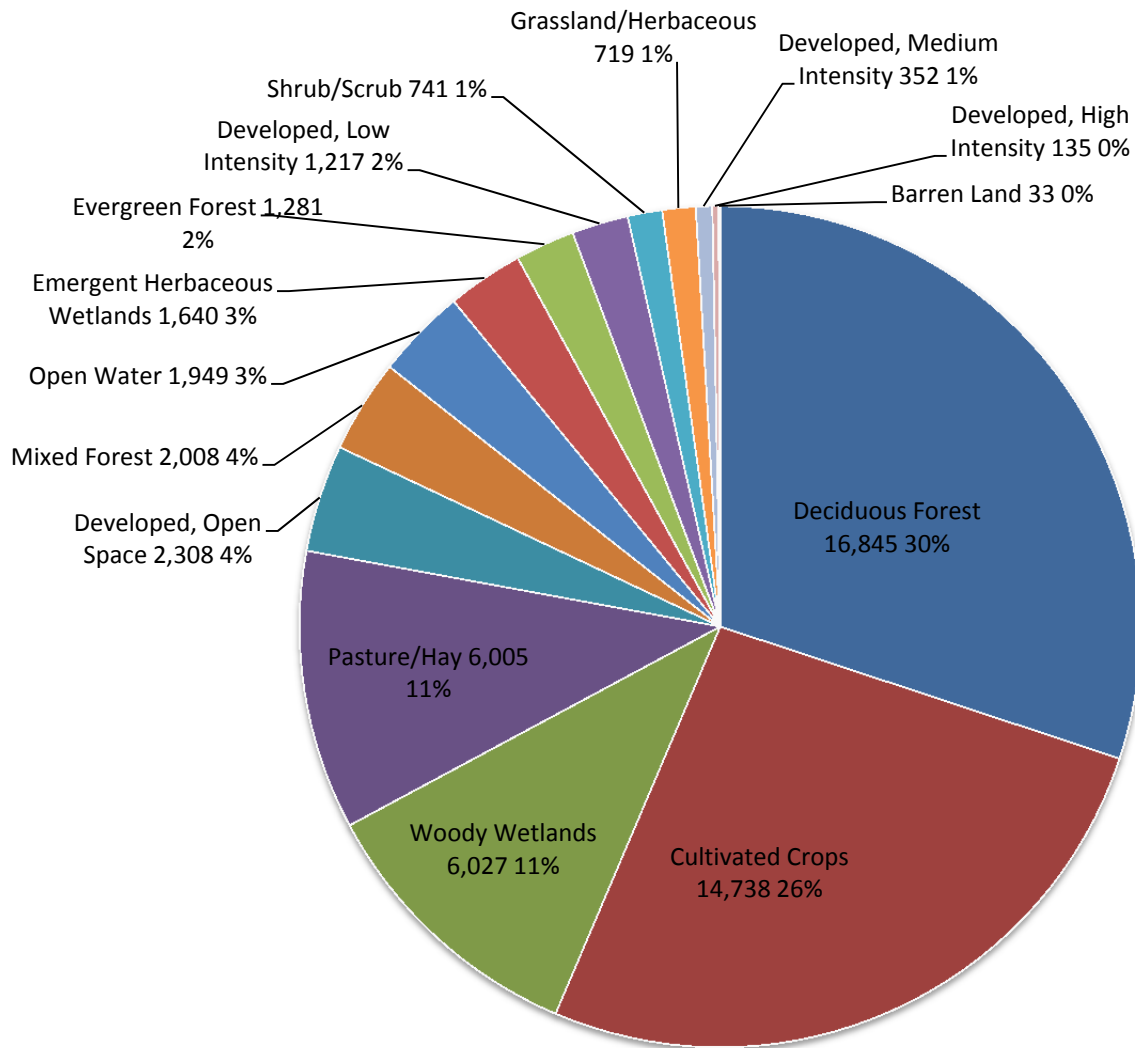
#### **Historic Wetland Type Loss:**

In order to provide the type of wetlands lost several GIS layers were employed to depict the best available data for estimating the percentage loss categorized according to the wetland types reference in the 2013 WI Mitigation Guidelines. The same approach discussed above was utilized to provide the overall historic extent of wetlands (WWI + PRW), which was then utilized as the selecting layer for wetland extent. In order to establish the pre-settlement vegetation, the Original Vegetation Cover of WI (**Finley 76**) (herein, "OVC") GIS layer was used as the base layer. The resulting intersection between the historic wetland and OVC showed the estimated vegetative composition of Wisconsin's pre-settlement wetlands. In order to further refine the resulting data was also laid over the U.S. Department of Agriculture's SSURGO (Soil Survey Geographic Database) soil orders for alfisols, histosols, mollisols and spodosols. Lastly, data was tagged as being either north, within or south of the vegetative tension zone (Curtis 71). The resulting matrix of data and associated polygons was subsequently converted into the wetland community types described in the 2013 WI Mitigation Guidelines to reflect the best available data depicting estimated historic wetland types. Once these estimated types were prepared they were analyzed to estimate the percentage loss (PRW / WWI) of each wetland type, which is reflected under each CPF and utilized as the main basis for setting the HUC-8 specific goals and objectives. Fresh (Wet) Meadows were not synthesized using this method since they are not considered to be a pre-settlement community, but rather a disturbed wetland condition present in current mapping conventions. Likewise, since ~82% of pre-settlement Wisconsin was covered in forest (**Figure 9**) the vast majority of historic wetlands can be described as either Wooded Swamps or Floodplain Forests.

**Figure 9. – WI Original Vegetative Cover, depicted in square miles & % of total cover.**  
*(depicts the pre-settlement vegetation of WI as ~82% forested)*



**Figure 10. - WI Current Land Cover (USGS NLCD 2006), depicted in square miles & % of total cover.**  
*(depicts the conversion of land use into only ~47% remaining forested)*



#### Element IV. Current Conditions

The current wetland conditions are detailed in terms of overall category type grouped according to the 2013 WI Mitigation Guidelines depicted for acre quantity and relative frequency specific to each HUC-8 watershed respective to the SA contained in **Appendix A**. The information was gathered from the Wisconsin Wetland Inventory (herein, "WWI"), which provides digital representations of the type, size and location of wetlands in Wisconsin. These maps were prepared by analyzing high altitude imagery, soils surveys, topographic maps, earlier wetland inventories and field work. There are several counties that do not have digital data available at the time this Instrument was prepared including: Vilas, Florence, Forest, Dunn, Jackson and La Crosse. Therefore, wetland data for these counties was not included in the analysis, tables and scope of the conditions detailed under each SA in **Appendix A**. Once this data is complete and becomes available the Sponsor shall update the information accordingly.

## Element V. Goal and Objectives

The overall intent of the CPF's are to provide clear direction to the Sponsor for wetland compensatory mitigation site selection, planning, design and implementation.

**The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.**

Specific wetland resource goals and objectives based on overall historic wetland loss, permit impact trends and threats for each SA along with resource objectives for each HUC-8 watershed are listed under the CPF's contained within **Appendix A**.

Service Area goals and objectives define the broader elements to be achieved within the overall service area, such as replacing lost historic wetland types in mapped PRW areas, replacing wetland functions in locations that have sustained high historic losses and contain ample PRW quantity as well as removing 303d listed impaired waters whose contributing pollutant can be addressed through compensatory mitigation projects. Specific wetland acre quantity objectives are based on the annual average of the past 5 years of Federal (Corps) permit impact trends along with an approximate 2 year timeframe for accumulating sales of Advanced Credits before having to then initiate WWCT RFP and/or internal processes and subsequent project construction as a baseline for programmatic evaluation.

HUC-8 Watershed Goals and Objectives define more focused elements to be achieved such as the type of wetlands to be restored and enhanced based largely on the wetland types that have sustained the greatest estimated percentage of loss supported by significant estimated acreage losses. HUC-8 Watershed Goals and Objectives have also utilized the WI Wildlife Action Plan ecological landscape conservation opportunity maps that depict where opportunity for management of rare wetlands exists in order to list the types of rare wetlands that should be preserved and enhanced .

## Element VI. Prioritization Strategy for Site Selection and Planning

The strategy for prioritizing the selection and siting of compensatory mitigation projects begins by first comparing all projects of consideration against the below list of Core Requirements that detail the general prerequisites and initial evaluation criteria common to all service areas. After projects are evaluated against these Core Requirements they will then be further prioritized and selected based on the specific strategy listed under each CPF described in **Appendix A**. The Sponsor shall either prepare a viable Mitigation Plan on its own or review proposals submitted through an open RFP solicitation to determine the projects ability to satisfy the requirements listed below and ultimately select a proposal in accordance with the Prioritization Strategy. The Sponsor shall refer to this portion of the CPF as well as **Appendix A** during the prioritization, selection and siting of projects. The Sponsor retains the sole right to make the final determination on which proposal to bring forth as a Mitigation Plan prepared in accordance with 33 CFR 332.4(c)(1)(iii) to the Corps and IRT for funding approval. However, the Sponsor

shall provide a list accompanying projects submitted for Corps and IRT approval that reflects the mitigation sites received through the corresponding RFP process that were not selected by the Sponsor.

**Core Requirements:**

- All mitigation site proposals must contain the ability to result in a successful and sustainable net gain and/or preservation of wetland function and/or wetland area.
- All mitigation site proposals must fulfil the tenets of existing Advanced Watershed Plans (where applicable) and/or fulfil the tenets of the prioritization strategy for the corresponding SA with preference being given to AWP's. Existing AWP's are defined as those plans that were reviewed and approved by the Sponsor and Corps and are listed in the CPF specific to each SA.
- Other Evaluation Criteria may include, but are not limited to :
  - Cost, feasibility, size, proximity to other conservation lands or protected areas, connectivity or location in respect to corridors, human use value, efficient long-term maintenance, location within approved WI Natural Resource Board Boundaries.

## **Element VII. Preservation**

Contained within the Code of Federal Regulations (33 CFR 332.3(h)), preservation may be utilized by the Sponsor as a method to provide compensatory mitigation to protect resources and generate Released Credits provided the site meets the following criteria:

- The resource provides important physical, chemical or biological functions that significantly contribute to the ecological sustainability of the watershed;
- The resource must be under the threat of destruction or adverse modification;
- The preserved site must be perpetually protected through an appropriate real estate or other legal instrument.

The WWCT will utilize preservation in watershed areas containing low PRW's or when it has been identified as candidate site of an advanced watershed plan or listed as a conservation opportunity within other large scale plans prepared in conjunction with stakeholder input such as the WI Wildlife Action Plan. Where appropriate and practicable the preservation shall be done in conjunction with resource restoration, establishment and/or enhancement activities even if completed in subsequent years following protection establishment. The targeted areas for use of preservation shall include high quality wetlands, difficult wetlands to restore and/or establish (i.e. calcareous fens), critical wetland habitat for threatened and endangered species along with Species of Greatest Conservation Need and other resources identified as important to meet Wisconsin's conservation and watershed needs. These areas may be identified in conservation plans developed by regulatory agencies, advanced watershed plans or other overarching conservation plans such as the ***WI Land Legacy Report, WI Wildlife Action Plan, WI State Natural Areas Program, WI Natural Heritage Inventory*** or other scientific based methodology and peer information compiled in consultation with stakeholders.

In the event a preservation site is selected by the Sponsor a mitigation plan shall be submitted to the Corps and IRT for approval. However, these plans may contain different elements than those reflected in **Appendix E**, for example, there may be no construction or annual monitoring unless specifically identified. These less complex proposals shall be subject to the credit generation and release schedules identified under the Released Credit Fulfillment Schedule section and may qualify for the streamlined review process identified under 33 CFR 332.8(g), at the discretion and approval of the Corps.

### **Element VIII. Stakeholder involvement**

The WWCT Sponsor has a commitment to engage stakeholders starting with the overall development of the program through the final planning and implementation. Large scale planning and guidance documents such as *The 2013 Guidelines for Wetland Compensatory Mitigation in Wisconsin, WI Wildlife Action Plan, WI Land Legacy Report and Reversing the Loss* were chosen as reference in creating the WWCT in part due to their heavy stakeholder involvement and exposure to the public arena to build upon the widely vetted nature of the program. The Sponsor has also worked closely with the Corps and IRT comprised of key stakeholders from Federal agencies to develop the components of the program. The Sponsor has also engaged separate stakeholders from non-profits and non-governmental entities to gather valuable input relevant to the overall functionality of the WWCT. The WWCT will continue to collaborate with additional conservation entities and individuals to evaluate wetland compensatory mitigation site opportunities as well as develop mitigation plans, implementation, monitoring and long term management responsibilities. The Sponsor will prepare announcements for distribution and website postings to keep the general public apprised of the WWCT development progress as well as direction over future years.

The Sponsor shall seek opportunities to work with stakeholders through the creation of advanced watershed plans (herein, "AWP") where more localized input is especially valuable in seeking the most beneficial wetland compensatory mitigation projects that promote overall wetland function and watershed health. All existing and subsequent AWP's will be submitted to the Corps to ensure that the tenets of each AWP is commensurate with the requirements of providing compensatory mitigation under the in-lieu fee program framework and in accordance with the federal mitigation rule. Subsequently, accepted AWP's will be incorporated into the comprehensive planning framework of each respective service area by a modification to the instrument.

The Sponsor will also engage stakeholders through the RFP solicitation process to seek qualifying wetland compensatory mitigation proposals that meet the goals and objectives of the CPF. Both internal and external parties will have the opportunity to propose sites and projects that will improve wetland functions and improve local watershed health benefitting the public.

Beyond utilizing the Sponsor's experience and outside stakeholders; other DNR Programs may participate in contributing resource knowledge to continually shape the WWCT goals and objectives. The WWCT will strive to foster long lasting relationships and partnerships with non-profits, non-

governmental entities, federal and state agencies, local units of government, private firms and the general public that share common wetland resource goals and objectives. Promoting such relationships will benefit the overall WWCT to diversify contributing information resulting in broad set of guiding principles similar to the comprehensive watershed approach to determine those ideas that collectively rise as common elements.

The WWCT will also interface with regulatory agencies to determine whether permits are required for the implementation of compensatory mitigation projects. Following approval of proposals by the Corps the Sponsor or its assigns will engage the appropriate regulators to determine which permits may be required along with the requirements for approval. This process will provide another opportunity to involve stakeholders for a given project and further build meaningful professional relationships.

### **Element IX. Protection**

The Sponsor is responsible for developing and ensuring long term protection and management specific to each approved compensatory mitigation project site. All WWCT sites shall be perpetually protected through real estate instruments or other legal mechanisms so as to preserve their intended function, use and condition over time. Where feasible and appropriate fee-simple title will be employed while in other scenarios conservation easements, such as the DNR Wetland Compensatory Mitigation Easement (included as **Appendix G**), restrictive covenants or other legal mechanisms will be applied in accordance with 33 CFR 332.7(a). The perpetual protection mechanism approved by the Corps as part of an individual Mitigation Plan shall be notarized and recorded with the county Register of Deeds so as to ensure it remains with the title to the property. The required site specific Mitigation Plans as reflected in **Appendix E** or terms of perpetual protection will describe the permitted/prohibited uses for each site so as to maintain the resource functional intent as well as any provisions of the preservation mechanism.

The Sponsor will address the responsibility of long-term management by ensuring that sites are properly managed by either conducting the required actions on its own or by transferring responsibility as detailed under the Ownership Arrangement & Long-Term Management section of this Instrument. The Sponsor will aim to select, design and construct projects that require minimal long-term human manipulation once performance standards have been met. However, the Sponsor recognizes that plans should also anticipate situations where this is not feasible. Within each site specific monitoring and long term management strategy the Sponsor will include estimates for such activities and identify funding devices such as non-wasting endowments, trusts, escrows, contractual agreements or other appropriate financial tools as part of the required Management Plan to be approved by the Corps. The Sponsor will also set aside program revenue for a collective program contingency fund to be used when warranted to correct, repair or address catastrophic or unforeseen events that negatively impact a project site's ability to provide the intended wetland function.

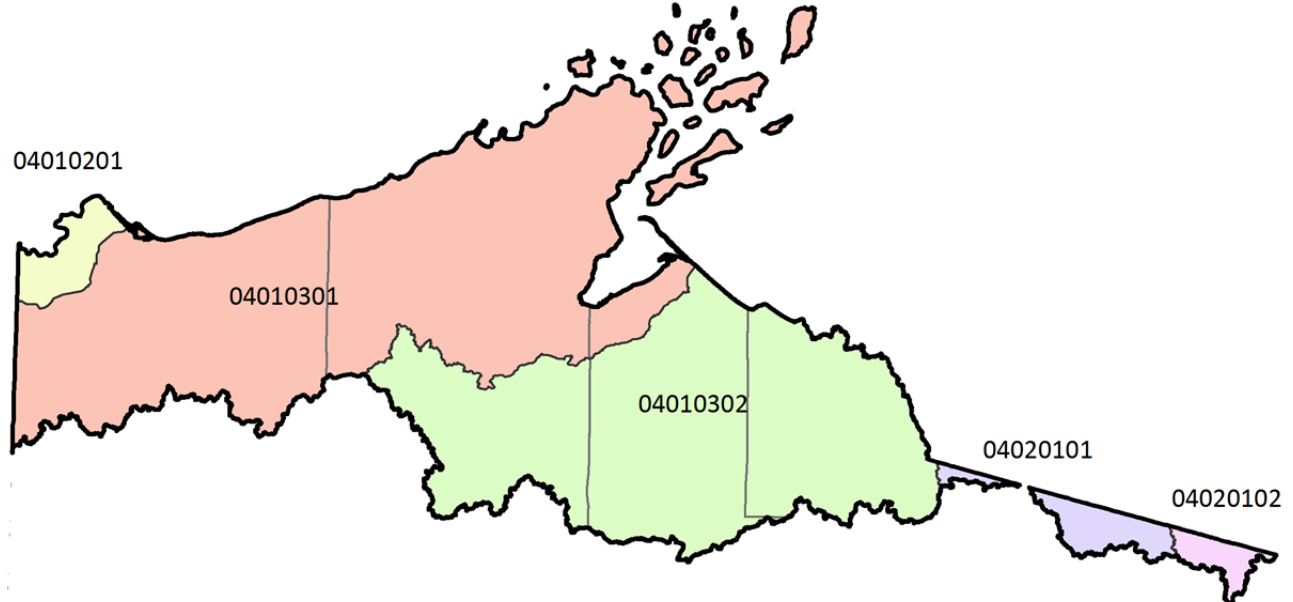
**Element X. Evaluation and Reporting**

The WWCT expects that much like the ever changing adverse forces that alter the wetland landscapes of Wisconsin, the WWCT will also need to be dynamic in nature to overcome the challenges that lie ahead. Therefore, the Sponsor will conduct an initial program review after two full years of implementation with subsequent program reviews occurring every 5 years thereafter, unless otherwise required by the Corps. During these evaluation periods the Sponsor will undertake an assessment of the entire programmatic framework to determine if any modifications are warranted, which if deemed necessary will be presented to the Corps for approval. Part of this evaluation will review the goals and objectives along with the prioritization strategy set forth under each of the CPF to determine relevancy and success within the context of changing land use, development trends and wetland resource threats on a HUC-8 watershed basis. An in depth assessment of the quantity of wetland compensatory credits sold vs. successfully released credits will be undertaken to ensure proper mitigation is occurring for unavoidable permitted actions. Mitigation Plans shall be evaluated based on their potential to provide compensatory mitigation for impacts associated with approved permits and ability to meet the goals and objectives of the CPF in which it is proposed. Mitigation sites will be assessed based on their ability to meet or exceed the performance standards established and approved in their mitigation site plan. These assessments will be reflected in the annual monitoring reports for each site until released from the initial monitoring period and thereafter reflected in the long-term management and maintenance report included as a component of the periodic WWCT program review (first 2 years, then every 5 years thereafter). These evaluations will be done outside of the context of the annual reporting discussed under the Financial & Credit Reporting section as the need arises or if a substantial change in information becomes available. These evaluation periods will enable the Sponsor ample time and flexibility to establish its own experiences with the current programmatic framework and adapt as necessary.

## Lake Superior CPF

### Element I. Service area:

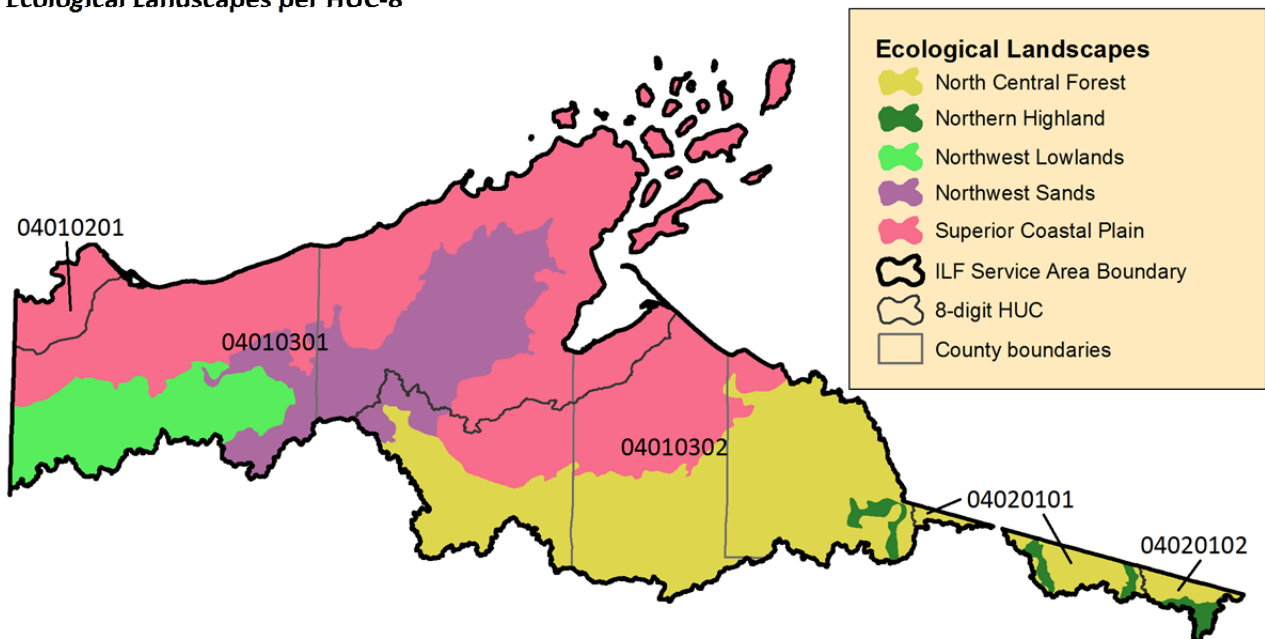
**Overall SA with separate HUC-8 watersheds designated in color**  
(county & state boundaries shown in straight lines for further reference)



The Lake Superior Service area is located at the northern tip of Wisconsin comprised of Douglas, Bayfield, Ashland, Iron and Vilas counties and drains an area approximately 2,984 square miles.

Ecological Landscapes include (WDNR 2012):

### Ecological Landscapes per HUC-8



**North Central Forest** - Typical of northern Wisconsin, mean growing season in the North Central Forest is 115 days, the shortest growing season of all Ecological Landscapes in the state. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean annual snowfall is 63 inches. However, heavier snowfall can occur closer to Lake Superior, especially in the northwestern part of the Ecological Landscape in the topographically higher Penokee-Gogebic Iron Range. The cool temperatures and short growing season are not conducive to supporting agricultural row crops such as corn in most parts of the Ecological Landscape. Only six percent of the North Central Forest is in agricultural use. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penokee-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands. Rivers, streams, and springs are common and found throughout this Ecological Landscape. Major rivers include the Wisconsin, Chippewa, Flambeau, Jump, Wolf, Pine, Popple, and Peshtigo. Large lakes include Namekagon, Courte Oreilles, Owen, Round, Butternut, North Twin, Metonga, Pelican, Pine, Kentuck, Pickerel, and Lucerne. Several large man-made flowages occur here such as the Chippewa, Turtle-Flambeau, Gile, Pine, and Mondeaux. There are several localized but significant concentrations of glacial kettle lakes associated with end and recessional moraines (e.g., the Perkinstown, Bloomer, Winegar, Birchwood Lakes, and Valhalla/Marenisco Moraines.) In southern Ashland and Bayfield counties, the concentrations of lakes are associated with till plains or outwash over till. Lakes here are due to dense till holding up the water table. Rare lake types in the North Central Forest include marl and meromictic lakes. Forests cover approximately 75% of this Ecological Landscape. The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack), non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marsh (including wild rice marshes) are widespread in the North Central Forest. Population is estimated at 244,782, comprising 4.4% of the state total resulting in a population density of approximately 19 persons/ sq. mile. Forty-two percent is publicly owned, mostly by federal, state or county governments.

**Northern Highland** - Typical of northern Wisconsin, with a mean growing season of 122 days. The mean annual temperature is 39.5 deg. F, the lowest of any Ecological Landscape in the state and almost 2 degrees lower than other northern ecological landscapes. The mean annual precipitation is 31.6 inches, similar to other northern ecological landscapes. The mean annual snowfall is 68.1 inches, the second largest amount of snowfall in the state. Only the Superior Coastal Plain receives more snowfall (87.4 inches). Snowfall varies dramatically within the Northern Highland, with the northern part of the

Ecological Landscape being within the outer edge of the lake effect "snowbelt" of Upper Michigan and northwestern Wisconsin. The cool temperatures, short growing season, and sandy soils are not adequate to support agricultural row crops, such as corn. Only about one percent of the Northern Highland is used for agricultural purposes. The climate is favorable for forests, which cover more than 76% of the Ecological Landscape. Most of the Ecological Landscape is an undulating, gently rolling glacial outwash plain with many kettle lakes, wetlands, and bogs. Remnant moraines and drumlins occur often, with their lower slopes covered with outwash sands. Most soils are sands and gravels, some with a loamy mantle. Soil productivity is low compared to glacial till but relatively high for outwash sands. Wetlands are numerous; most have organic soils of peat or muck. There is a globally significant concentration of glacial lakes in the Northern Highland: 4,291 lakes; 1,543 miles of streams, including the headwaters of the Wisconsin and Manitowish-Flambeau-Chippewa river systems. Many lakes are connected by small streams. Rare aquatic species and extensive wetlands (see below) occur here. 48% upland forest, 34% wetlands (both forested and non-forested), 13% open water, 5% grassland and open land, and 1% urban. Population is estimated at 65,660, comprising 1.2% of the state total resulting in a population density of approximately 23 persons/ sq. mile. Thirty percent of the land area and forty-three percent of the forestland in the Ecological Landscape is in public ownership.

**Northwest Lowlands** - – Typical of northern Wisconsin; the mean growing season is 122 days, mean annual temperature is 41.8 deg. F, mean annual precipitation is 30.6, and mean annual snowfall is 49 inches. The cool temperatures and short growing season are not adequate to support agricultural row crops; less than three percent of the land here is used for agricultural purposes and most of this is in the southern "hook" in Burnett County. The climate is favorable for forests, which cover almost 70% of the Ecological Landscape. The cool temperatures and short growing season, along with numerous and large acid peatlands, result in almost boreal-like conditions in parts of the Northwest Lowlands. The major landforms are ground and end moraines, with drumlins present in the southwestern portion. Topography is gently undulating. In the northern part of the Ecological Landscape many stream valleys run northeast-southwest in roughly parallel courses. This is caused by bedrock ridges that were created by harder strata of lava alternating with weaker sedimentary rocks; these were later tilted upward due to rifting and continental collision. This bedrock feature influences the surface topography of the Northwest Lowlands, especially where glacial deposits are thin. Soils are predominantly loams, with significant acreages of peat deposits in the poorly drained lowlands. Major river valleys have soils formed in sandy to loamy-skeletal alluvium or in non-acid muck. Alluvial soils range from well drained to very poorly drained, and have areas subject to periodic flooding. This Ecological Landscape occupies a major drainage divide, and contains the headwaters of many streams that flow north toward Lake Superior or south toward the St. Croix River system. Important rivers include the St. Croix, Black, Tamarack, Spruce, and Amnicon. Lakes are uncommon except in the heavily agricultural southernmost part of the Ecological Landscape in Burnett County. Impoundments, all fairly small, have been created by constructing dams on the Tamarack and Black rivers, and several creeks. The St. Croix River is fed by springs, spring ponds, and seepages. The present-day forests remain extensive and relatively unbroken, occupying about 68% of the landscape. Forests consist mainly of aspen, paper birch, sugar maple, basswood, spruce and fir. Minor amounts of white pine, red pine and red oak are also present. Older successional stages are currently rare, as almost all of this land is managed as "working forests". The

large undisturbed peatland complexes consist of mosaics of black spruce-tamarack swamp, muskeg, open bog, poor fen, shrub swamp, and occasionally, white cedar swamp. The St. Croix River corridor includes forested bluffs and terraces, which support communities unlike those found in most other parts of the Ecological Landscape. These include mesic maple-basswood forest, dry-mesic forests of oak or oak mixed with pine, black ash-dominated hardwood swamps, and numerous forested seeps. Less extensive areas of marsh and sedge meadow also occur along the St. Croix. In most of this Ecological Landscape minor amounts of land are devoted to agricultural and residential uses, and most of these land uses are concentrated along State Highway 35. The major exception to this pattern is the area that wraps around the south end of the Northwest Sands which is a mix of agricultural lands and scattered oak or oak-pine woodlots. Population is estimated at 43,721, comprising 0.8% of the state total resulting in a population density of approximately 32 persons/ sq. mile. The most significant Federal ownership is the St. Croix National Scenic Riverway, administered by the National Park Service.

**Northwest Sands** - Mean annual temperature (41.30 F) is similar to other northern Ecological Landscapes. Annual precipitation averages 31.4 inches and annual snowfall about 61 inches, also similar to other northern Ecological Landscapes. The growing season is short and averages 121 days. Although there is adequate rainfall to support agricultural row crops such as corn, the sandy soil and short growing season limit row crop agriculture, especially in the northern part of the Ecological Landscape. This Ecological Landscape is the most extensive and continuous xeric glacial outwash system in northern Wisconsin. It has two major geomorphic components. One is a large outwash plain pitted with depressions, or "kettle lakes." The other component is a former spillway of Glacial Lake Duluth (which preceded Lake Superior) and its associated terraces. The spillway is now a river valley occupied by the St. Croix and Bois Brule Rivers. The hills in the northeast are formed primarily of sand, deposited as ice-contact fans at the outlet of subglacial tunnels. Lacustrine deposits (especially fine materials of low permeability such as clays) from Glacial Lake Grantsburg underlie Crex Meadows and Fish Lake Wildlife Areas, and are responsible for impeding drainage, leading to the formation of the large wetlands there. Upland soils are typically sands or loamy sands over deeper-lying strata of sand, or sand mixed with gravel. These soils drain rapidly, leading to xeric, droughty conditions within the Ecological Landscape. Wetlands in low-lying depressions have organic soils of peat or muck. This Ecological Landscape has significant concentrations of glacial kettle lakes, most of them seepage lakes, a well-developed pattern of drainage lakes, and several large wetland complexes. The lakes cover roughly 4.8% of the area of the Northwest Sands, the third highest percentage among ecological landscapes in Wisconsin. The headwaters of the St. Croix and Bois Brule rivers are here. Major rivers include the St. Croix, Namekagon, Yellow, and Totagatic. Springs and seepages are common along the Upper Bois Brule but local elsewhere. Landcover is a mix of dry forest, barrens, grassland, and agriculture, with wetlands occupying significant parts of the bed of extinct Glacial Lake Grantsburg, kettle depressions, and some river valleys. Within the forested portion, pine, aspen-birch, and oak are roughly equally dominant. The maple-basswood, spruce-fir, and bottomland hardwood forest types occupy small percentages of the Ecological Landscape's forests. The open lands include a large proportion of grassland and shrubland. Emergent/wet meadow and open water are significant in the southern part of the Northwest Sands. There is very little row-crop agriculture. Population is estimated at 90,010, comprising 1.6% of the state

total resulting in a population density of approximately 20 persons/ sq. mile. Forty-eight percent of the land and water in this landscape is in public ownership.

**Superior Coastal Plan** - – Typical of northern Wisconsin, though conditions are somewhat moderated by the proximity to Lake Superior; mean growing season of 122 days, mean annual temperature is 40.2 deg. F, mean annual precipitation is 32 inches, and mean annual snowfall is 87.4 inches. Cool summers, deep snows (including lake effect snows), high humidity, fog, mist, wave spray, currents, ice, and strong winds (e.g., along exposed coastlines, where blow-down events are frequent) affect parts of the Ecological Landscape, especially near Lake Superior. Some areas near Lake Superior support grass-based agriculture (18.5% of the Ecological Landscape). Portions of the northern Bayfield Peninsula have a climate and soils favorable for growing apples and other fruits. Areas away from Lake Superior have a shorter growing season and forests become more important than agriculture. The Bayfield Peninsula is hilly, as are some of the Apostle Islands. Both are covered by glacial tills. The level plains on either side of the Bayfield Peninsula slope gently toward Lake Superior. They are dissected by many deeply incised streams and several large rivers that generally flow from south to north toward Lake Superior. Sandspits, often enclosing lagoons and wetlands, are well-developed in the Apostle Islands archipelago and at river mouths; some of the larger spits are several miles long. Important soils include deep, poorly-drained reddish lacustrine clays on either side of the Bayfield Peninsula. The clay deposits include lenses of sand or coarse-textured till; these areas are especially erosion-prone when they are cut by streams. The tills covering the Bayfield Peninsula and Apostle Islands are variable in composition, but include clays, silts, loams and sands. Organic soils are limited in extent, occurring mostly in association with the peatlands on the margins of the coastal lagoons and to a lesser extent in basins underlain by impermeable tills. Lake Superior has had an enormous influence on the climate, landforms, soils, vegetation, and economy of the Superior Coastal Plain. Freshwater estuaries are present along the coast. Inland lakes are rare, but lagoons, some of them quite large, occur behind the coastal sandspits. Important rivers include the St. Louis, Nemadji, Bad, White, Amnicon, and Bois Brule. Coldwater streams originate in the aquifers at the northern edge of the Northwest Sands in Bayfield County and flow north across the Superior Coastal Plain before emptying into Lake Superior. Many of the streams flowing across the clay plain have suffered severe damage to their banks and beds during the era of heavy logging in the late 19th and early 20th centuries. Some of them have not yet recovered and their slumping banks continue to dump sediments into the main channels, and ultimately, into Lake Superior. Water (and soil) management can be challenging in this Ecological Landscape. Aspen-dominated boreal forests are abundant on the clay plains to the west and east of the Bayfield Peninsula. In some areas white spruce, balsam fir, and white pine (these were the dominant canopy trees prior to the Cutover) are now common understory species, or are even colonizing abandoned pastures. Older stands of boreal conifers still occur in a few places, such as the City of Superior Municipal Forest. Forest fragmentation is significant on the clay plain owing to the interspersed forests with fields and pastures. Northern hardwood and hemlock-hardwood forests occur on the Apostle Islands and include old-growth remnants. Dry forests of pine and oak are scarce in this Ecological Landscape but they do occur on some of the sandspits associated with coastal estuaries. The largest coastal wetlands cover thousands of acres, and these are composed of complex vegetation mosaics that include coniferous and deciduous forests, shrublands, wet meadows and marsh. Large wetlands in the interior of the Superior Coastal

Plain include the Bibon Swamp, a huge wetland of almost 10,000 acres along the White River on the southern edge of the Ecological Landscape, and Sultz Swamp, a peatland perched high on the northern Bayfield Peninsula. An extensive complex of wetlands of variable structure occurs on poorly drained red clays in and around the City of Superior. Population is estimated at 75,056, comprising 1.3% of the state total resulting in a population density of approximately 20 persons/ sq. mile.

This is also the only SA in our state that drains to Lake Superior providing an opportunity to protect this unique shoreline against adverse impacts such as erosion and toxic pollution. Lake Superior represents that largest expanse of fresh water in the world as well as the “cleanest” of the Great Lakes (**WDNR Basin Website 2013**). This SA is also the only one in the state that is the same for both HUC-6 and HUC-4 basins comprising the Service Area for the WWCT Program limiting its ability to seek other areas for projects or funding opportunities. This Service area can be further broken down into five smaller HUC-8 watersheds, the Beartrap-Nemadji Rivers (04010301), Bad-Montreal Rivers (04010302), St. Louis River (04010201), Black-Presque Isle Rivers (04020101) and the Ontonagon River (04020102). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

#### **Element II. Threats:**

Overall wetland resource threats within this service area include water quality from runoff events that transport highly erodible red clays and sands, impaired 303d listed waterways in the north, invasive species brought in through major commerce routes, fragmentation of corridors and land use changes. Major threat considerations in the northern portions of this service area (Superior Coastal Plain **WDNR 2012**) include climate change; impacts of water level changes on the coastal wetlands and associated biota (including attempts to stabilize the water level of Lake Superior); the continued appearance and spread of invasive species; managing water on the clay soils; and impaired waterways reflected on the 303d list. Other important issues are shoreline development along rivers and Lake Superior and protection of areas used by migratory birds and spawning fish. Management of lands in the red clay country to lessen erosion and improve water quality and habitat for aquatic life, and reduce negative edge impacts (construction, agriculture, forestry - including reforestation), are issues deserving major consideration. The central portions of this service area (Northwest Sands **WDNR 2012**) have seen increased lakeshore development, partly because of the areas close proximity to the Minneapolis-St. Paul metropolitan area. The sandy soils in these central areas are low in productivity and highly erodible and great care must be taken when planning and conducting land use activities to avoid causing damage to slopes and fragile vegetation. Many rare plants and animals occur here, especially in the barrens and sedge meadow habitats, and these need consideration when planning and conducting management activities. Increasing connectivity between resource patches and reducing habitat fragmentation and isolation, are major threats to consider for these central portions. Common reed is present in some open wetlands and may be increasing. Glossy buckthorn has been reported from the extensive cedar swamps along the upper Brule River. In the southern and western portions (North Central Forest & Northern Highland **WDNR 2012**) one of the major considerations is clarification of the roles played by and ecological relationships among public, private, industrial, and tribal lands from a conservation,

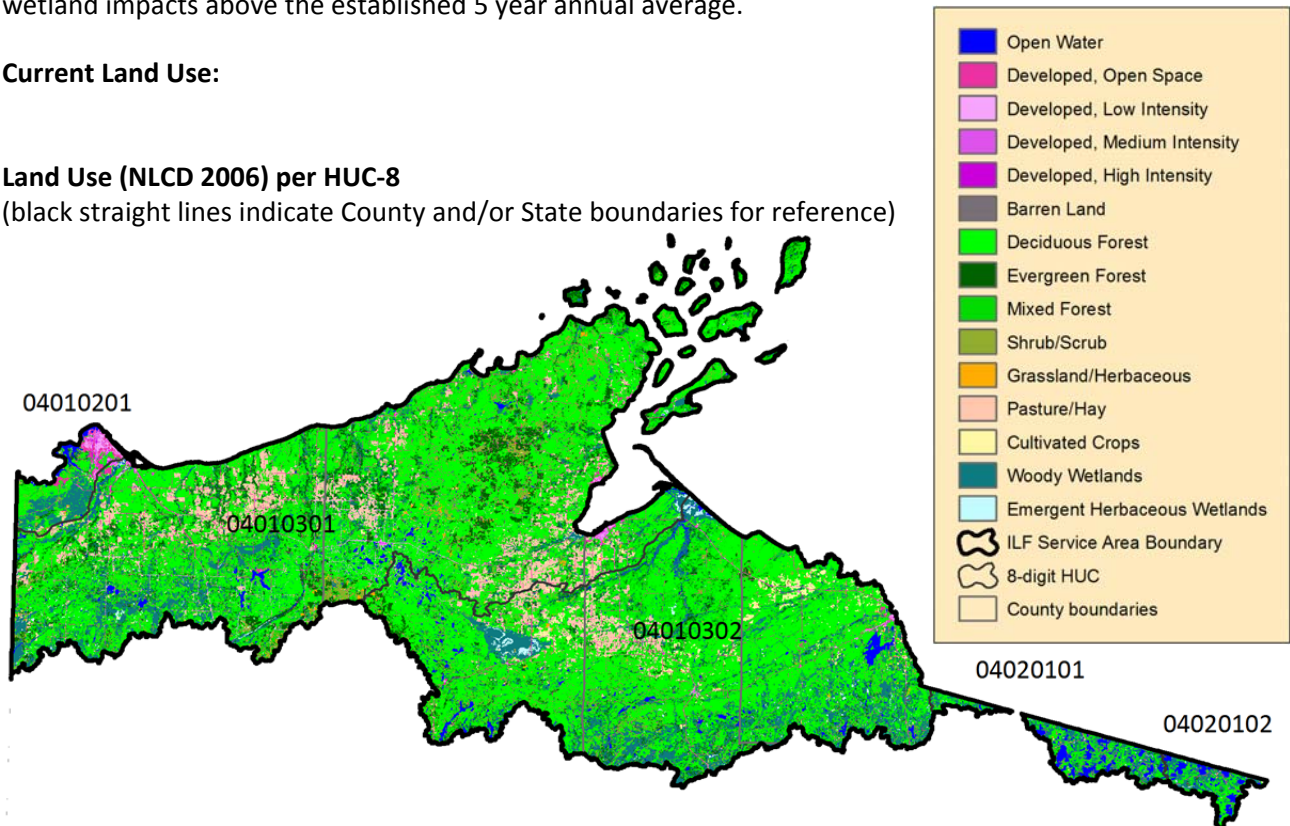
socioeconomic, and recreational perspectives. In recent years there has been documentation of widespread negative impacts to forests from: excessive deer browse; invasive earthworms, insects, plants and pathogens; divestitures of large private holdings (especially estates and industrial forests); increased parcelization; and the development of shoreline habitats. Other important threats to consider include: the potential implications of climate change; ecological impacts of increased biomass harvest; forest type conversions; forest simplification and homogenization; and fragmentation. The area of the far southeast (Northwest Lowlands **WDNR 2012**) is under threat from overall fragmentation of its extensive forests, wetlands, and potential travel and dispersal corridors threatening resource conditions.

The threats to this service area have been further analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

#### Current Land Use:

#### Land Use (NLCD 2006) per HUC-8

(black straight lines indicate County and/or State boundaries for reference)



**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
04010201 - St. Louis River	48,337	9,656	862	37,820	19.98%	1.78%	78.24%
04010301 - Beartrap-Nemadji Rivers	1,054,147	52,703	84,727	916,717	5.00%	8.04%	86.96%
04010302 - Bad-Montreal Rivers	769,432	26,793	39,725	702,914	3.48%	5.16%	91.35%
04020101 - Black-Presque Isle Rivers	48,800	2,329	70	46,401	4.77%	0.14%	95.08%
04020102 - Ontonagon River	25,532	975	50	24,507	3.82%	0.19%	95.99%

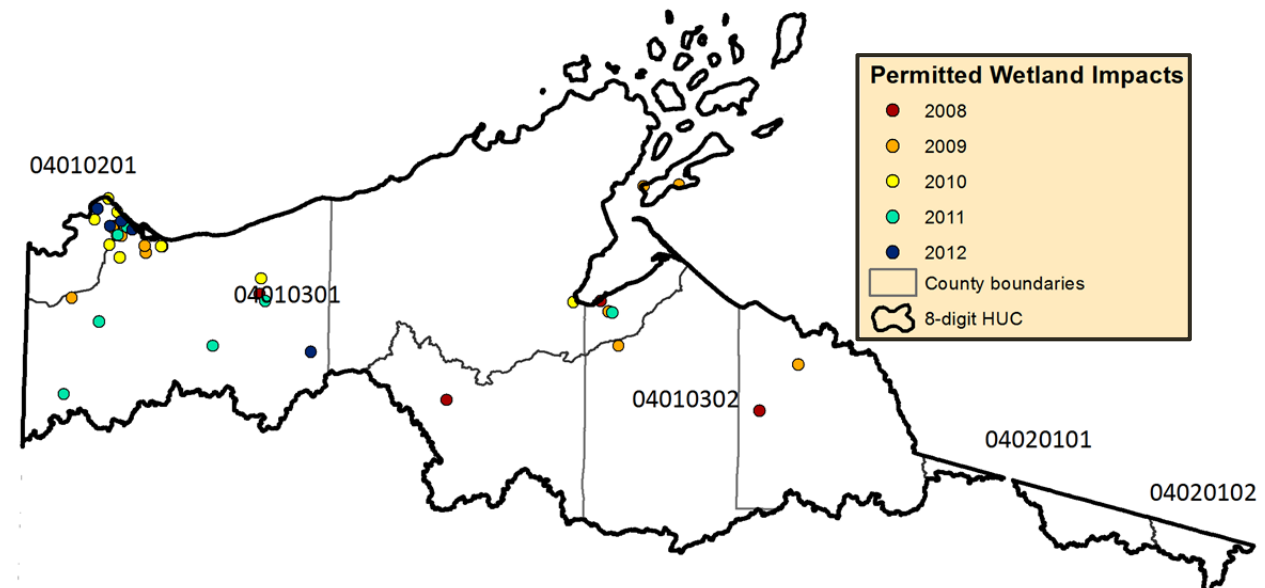
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities and ensure compatible project selection several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat and depict areas where sustainable and compatible projects may be challenging. The table, for example shows that the from the perspective of land use changes the St. Louis River HUC-04010201 is under the greatest threat from development with 19.88% of its area containing development based land uses and only 78.24% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**  
(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
04010301 - Beartrap-Nemadji Rivers	3%	0%	48%	33%	13%	3%	63,285
04010201 - St. Louis River	44%	0%	0%	0%	8%	48%	4,367
04010302 - Bad-Montreal Rivers	55%	0%	0%	35%	0%	9%	1,061
04020101 - Black-Presque Isle Rivers	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0
04020102 - Ontonagon River	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0

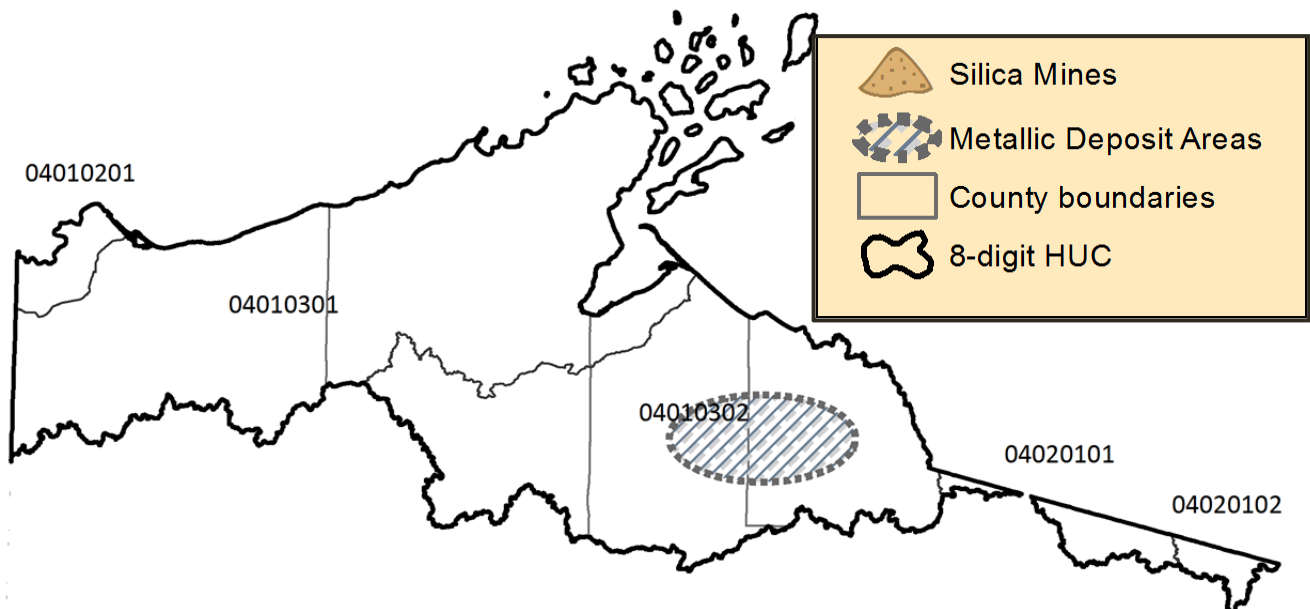
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus supporting the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

While the Lake Superior SA does not intersect with any foreseen non-metallic mining, it does contain portions of the metallic Gogebic Deposit, which generally refers to a 21-mile long segment of the Gogebic Iron Range between the community of Upson and Mineral Lake in Wisconsin. If developed this deposit would most likely result in an open pit mine creating significant wetland impacts. This deposit falls within the Bad-Montreal Rivers HUC-04010302 thus presenting an increased future threat within this watershed giving greater priority to this HUC-8 watershed.

**Potential Mining Impacts per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

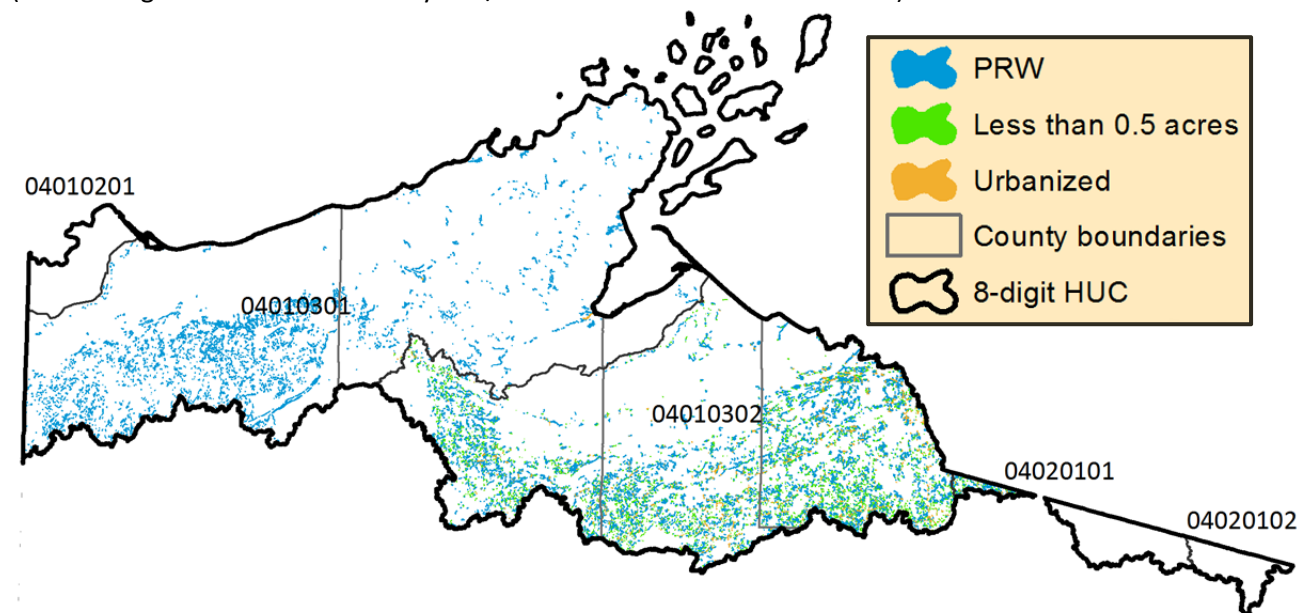


**Element III. Historic Loss:**

This Service area has been generally spared of the heavy urbanization that the other Great Lake regions have encountered. The soils are poor in comparison to other state areas, which when combined with a shortened growing season has resulted in little historical agricultural impact. The area also contains red clay soils capable of stifling infiltration rates resulting in increased runoff and sedimentation. Having a majority of land use being forested, timber harvest and the logging industry have had the greatest historical impact along with mining and transportation infrastructure stemming from its widely used ports (*WDNR Basin Website 2013*). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas and wetland types have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Overall Estimated Historic Wetland Percent Loss Summary**

(sorted from greatest to least historic loss)

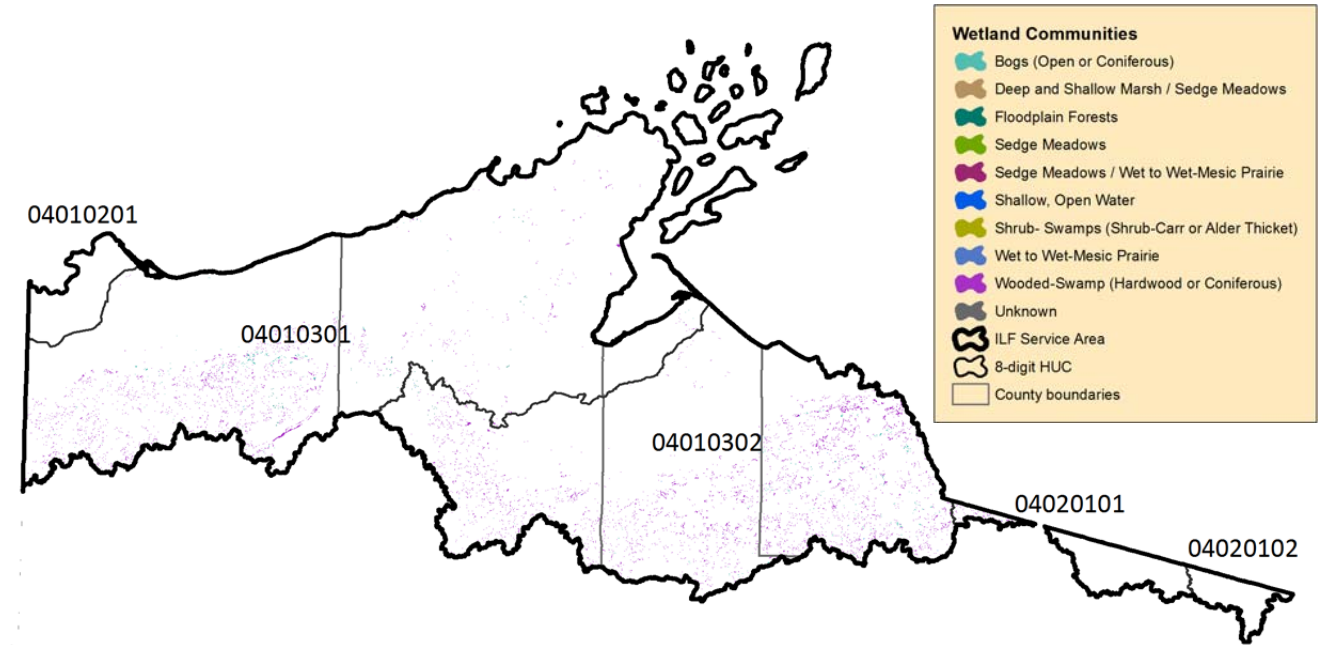
HUC	Acres of PRW Opportunity	Historic Wetland Loss % (Total PRW all / Total historic)
04020101 - Black-Presque Isle Rivers	419	19.89%
04010302 - Bad-Montreal Rivers	15,668	11.67%
04010301 - Beartrap-Nemadji Rivers	9,680	5.76%
04010201 - St. Louis River	2	0.02%
04020102 - Ontonagon Rover	NA	NA

It should be noted that currently the Black-Presque Isle Rivers HUC-04020101 and Ontonagon River HUC-04020102 do not have digitally available overlay WWI / PRW data for Vilas County, which is a major

portion of these watersheds. Similarly the St. Louis River HUC 04010201 is missing overlay WWI / PRW digital data for Douglas County diminishing the context for historic wetland loss in these areas.

#### Estimated Historic Loss of Wetland Types per HUC-8

(black straight lines indicate County and/or State boundaries for reference)



#### Estimated Percent Loss of Historic Wetland Types per HUC-8

(a #DIV/0! value means not applicable & a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or Coniferous)
04020101 - Black-Presque Isle Rivers	19.48%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	92.27%	#DIV/0!	#DIV/0!	#DIV/0!	19.31%
04010302 - Bad-Montreal Rivers	3.92%	#DIV/0!	31.33%	0.00%	#DIV/0!	6.92%	0.24%	#DIV/0!	#DIV/0!	11.24%
04010301 - Beartrap-Nemadji Rivers	3.01%	#DIV/0!	19.23%	1.44%	#DIV/0!	7.46%	0.28%	2.49%	0.00%	4.74%
04010201 - St. Louis River	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	#DIV/0!	0.53%	#DIV/0!	0.01%
04020102 - Ontonagon River	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

#### Element IV. Current Conditions:

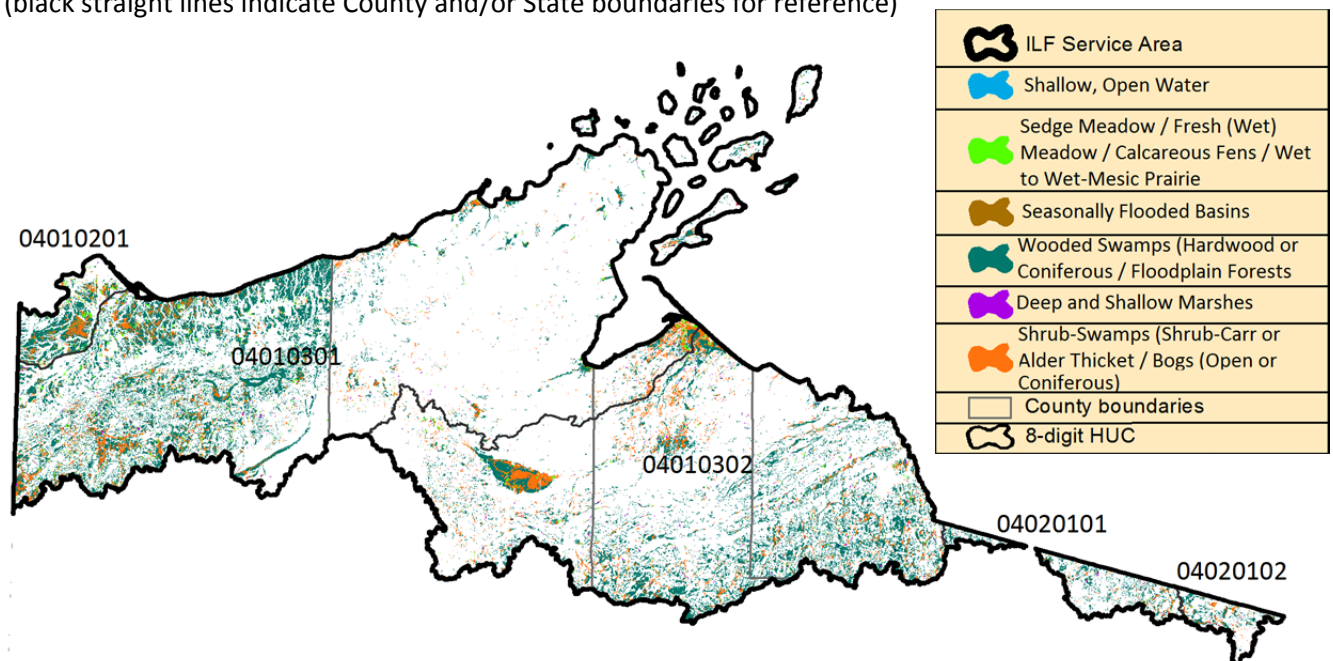
The Lake Superior Watershed Area consists of a largely rural undeveloped cross section with anthropogenic impacts stemming from residential, industrial and commercial development along with

agriculture and the forestry sector as the major contributing threat factors. Roads, sidewalks, bridges and wastewater treatment plants along with ponds are some of the activities that contribute to the majority of permitted actions. As the northern population continues to grow and expand these activities along with agriculture, forestry and mining are positioned as the leading factors that may contribute to wetland losses.

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each wetland type grouping within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland type associated areas.

#### Current Mapped (WWI) Wetland Types per HUC-8

(black straight lines indicate County and/or State boundaries for reference)



#### Current ACRES of Mapped (WWI) Wetland Types per HUC-8

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04010301 - Beartrap-Nemadji Rivers	40.52	8,733.36	12.03	131,701.35	2,003.70	37,216.47	179,761.65
04010302 - Bad-Montreal Rivers	0.00	2,865.01	3.35	99,331.08	2,348.04	31,258.91	135,806.39
04010201 - St. Louis River	8.73	1,688.49	0.00	14,100.07	105.52	4,939.03	21,002.72
04020101 - Black-Presque Isle Rivers	0.00	19.74	0.00	1,646.99	37.41	195.62	1,899.76
04020102 - Ontonagon River	NA	NA	NA	NA	NA	NA	NA

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04010301 - Beartrap-Nemadji Rivers	0.02%	4.86%	0.01%	73.26%	1.11%	20.70%	100.00%
04010302 - Bad-Montreal Rivers	0.00%	2.11%	0.00%	73.14%	1.73%	23.02%	100.00%
04010201 - St. Louis River	0.04%	8.04%	0.00%	67.13%	0.50%	23.52%	100.00%
04020101 - Black-Presque Isle Rivers	0.00%	1.04%	0.00%	86.69%	1.97%	10.30%	100.00%
04020102 - Ontonagon River	NA	NA	NA	NA	NA	NA	NA

The information above depicts the wetland types represented by current WI Wetland Inventory Mapping throughout the service area. This information was utilized for compatibility purposes to reinforce the wetland type goals and objectives and direct projects that are sustainable within surrounding wetland community landscapes.

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.

8. Restore, enhance, establish and/or preserve 15 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Beartrap-Nemadji Rivers HUC – 04010301**

This watershed has lost approximately 5.76% of its overall historic wetlands, which is relatively low for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 63.285 acres of wetland loss, which represent the highest known losses within this overall service area. Floodplain Forests have sustained the greatest percent of historic losses at 19.23%, while Wooded Swamps and Bogs have also lost significant wetland acreage. Permit trends show current losses trending high with Deep and Shallow Marshes, Sedge Meadows and Fresh (Wet) Meadows. The overall land use within this watershed is comprised of 86.96% natural categories including large quantities of deciduous and evergreen forests along with woody wetlands. Currently mapped wetland community types are dominated by 73.26% forested wetland followed by 20.70% shrubs classes. Therefore, replacing Floodplain Forests and Wooded Swamps along with Shrub Swamps will fit well within this watershed given the overall forested land use and compatible mapped wetland community dominant types. These wetland types will also be better equipped to shade out aggressive invasive species and reconnect valuable wildlife corridors that have suffered from fragmentation over time. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Northern Sedge Meadow, Floodplain Forests, Ephemeral Wetlands, Great Lakes Ridge and Swale Wetlands, Interdunal Wetlands and Bogs (Open of Coniferous). Given the relatively small overall loss of historic wetlands and low overall land use impacts, preservation may pose a good opportunity for performing compensatory mitigation.

- Restore and enhance Floodplain Forests, Wooded Swamps (Hardwood or Coniferous), Shrub Swamps (Shrub-Carr or Alder Thicket) and Sedge Meadows.
- Preserve Floodplain Forests, Ephemeral Wetlands, Great Lakes Ridge and Swale Wetlands, Interdunal Wetlands and Bogs (Open of Coniferous).

**Bad-Montreal Rivers HUC – 04010302**

This watershed has lost approximately 11.67% of its overall historic wetlands, which is relatively high for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 1.061 acres of wetland loss, which represent relatively low known losses within this overall service area. Floodplain Forests have sustained the greatest percent of historic losses at 31.11%, followed by Wooded Swamps at 11.24% while bogs have also lost significant wetland acreage. Permit trends do not specify the greatest type of losses. The overall land use within this watershed is comprised of 91.35% natural categories including large quantities of deciduous and evergreen forests along with woody wetlands. Currently mapped wetland community types are dominated by 73.14% forested wetland followed by 23.02% shrubs classes. Therefore, replacing Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Shrub Swamps will fit well within this watershed given the overall forested land use and compatible mapped wetland community dominant types. These wetland types will also be better equipped to shade out aggressive invasive species and reconnect valuable wildlife corridors that have suffered from fragmentation over time. The WI Wildlife Action Plan also shows this general

watershed area as an opportunity area for the management of the following rare wetlands: Northern Sedge Meadow, Floodplain Forests, Ephemeral Wetlands, Great Lakes Ridge and Swale Wetlands, Interdunal Wetlands and Bogs (Open or Coniferous).

- Restore and enhance Floodplain Forests, Wooded Swamps (Hardwood or Coniferous), Shrub Swamps (Shrub-Carr or Alder Thicket) and Sedge Meadows.
- Preserve Floodplain Forests, Ephemeral Wetlands, Great Lakes Ridge and Swale Wetlands, Interdunal Wetlands and Bogs (Open or Coniferous).

#### **St. Louis River HUC – 04010201**

This watershed has lost approximately 0.2% of its overall historic wetlands, however PRW and WWI data is not well represented given the lack of Douglas County intersect data. Corps permitted actions over the past 5 years depict 4.367 acres of wetland loss, which represent the second highest known losses within this overall service area. Wooded Swamps have sustained some historic losses while permit trends specify Shrub Swamps having the greatest losses. The overall land use within this watershed is comprised of 78.24% natural categories including large quantities of deciduous forests along with woody wetlands. This watershed also has the highest quantity of developed land use comprising 19.98% of its area. Currently mapped wetland community types are dominated by 73.14% forested wetland followed by 23.02% shrubs classes. Therefore, replacing Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Shrub Swamps (Hardwood or Coniferous) should fit well within this watershed given the overall forested land use and compatible mapped wetland community dominant types. These wetland types will also be better equipped to shade out aggressive invasive species and reconnect valuable wildlife corridors that have suffered from fragmentation over time. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Boreal Rich Fen, Northern Sedge Meadow, Floodplain Forest, Ephemeral Ponds and Open Bog. Given the lack of intersect data and mapped potentially restorable wetland areas forthcoming advanced watershed planning along with preservation may pose a good opportunity for performing compensatory mitigation.

- Restore and Enhance Floodplain Forests, Wooded Swamps (Hardwood or Coniferous) and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Boreal Rich Fen, Sedge Meadow, Floodplain Forest, Ephemeral Ponds and Bogs (Open or Coniferous).
- Take actions that support wetland projects associated with the St. Louis River Area of Concern program.

#### **Black-Presque Isle Rivers – 04020101**

This watershed has lost approximately 19.89% of its overall historic wetlands, however PRW and WWI data is not well represented given the lack of Vilas County intersect data. Corps permitted actions over the past 5 years depict 0 acres of wetland loss. While Shallow Open Water wetlands have sustained the greatest percentage of historic loss at 92.27%, their estimated acreage losses were very low. Wooded Swamps have sustained 19.31% historic loss with significant corresponding acreage followed by Bogs at 19.48% loss. The overall land use within this watershed is comprised of 95.08% natural categories including large quantities of deciduous forests along with woody wetlands and open water. This watershed also has a low quantity of developed land use comprising only 4.77% and the lowest agricultural impacts at 0.14% of its area. Currently mapped wetland community types are dominated by 86.69% forested wetland followed by 10.30% shrubs classes. Therefore, replacing Wooded Swamps (Hardwood or Coniferous) along with Shrub Swamps (Hardwood or Coniferous) should fit well within

this watershed given the overall forested land use and compatible mapped wetland community dominant types. These wetland types will also be better equipped to shade out aggressive invasive species and reconnect valuable wildlife corridors that have suffered from fragmentation over time. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Boreal Rich Fen, Northern Sedge Meadow, Floodplain Forest, Ephemeral Ponds and Open Bog. Given the small overall impacts within this watershed and large portion of existing natural wooded land use areas, preservation may pose the best method for performing compensatory mitigation.

- Restore and Enhance Wooded Swamps (Hardwood or Coniferous) and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Boreal Rich Fen, Sedge Meadow, Floodplain Forest, Ephemeral Ponds and Bogs (Open or Coniferous).

**Ontonagon River – 04020102**

Given the overall lack of supporting intersect data there are currently no goals and objectives associated with this watershed. It should be noted that this watershed represents approximately 1.3% of the overall spatial size of the service area and contained 0 acres of Corps permitted impacts requiring compensatory mitigation over the past 5 years.

**Approved Advanced Watershed Plans (AWP): None****Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

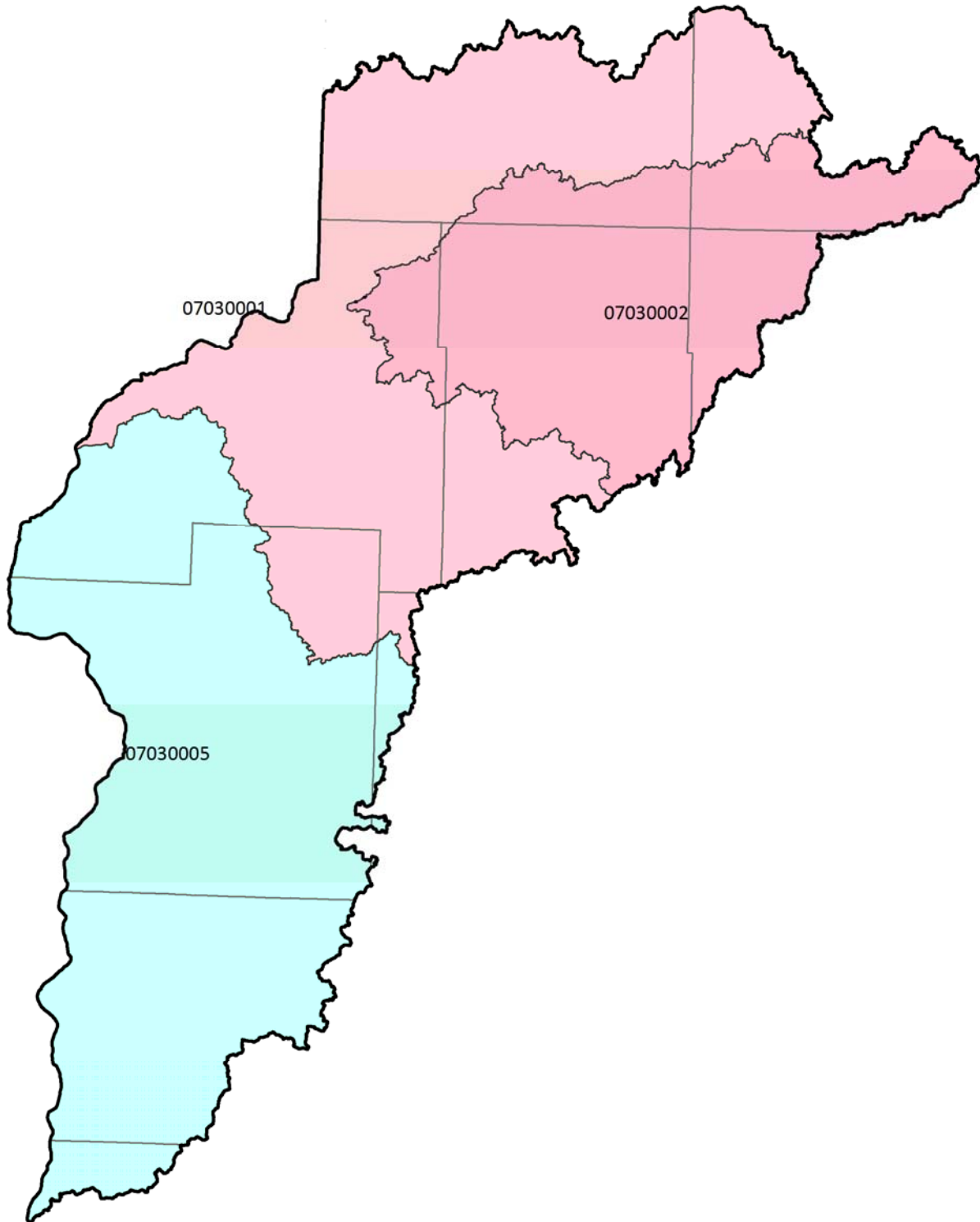
**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## St. Croix CPF

### Element I. Service area:

#### Overall SA Area with separate HUC-8 watersheds designated in color

(county & state boundaries shown in straight lines for further reference)

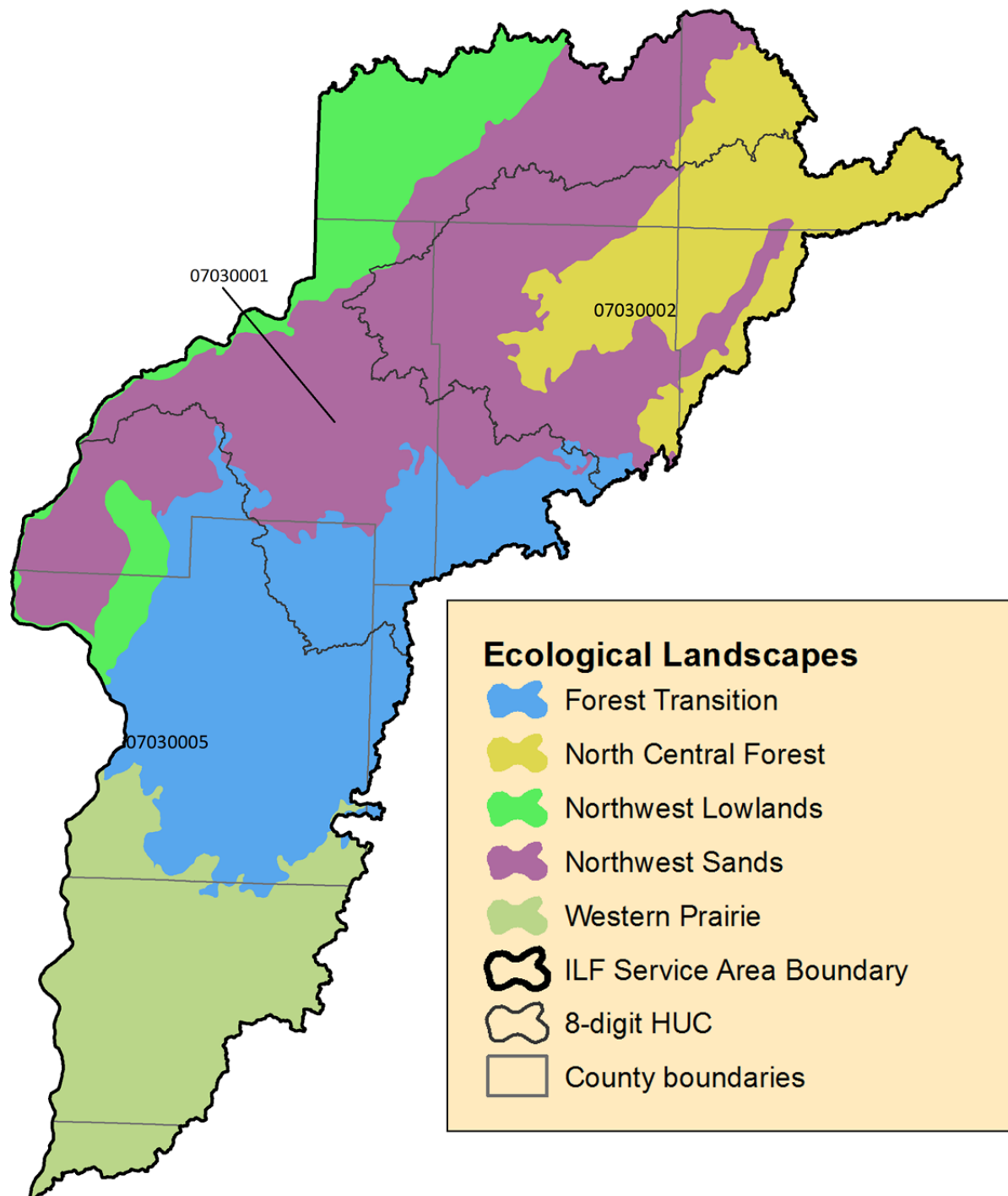


November 12, 2014

The Saint Croix Service area is located at the north western tip of Wisconsin comprised of Douglas, Bayfield, Burnett, Washburn, Polk, Barron and Saint Croix counties and drains an area approximately 4,188 square miles.

Ecological Landscapes include (WDNR 2012):

**Ecological Landscapes per HUC-8**



**Forest Transition** – Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the "Tension Zone") that runs southeast-northwest across the state. The mean growing season is 133 days, mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The growing season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. The Forest Transition was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Most soils are non-calcareous, moderately well-drained sandy loams derived from glacial till, but there is considerable diversity in the range of soil attributes. The area includes sandy soils formed in outwash, as well as organic soils, and loam and silt loam soils on moraines. There are many areas with shallow soils. Drainage classes range from poorly drained to excessively drained. Density of the till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition. Soils throughout the Ecological Landscape have silt loam surface deposits formed in aeolian loess, about 6 to 24 inches thick in much of the area. Major river systems draining this Ecological Landscape include the Wolf, Wisconsin, Black, Chippewa, and St. Croix. Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the Ecological Landscape remains heavily forested, the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared), and the west end is a mixture of forest, lakes, and agricultural land. Population is estimated at 639,625, comprising 11.4% of the state total resulting in a population density of approximately 49 persons/ sq. mile. About 88% of all forested land is privately-owned while 12% belongs to the state, counties or municipalities.

**North Central Forest** – Typical of northern Wisconsin, mean growing season in the North Central Forest is 115 days, the shortest growing season of all Ecological Landscapes in the state. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean annual snowfall is 63 inches. However, heavier snowfall can occur closer to Lake Superior, especially in the northwestern part of the Ecological Landscape in the topographically higher Penoque-Gogebic Iron Range. The cool temperatures and short growing season are not conducive to supporting agricultural row crops such as corn in most parts of the Ecological Landscape. Only six percent of the North Central Forest is in agricultural use. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penoque-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands. Rivers, streams, and springs are common and found throughout this Ecological

Landscape. Major rivers include the Wisconsin, Chippewa, Flambeau, Jump, Wolf, Pine, Popple, and Peshtigo. Large lakes include Namekagon, Courte Oreilles, Owen, Round, Butternut, North Twin, Metonga, Pelican, Pine, Kentucky, Pickerel, and Lucerne. Several large man-made flowages occur here such as the Chippewa, Turtle-Flambeau, Gile, Pine, and Mondeaux. There are several localized but significant concentrations of glacial kettle lakes associated with end and recessional moraines (e.g., the Perkinstown, Bloomer, Winegar, Birchwood Lakes, and Valhalla/Marenisco Moraines.) In southern Ashland and Bayfield counties, the concentrations of lakes are associated with till plains or outwash over till. Lakes here are due to dense till holding up the water table. Rare lake types in the North Central Forest include marl and meromictic lakes. Forests cover approximately 75% of this Ecological Landscape. The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack), non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marsh (including wild rice marshes) are widespread in the North Central Forest. Population is estimated at 244,782, comprising 4.4% of the state total resulting in a population density of approximately 19 persons/ sq. mile. Forty-two percent is publicly owned, mostly by federal, state or county governments.

**Northwest Lowlands** – Typical of northern Wisconsin; the mean growing season is 122 days, mean annual temperature is 41.8 deg. F, mean annual precipitation is 30.6, and mean annual snowfall is 49 inches. The cool temperatures and short growing season are not adequate to support agricultural row crops; less than three percent of the land here is used for agricultural purposes and most of this is in the southern "hook" in Burnett County. The climate is favorable for forests, which cover almost 70% of the Ecological Landscape. The cool temperatures and short growing season, along with numerous and large acid peatlands, result in almost boreal-like conditions in parts of the Northwest Lowlands. The major landforms are ground and end moraines, with drumlins present in the southwestern portion. Topography is gently undulating. In the northern part of the Ecological Landscape many stream valleys run northeast-southwest in roughly parallel courses. This is caused by bedrock ridges that were created by harder strata of lava alternating with weaker sedimentary rocks; these were later tilted upward due to rifting and continental collision. This bedrock feature influences the surface topography of the Northwest Lowlands, especially where glacial deposits are thin. Soils are predominantly loams, with significant acreages of peat deposits in the poorly drained lowlands. Major river valleys have soils formed in sandy to loamy-skeletal alluvium or in non-acid muck. Alluvial soils range from well drained to very poorly drained, and have areas subject to periodic flooding. This Ecological Landscape occupies a major drainage divide, and contains the headwaters of many streams that flow north toward Lake Superior or south toward the St. Croix River system. Important rivers include the St. Croix, Black, Tamarack, Spruce, and Amnicon. Lakes are uncommon except in the heavily agricultural southernmost part of the Ecological Landscape in Burnett County. Impoundments, all fairly small, have been created by constructing dams on the Tamarack and Black rivers, and several creeks. The St. Croix River is fed by springs, spring ponds, and seepages. The present-day forests remain extensive and relatively unbroken,

occupying about 68% of the landscape. Forests consist mainly of aspen, paper birch, sugar maple, basswood, spruce and fir. Minor amounts of white pine, red pine and red oak are also present. Older successional stages are currently rare, as almost all of this land is managed as "working forests". The large undisturbed peatland complexes consist of mosaics of black spruce-tamarack swamp, muskeg, open bog, poor fen, shrub swamp, and occasionally, white cedar swamp. The St. Croix River corridor includes forested bluffs and terraces, which support communities unlike those found in most other parts of the Ecological Landscape. These include mesic maple-basswood forest, dry-mesic forests of oak or oak mixed with pine, black ash-dominated hardwood swamps, and numerous forested seeps. Less extensive areas of marsh and sedge meadow also occur along the St. Croix. In most of this Ecological Landscape minor amounts of land are devoted to agricultural and residential uses, and most of these land uses are concentrated along State Highway 35. The major exception to this pattern is the area that wraps around the south end of the Northwest Sands which is a mix of agricultural lands and scattered oak or oak-pine woodlots. Population is estimated at 43,721, comprising 0.8% of the state total resulting in a population density of approximately 32 persons/ sq. mile. The most significant Federal ownership is the St. Croix National Scenic Riverway, administered by the National Park Service.

**Northwest Sands** – Mean annual temperature (41.30 F) is similar to other northern Ecological Landscapes. Annual precipitation averages 31.4 inches and annual snowfall about 61 inches, also similar to other northern Ecological Landscapes. The growing season is short and averages 121 days. Although there is adequate rainfall to support agricultural row crops such as corn, the sandy soil and short growing season limit row crop agriculture, especially in the northern part of the Ecological Landscape. This Ecological Landscape is the most extensive and continuous xeric glacial outwash system in northern Wisconsin. It has two major geomorphic components. One is a large outwash plain pitted with depressions, or "kettle lakes." The other component is a former spillway of Glacial Lake Duluth (which preceded Lake Superior) and its associated terraces. The spillway is now a river valley occupied by the St. Croix and Bois Brule Rivers. The hills in the northeast are formed primarily of sand, deposited as ice-contact fans at the outlet of subglacial tunnels. Lacustrine deposits (especially fine materials of low permeability such as clays) from Glacial Lake Grantsburg underlie Crex Meadows and Fish Lake Wildlife Areas, and are responsible for impeding drainage, leading to the formation of the large wetlands there. Upland soils are typically sands or loamy sands over deeper-lying strata of sand, or sand mixed with gravel. These soils drain rapidly, leading to xeric, droughty conditions within the Ecological Landscape. Wetlands in low-lying depressions have organic soils of peat or muck. This Ecological Landscape has significant concentrations of glacial kettle lakes, most of them seepage lakes, a well-developed pattern of drainage lakes, and several large wetland complexes. The lakes cover roughly 4.8% of the area of the Northwest Sands, the third highest percentage among ecological landscapes in Wisconsin. The headwaters of the St. Croix and Bois Brule rivers are here. Major rivers include the St. Croix, Namekagon, Yellow, and Totagatic. Springs and seepages are common along the Upper Bois Brule but local elsewhere. Landcover is a mix of dry forest, barrens, grassland, and agriculture, with wetlands occupying significant parts of the bed of extinct Glacial Lake Grantsburg, kettle depressions, and some river valleys. Within the forested portion, pine, aspen-birch, and oak are roughly equally dominant. The maple-basswood, spruce-fir, and bottomland hardwood forest types occupy small percentages of the Ecological Landscape's forests. The open lands include a large proportion of grassland and shrubland.

Emergent/wet meadow and open water are significant in the southern part of the Northwest Sands. There is very little row-crop agriculture. Population is estimated at 90,010, comprising 1.6% of the state total resulting in a population density of approximately 20 persons/ sq. mile. Forty-eight percent of the land and water in this landscape is in public ownership.

**Western Prairie** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.1, and mean annual snowfall is 45.4 inches. The climate and topography was favorable to frequent fires that resulted in prairie vegetation occurring in almost a third of the area prior to Euro-American times. The length of the growing season, adequate precipitation, and favorable temperatures make the climate favorable for agriculture, which is prevalent here. The Landscape is entirely glaciated. Major landforms are rolling till plain, with end moraine in the northwest and small areas of outwash. Soils are predominantly formed in loamy till glacial deposits, while some are in outwash. A loess cap of aeolian silt is 6 to 48 inches thick over the surface. The dominant soil is well drained and loamy with a silt loam surface, moderate permeability, and moderate available water capacity. The Lower St. Croix River forms the western boundary of this Ecological Landscape (however, note that this Ecological Landscape is part of a larger ecological region, Subsection 222 Md, which extends west into Minnesota). Other important though much smaller rivers include the Apple, Kinnickinnic, and Willow. Most of the rivers drain westward to the St. Croix, with several draining south directly into the Mississippi, and a few flowing southeast to the Chippewa. Inland lakes, mostly seepage lakes and ponds, are most common in the northwestern part of the Landscape, in an area known informally as Wisconsin's "Prairie Pothole Region". There are multiple dams on the Willow River, and the Kinnickinnic has been dammed at River Falls. Many wetlands have been lost or severely altered by agricultural activities, which have been widespread and intensive in this productive Landscape. Almost half of the current land cover is agricultural crops and about one third of the area is grasslands, with smaller amounts of forest, open water, open wetlands, and urban areas. The major forest types are maple-basswood and oak-hickory, with lesser amounts of lowland hardwoods. Native coniferous forests are rare, and are limited to a few tamarack swamps and small scattered stands of pine on steep rocky slopes. Population is estimated at 120,708, comprising 2.2% of the state total resulting in a population density of approximately 77 persons/ sq. mile. Only three percent of the Western Prairie is in public ownership, much of it associated with the St. Croix, Kinnickinnic, and Willow rivers.

This Service area can be further broken down into three smaller HUC-8 watersheds, the Lower St. Croix River (07030005), Upper St. Croix River (0703001) and the Namekagon River (07030002). ). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

## **Element II. Threats:**

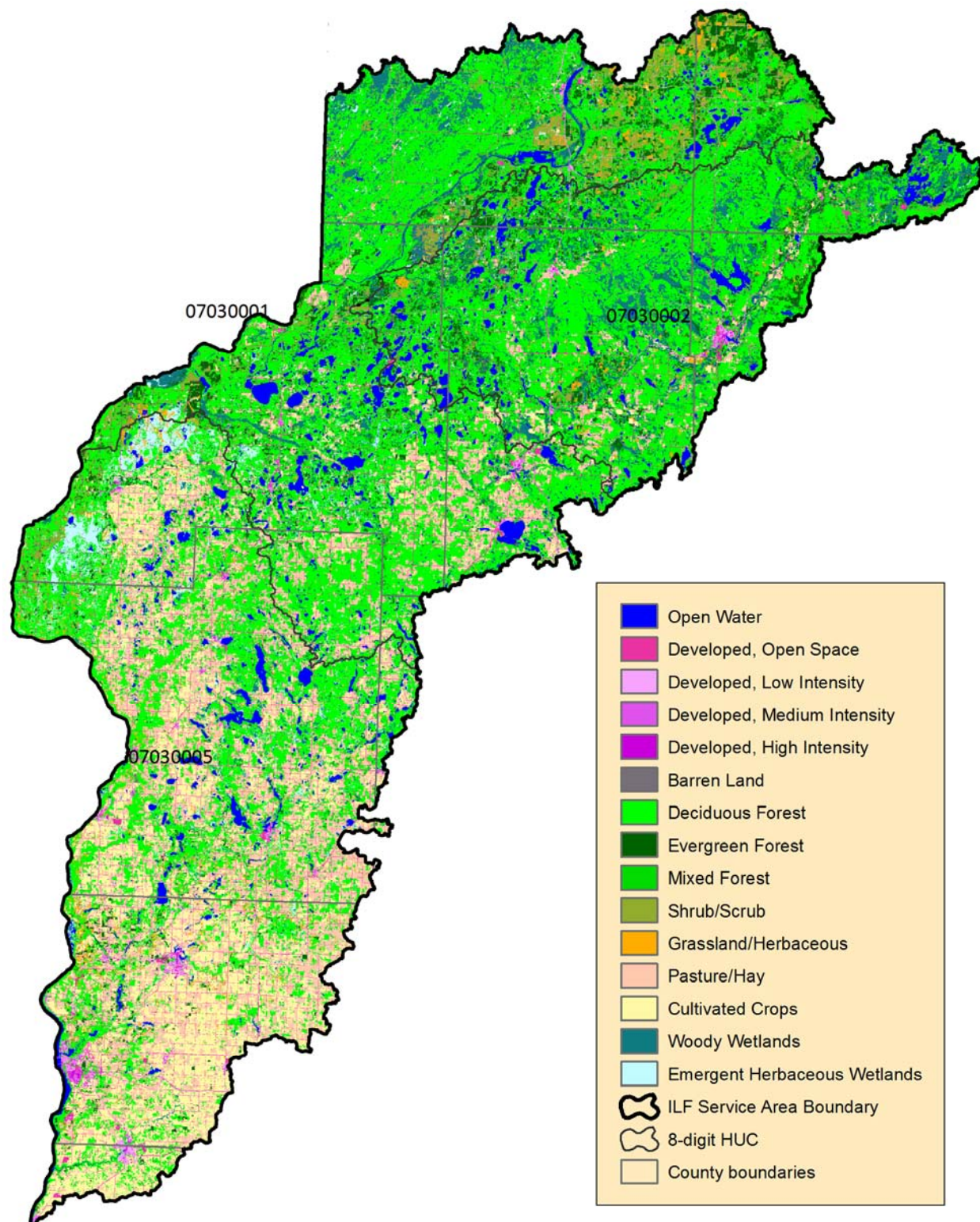
Overall wetland resource threats within this service area include water quality in the Upper and Lower St. Croix watersheds resulting in 303d listed impaired waters, invasive species brought in through high recreational usage and fragmentation of corridors, high utilization of groundwater in the southeastern portions and land use changes. Major threat considerations in the northern portions of this service area

(Northwest Sands **WDNR 2012**) have seen increased lakeshore development, partly because of the areas close proximity to the Minneapolis-St. Paul metropolitan area. The sandy soils in these areas are low in productivity and highly erodible and great care must be taken when planning and conducting land use activities to avoid causing damage to slopes and fragile vegetation. Many rare plants and animals occur here, especially in the barrens and sedge meadow habitats, and these need consideration when planning and conducting management activities. Increasing connectivity between resource patches and reducing habitat fragmentation and isolation, are major threats to consider for these central portions. Wetland invasive species are present in some wetlands and may be increasing. The north and eastern portions of this service area (Northwest Lowlands **WDNR 2012**) is under threat of continued resource fragmentation of its extensive forests, wetlands and potential travel and dispersal corridors. The St. Croix corridor is heavily used by migratory birds and may be important to other taxa as well. The northwestern portions of the service area (North Central Forest **WDNR 2012**) major considerations is clarification of the roles played by and ecological relationships among public, private, industrial, and tribal lands from a conservation, socioeconomic, and recreational perspectives. In recent years there has been documentation of widespread negative impacts to forests from: excessive deer browse; invasive earthworms, insects, plants and pathogens; divestitures of large private holdings (especially estates and industrial forests); increased parcelization; and the development of shoreline habitats. Other important threats to consider include: the potential implications of climate change; ecological impacts of increased biomass harvest; forest type conversions; forest simplification and homogenization; and fragmentation. Moving into the central portions of the service area (Forest Transition **WDNR 2012**), which has lost over half of its historic forests (though this is highly variable in different areas), and overall, is one of the most deforested landscapes north of the Tension Zone. Land use is a mosaic of agricultural land, forest, and recreational lands with associated resource pressures negatively impacting wetland areas. Habitat fragmentation and large power dams on the St. Croix further add to the threats in these central areas. The southern portions of this service area (Western Prairie **WDNR 2012**) see threats stemming from its overall dominant agricultural land use, with increasing residential pressures along the St. Croix River. The Lower St. Croix River supports many rare aquatic species, but recreational pressure is high and increasing given the close proximity to the Twin Cities of this overall area.

The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

**Current Land Use:****Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Land Use Threats (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07030005 - Lower St. Croix River	1,067,509	45,999	501,606	519,904	4.31%	46.99%	48.70%
07030001 - Upper St. Croix River	934,500	32,048	96,208	806,244	3.43%	10.30%	86.28%
07030002 - Namekagon River	686,926	67,365	29,963	589,599	9.81%	4.36%	85.83%

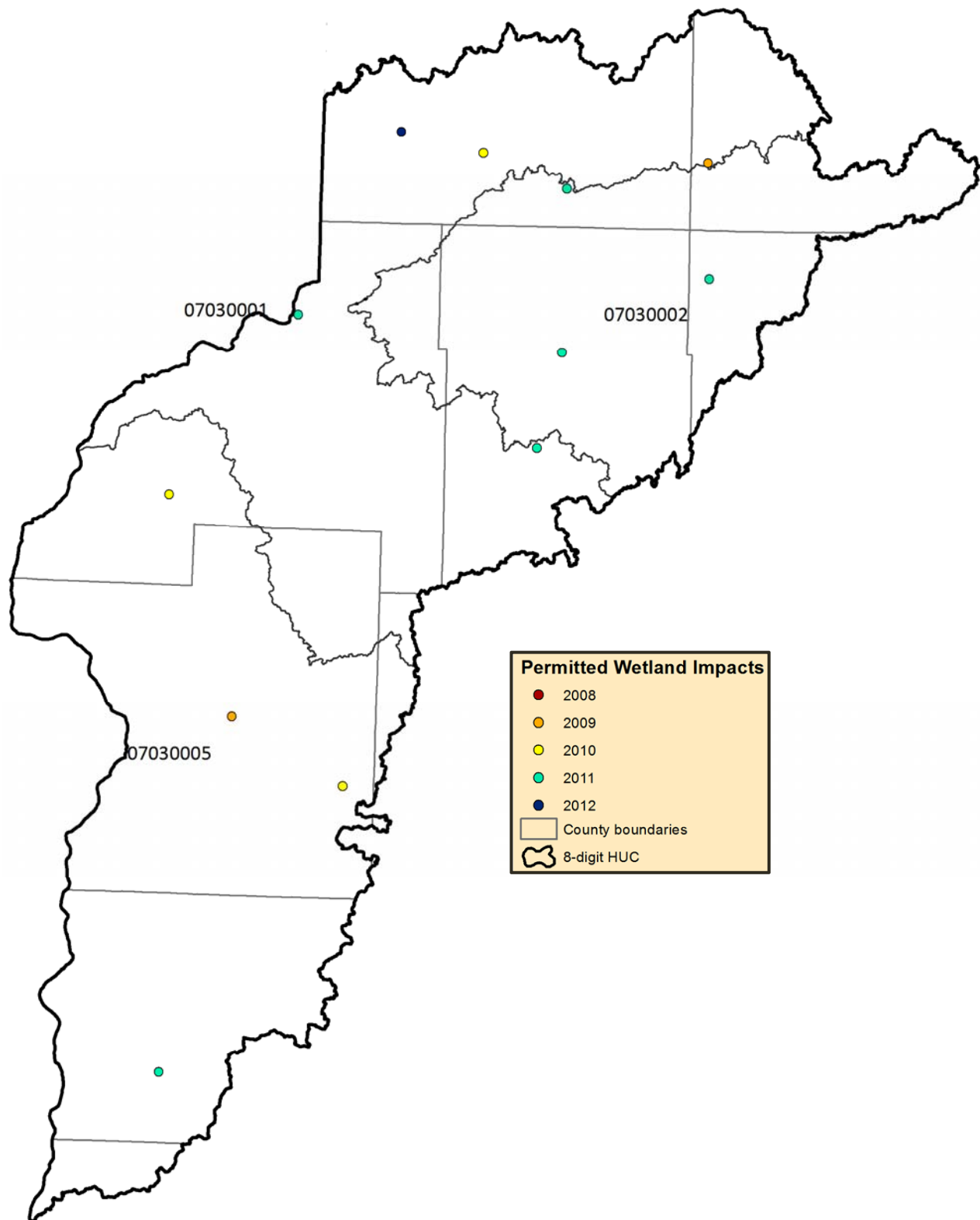
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Lower St. Croix River HUC-07030005 is under the greatest threat from agriculture with 46.99% of its area containing agriculture based land uses and only 48.70% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07030005 - Lower St. Croix River	7%	0%	86%	0%	0%	7%	2.452
07030001 - Upper St. Croix River	18%	22%	13%	21%	0%	26%	1.789
07030002 - Namekagon River	0%	24%	8%	0%	0%	68%	0.543

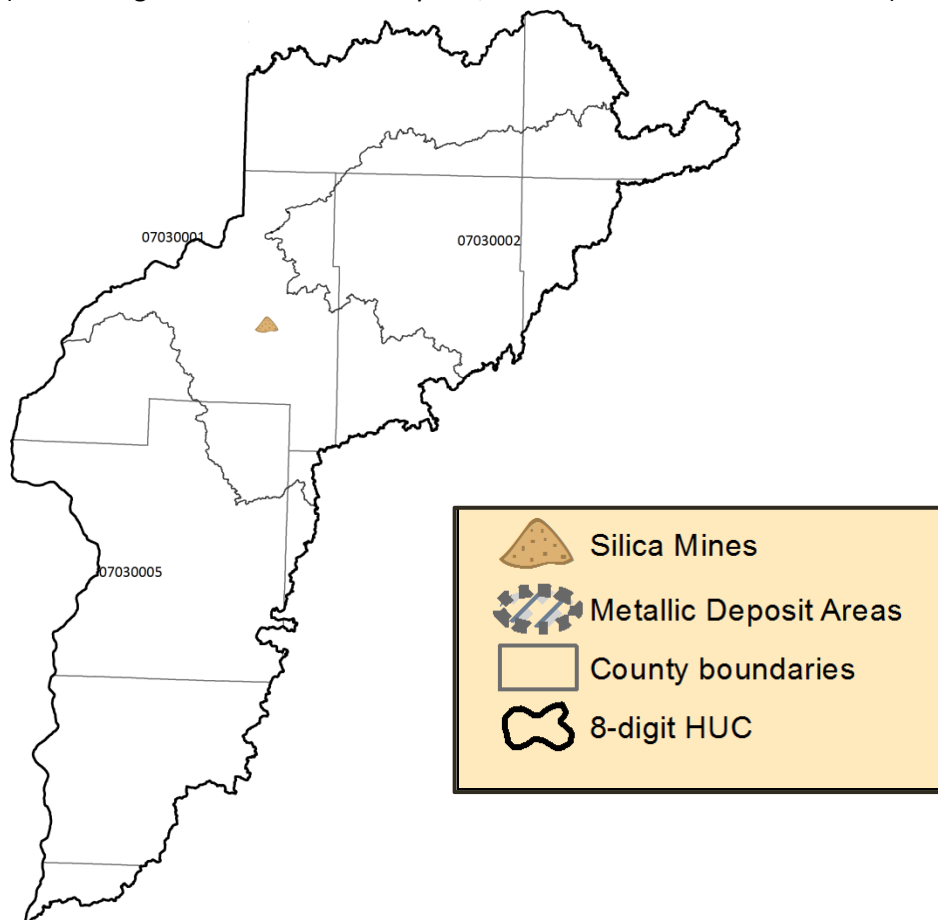
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

While the St. Croix SA does not contain any current metallic exploration areas it does intersect with portions of non-metallic mining zones as depicted in the below map. These Frac Sand mines and processing facilities fall within the Upper St. Croix River HUC-07030001 thus presenting an increased future threat within this watershed giving greater priority to this HUC-8.

**Potential Mining Impacts per HUC-8**

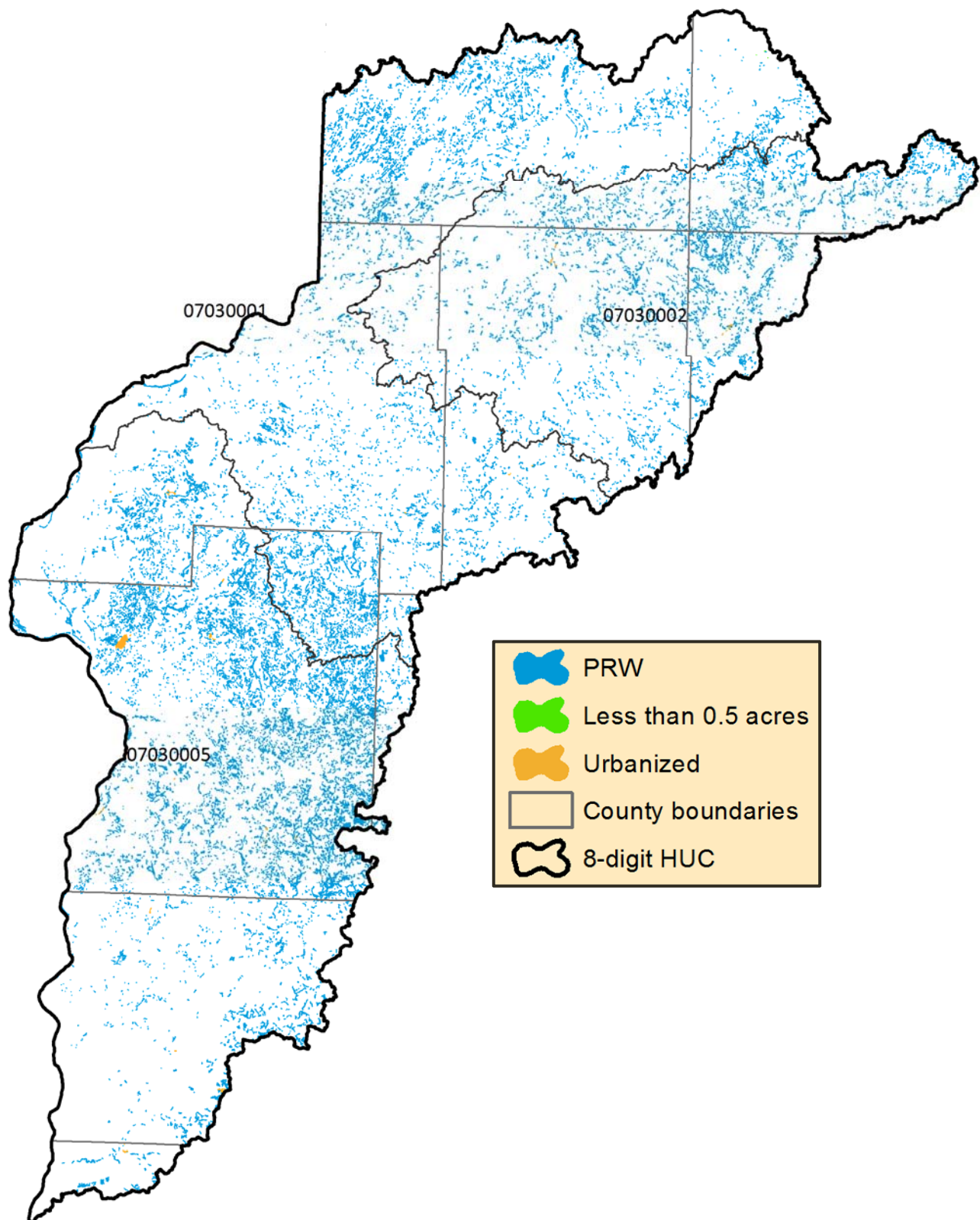
(black straight lines indicate County and/or State boundaries for reference)



**Element III. Historic Loss:**

This Service area is known for its rich water based resources that brought people to the area to utilize and enjoy them. Historically logging and agriculture practices dominated the early economy along with dams for milling and eventually electricity. These changes to the landscape have altered and impacted the character of wetlands changing their hydrology and vegetative communities and influencing their soil composition (***WDNR Basin Website 2013***). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



**Overall Estimated Historic Wetland Percent Loss Summary per HUC-8**

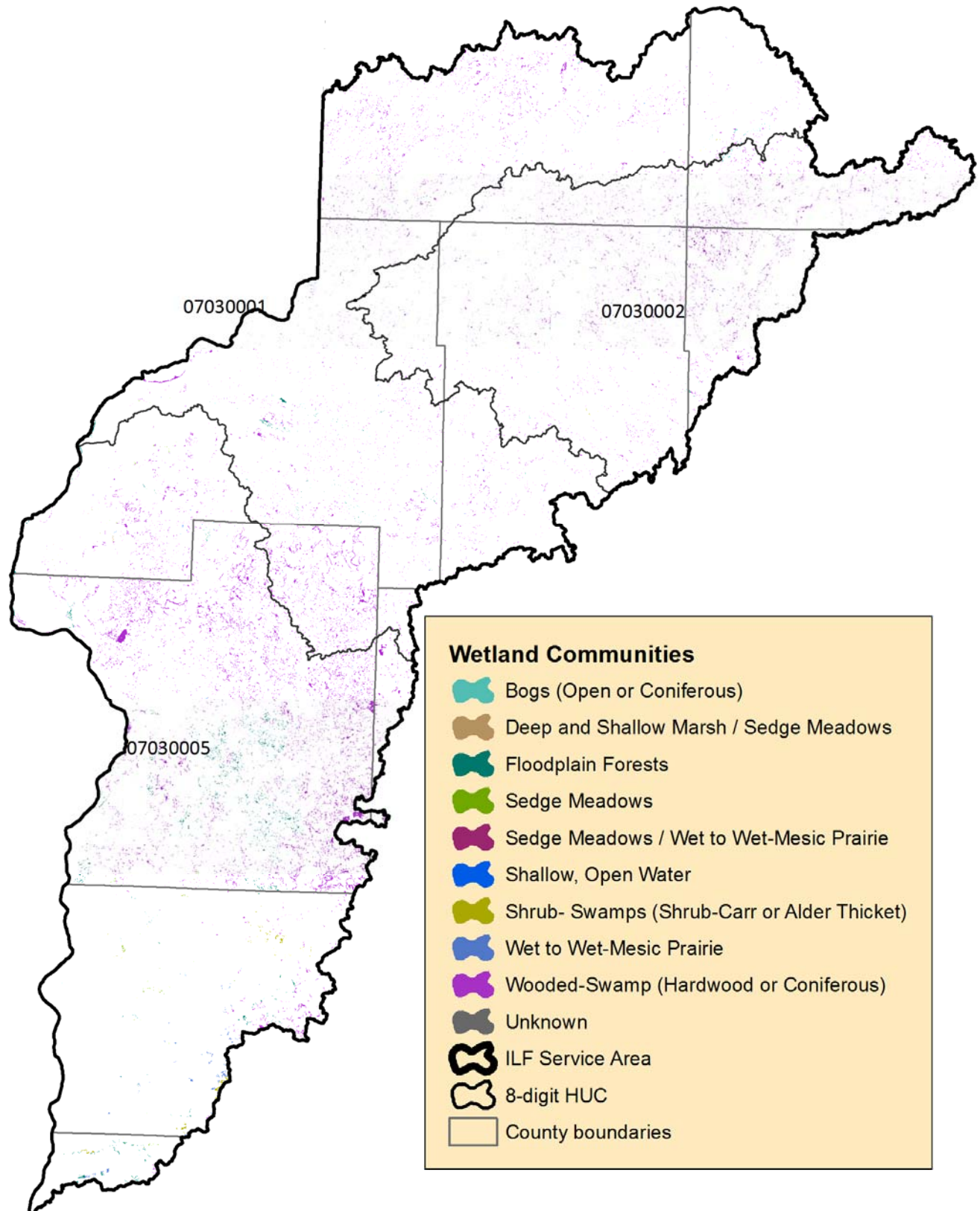
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
07030005 - Lower St. Croix River	29,560	18.90%
07030001 - Upper St. Croix River	13,617	7.79%
07030002 - Namekagon River	8,239	7.36%

The information above identifies that the Lower St. Croix River HUC-07030005 has sustained the greatest historic loss of wetlands.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
07030005 - Lower St. Croix River	0.09%	1.91%	29.94%	8.29%	#DIV/0!	7.97%	5.33%	#DIV/0!	23.40%	26.72%
07030001 - Upper St. Croix River	1.41%	#DIV/0!	6.27%	2.21%	#DIV/0!	4.11%	3.93%	#DIV/0!	#DIV/0!	9.15%
07030002 - Namekagon River	3.86%	#DIV/0!	4.96%	#DIV/0!	#DIV/0!	5.44%	11.68%	#DIV/0!	#DIV/0!	8.30%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

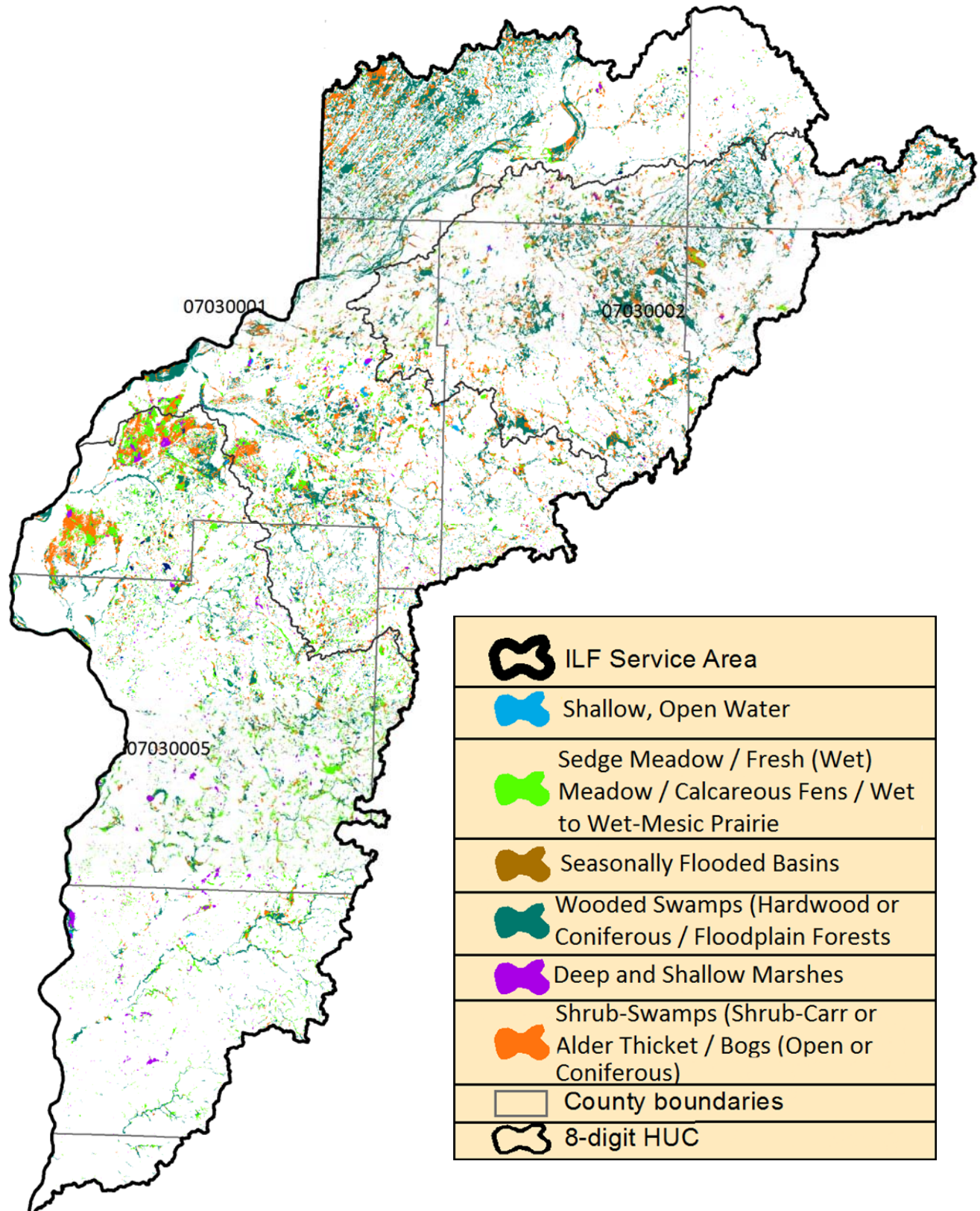
**Element IV. Current Conditions:**

The St. Croix Watershed Service area consists of a large dispersal of water resources including both groundwater and surface water fed areas. Water rich, this watershed area consists of primarily rolling glacial terrain ranging from flat outwash plains to knob and kettle moraines. This area is growing in popularity as a result of its abundant streams, lakes, wetlands rich forest, wildlife and fisheries as both a place for recreation and general living. Following deciduous forested areas, combined agricultural areas dominate the land use and changes to more row crops and larger confined animal feeding operations are cause for water resource concern from non-point runoff, erosion and manure management. Increased growth and its associated development activities are also major threats as they are occurring largely along shorelines and other resource areas (*WDNR Basin Website 2013*).

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07030001 - Upper St. Croix River	2,189.00	24,425.95	12.25	101,746.48	4,910.54	53,595.84	186,919.70
07030005 - Lower St. Croix River	2,124.75	46,520.11	21.24	44,397.36	9,491.93	32,653.00	135,249.40
07030002 - Namekagon River	1,288.02	8,389.25	0.00	70,678.75	3,280.11	39,219.86	122,871.06

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07030001 - Upper St. Croix River	1.17%	13.07%	0.01%	54.43%	2.63%	28.67%	100.00%
07030005 - Lower St. Croix River	1.57%	34.40%	0.02%	32.83%	7.02%	24.14%	100.00%
07030002 - Namekagon River	1.05%	6.83%	0.00%	57.52%	2.67%	31.92%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.

7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.
8. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.
9. Restore, enhance, establish and/or preserve 5 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Lower St. Croix River HUC – 07030005**

This watershed has lost approximately 18.90% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 2.452 acres of wetland loss, which represent the highest known losses within this overall service area. Floodplain Forests and Wooded Swamps have sustained the greatest percent of historic losses at 29.94% and 26.72% respectively, followed by Wet to Wet-Mesic Prairie at 23.40% with all having significant acreage losses. Permit trends show the greatest impact trends with Deep and Shallow Marshes and Shrub Swamps. The overall land use within this watershed is largely split between natural categories at 48.70% followed closely by agriculture at 46.99%. The natural land use area is comprised of mainly deciduous forest, emergent herbaceous wetlands, grassland/herbaceous and open water, while the agriculture is comprised of pasture/hay and cultivated crops. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairie along with Wooded Swamps and Floodplain Forests. Therefore, replacing Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Sedge Meadows, Fresh (Wet) Meadows will fit well within this watershed given the overall forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Wet Prairie, Wet-Mesic Prairie, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest and Ephemeral Pond.

- Restore and enhance Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Sedge Meadows, Fresh (Wet) Meadows.
- Preserve Wet Prairie, Wet-Mesic Prairie, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest and Ephemeral Pond.

**Upper St. Croix River HUC – 07030001**

This watershed has lost approximately 7.79% of its overall historic wetlands, which is the relatively low for this service area and contains portions of Douglas County where WWI/PRW intersect data is missing. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity

for project development. Corps permitted actions over the past 5 years depict 1.789 acres of wetland loss, which represent the second highest known losses within this overall service area. Wooded Swamps and Floodplain Forests have sustained the greatest percent of historic losses at 9.15% and 6.27% respectively, followed by Shallow Open Water and Shrub Swamps. Permit trends show the greatest impact trends with Shrub Swamps, Shallow Open Water, Sedge Meadows, Fresh (Wet Meadow) and Wet to Wet-Mesic Prairie. The overall land use within this watershed is largely natural at 86.28% comprised of mainly deciduous forest, mixed forest, evergreen forest, woody wetland and shrub/scrub. While agriculture land use is only 10.30% and comprised of mainly pasture/hay areas. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall mixed forest, woody wetland and shrub/scrub land use and compatible mapped wetland community dominant types. Forested and Shrub vegetation will be important for shade in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Wet Prairie, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest, Ephemeral Pond and Bog (Coniferous or Open).

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forest and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Wet Prairie, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest, Ephemeral Pond and Bog (Coniferous or Open).
- Select project type and locations that support the principles of existing listed Advanced Watershed Plans.

#### **Namekagon River      HUC – 07030002**

This watershed has lost approximately 7.36% of its overall historic wetlands, which is the relatively low for this service area and contains portions of Douglas County where WWI/PRW intersect data is missing. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 0.543 acres of wetland loss, which represent the lowest known losses within this overall service area. Shrub Swamps and Wooded Swamps have sustained the greatest percent of historic losses at 11.68% and 8.30% respectively, followed by Shallow Open Water and Floodplain Forests. Permit trends show the greatest impact trends with Shrub Swamps. The overall land use within this watershed is largely natural at 85.83% comprised of mainly deciduous forest, mixed forest, evergreen forest, woody wetland and Open Water. Agriculture land use is only 4.36% and comprised of mainly pasture/hay areas. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall mixed forest, woody wetland and shrub/scrub land use and compatible mapped wetland community dominant types. Forested and Shrub vegetation will be important for shade in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Boreal Rich Fen, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest, Ephemeral Pond and Bogs (Coniferous or Open).

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forest and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Boreal Rich Fen, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest, Ephemeral Pond and Bogs (Coniferous or Open).

**Existing Advanced Watershed Plans (AWP):**

United States Army Corps of Engineers and Wisconsin Department of Natural Resources. (November 2013). *Watershed Study Report for the Headwaters of the St. Croix River Basin, WI*. Retrieved from: <http://dnr.wi.gov/lakes/publications/stcroix/>

**Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

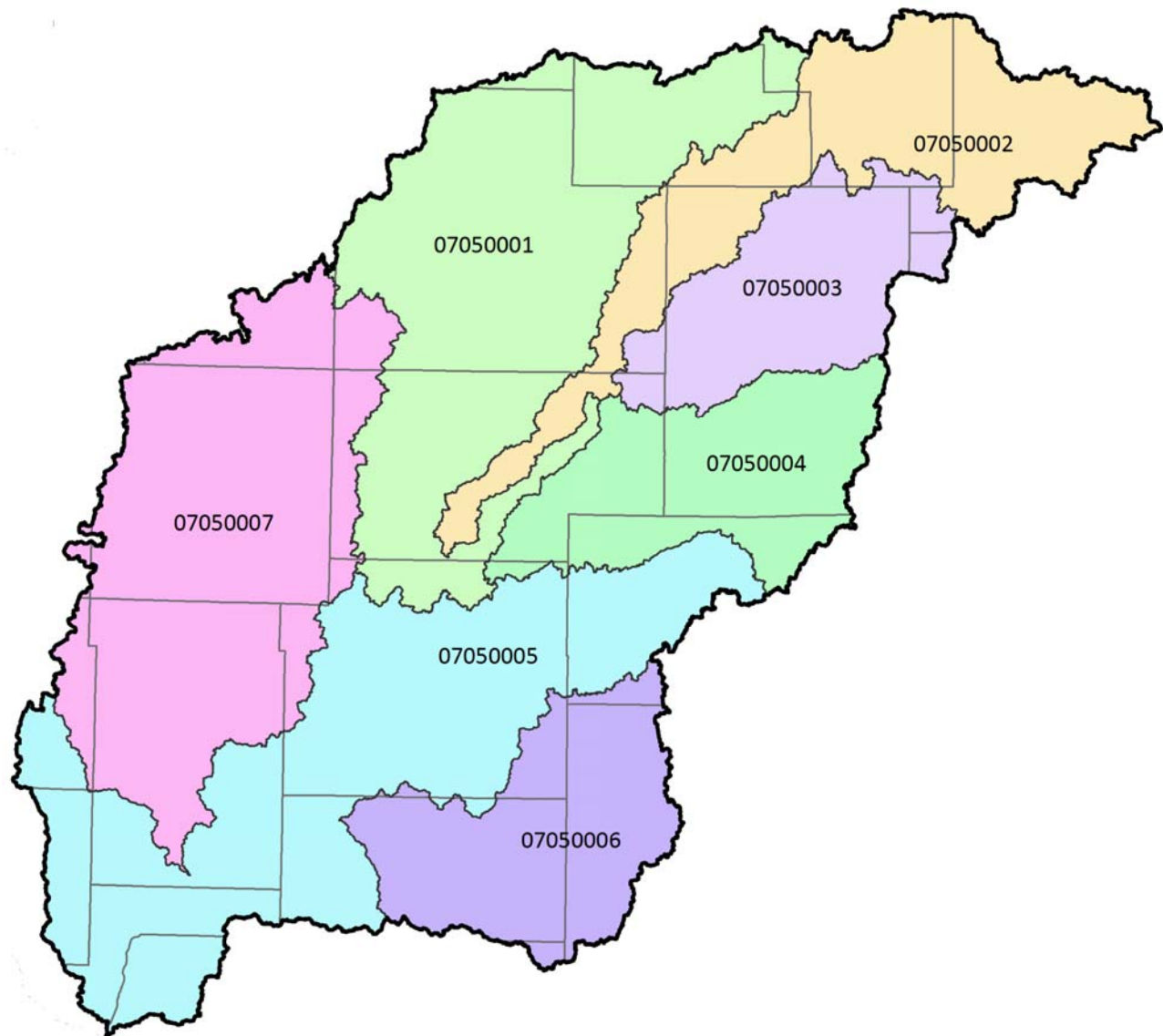
**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Chippewa CPF

### Element I. Service area:

#### Overall SA Area with separate HUC-8 watersheds designated in color

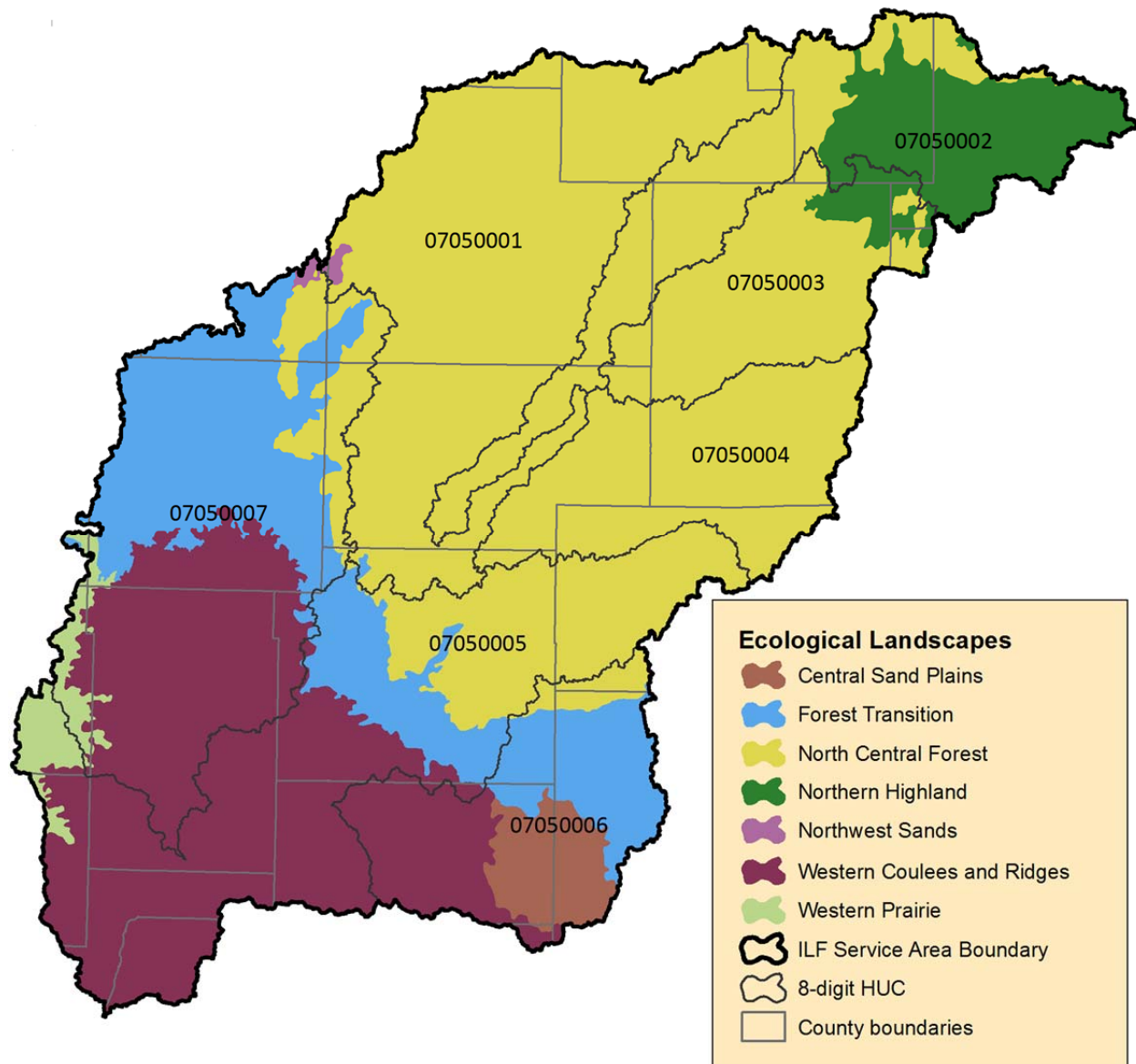
(county & state boundaries shown in straight lines for further reference)



The Chippewa Service area is the largest of the 12 service areas, located in the northern western portion of Wisconsin comprised of Bayfield, Burnett, Polk, Ashland, Iron, Vilas, Washburn, Sawyer, Price, Oneida, Barron, Rusk, Saint Croix, Dunn, Chippewa, Taylor, Pierce, Pepin, Buffalo, Eau Claire, Clark and Jackson counties and draining an area of approximately 9,583 square miles.

Ecological Landscapes include (WDNR2012):

## Ecological Landscapes per HUC-8



**Central Sand Plains** – Typical of southern Wisconsin, mean annual temperature is 43.8 deg. F, mean annual precipitation is 32.8 inches, and mean annual snowfall is 45.0 inches. However, the mean growing season (135 days) is almost 19 days less than other southern Wisconsin ecological landscapes. Summer temperatures can drop below freezing at night in low-lying areas, restricting the distribution of some native plants. The short growing season and summer frosts limit agriculture, especially west of the Wisconsin River where commercially-grown cranberries are an important crop. East of the Wisconsin River the growing season is somewhat longer (by approximately 11 days), with fewer nights of potential summer frost. In this area agriculture is focused primarily on cool season crops such as potatoes, vegetables, and early maturing corn. Center pivot irrigation is widely used to water crops in this region of sandy soils. Grazing is a common land use practice in some areas. An extensive, nearly level expanse

of lacustrine and outwash sand that originated from a huge glacial lake characterizes much of the Central Sand Plains. Sand was deposited in Glacial Lake Wisconsin by outwash derived from melting glaciers to the north. Exposures of eroded sandstone bedrock remnants as buttes, mounds and pinnacles are unique to this Ecological Landscape. Sandstone is also exposed as cliffs along the Black River and some of its tributaries. Most soils formed from deep sand deposits of glacial lacustrine or outwash origin or in materials eroded from sandstone hillslopes and sometimes with a surface of wind-deposited (aeolian) sand. These soils are excessively drained, with very rapid permeability, very low available water capacity, and low nutrient status. In lower-lying terrain where silty lacustrine material impedes drainage, the water table is very close to the surface. Such areas are extensive in the western part of the Ecological Landscape, where soils may be poorly drained with surfaces of peat, muck or mucky peat. Thickness of peat deposits ranges from a few inches to more than 15 feet. Large areas of wetlands and a number of generally low-gradient streams that range from small coldwater streams to large warmwater rivers. Major rivers include the Wisconsin, Black, East Fork of the Black, Yellow, and Lemonweir. A number of headwaters streams originate in the extensive peatlands west of the Wisconsin River. Natural lakes are rare, and are limited to riverine floodplains and a few scattered ponds within the bed of extinct Glacial Lake Wisconsin. The hydrology of this Ecological Landscape has been greatly disrupted by past drainage, channelization, impoundment construction, and groundwater withdrawal. The eastern portion of the Central Sand Plains is a mosaic of cropland, managed grasslands and scattered woodlots of pine, oak, and aspen. Many of the historic wetlands in the east were drained early in the 1900s and are now used for agricultural purposes. The western portion of this Ecological Landscape is mostly forest or wetland. Oak, pine, and aspen are the most abundant forest cover types. Plantations of red pine are common in some areas. On wet sites the forests are of two major types: tamarack and black spruce in the peatlands, and bottomland hardwoods in the floodplains of the larger rivers. Many attempts to practice agriculture west of the Wisconsin River failed due to poor soils, poor drainage, and growing season frosts. Population is estimated at 292,119, comprising 5.1% of the state total resulting in a population density of approximately 46 persons/ sq. mile. Approximately one-quarter of the Ecological Landscape is publicly owned, very high for an Ecological Landscape this far south.

**Forest Transition** – Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the "Tension Zone") that runs southeast-northwest across the state. The mean growing season is 133 days, mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The growing season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. The Forest Transition was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Most soils are non-calcareous, moderately well-drained sandy loams derived from glacial till, but there is considerable diversity in the range of soil attributes. The area includes sandy soils formed in outwash, as well as organic soils, and loam and silt loam soils on moraines. There are many areas with shallow soils.

Drainage classes range from poorly drained to excessively drained. Density of the till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition. Soils throughout the Ecological Landscape have silt loam surface deposits formed in aeolian loess, about 6 to 24 inches thick in much of the area. Major river systems draining this Ecological Landscape include the Wolf, Wisconsin, Black, Chippewa, and St. Croix. Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the Ecological Landscape remains heavily forested, the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared), and the west end is a mixture of forest, lakes, and agricultural land. Population is estimated at 639,625, comprising 11.4% of the state total resulting in a population density of approximately 49 persons/ sq. mile. About 88% of all forested land is privately-owned while 12% belongs to the state, counties or municipalities.

**North Central Forest** – Typical of northern Wisconsin, mean growing season in the North Central Forest is 115 days, the shortest growing season of all Ecological Landscapes in the state. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean annual snowfall is 63 inches. However, heavier snowfall can occur closer to Lake Superior, especially in the northwestern part of the Ecological Landscape in the topographically higher Penoque-Gogebic Iron Range. The cool temperatures and short growing season are not conducive to supporting agricultural row crops such as corn in most parts of the Ecological Landscape. Only six percent of the North Central Forest is in agricultural use. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penoque-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands. Rivers, streams, and springs are common and found throughout this Ecological Landscape. Major rivers include the Wisconsin, Chippewa, Flambeau, Jump, Wolf, Pine, Popple, and Peshtigo. Large lakes include Namekagon, Courte Oreilles, Owen, Round, Butternut, North Twin, Metonga, Pelican, Pine, Kentuck, Pickerel, and Lucerne. Several large man-made flowages occur here such as the Chippewa, Turtle-Flambeau, Gile, Pine, and Mondeaux. There are several localized but significant concentrations of glacial kettle lakes associated with end and recessional moraines (e.g., the Perkinstown, Bloomer, Winegar, Birchwood Lakes, and Valhalla/Marenisco Moraines.) In southern Ashland and Bayfield counties, the concentrations of lakes are associated with till plains or outwash over till. Lakes here are due to dense till holding up the water table. Rare lake types in the North Central Forest include marl and meromictic lakes. Forests cover approximately 75% of this Ecological Landscape. The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern

white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack), non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marsh (including wild rice marshes) are widespread in the North Central Forest. Population is estimated at 244,782, comprising 4.4% of the state total resulting in a population density of approximately 19 persons/ sq. mile. Forty-two percent is publicly owned, mostly by federal, state or county governments.

**Northern Highland** – Typical of northern Wisconsin, with a mean growing season of 122 days. The mean annual temperature is 39.5 deg. F, the lowest of any Ecological Landscape in the state and almost 2 degrees lower than other northern ecological landscapes. The mean annual precipitation is 31.6 inches, similar to other northern ecological landscapes. The mean annual snowfall is 68.1 inches, the second largest amount of snowfall in the state. Only the Superior Coastal Plain receives more snowfall (87.4 inches). Snowfall varies dramatically within the Northern Highland, with the northern part of the Ecological Landscape being within the outer edge of the lake effect "snowbelt" of Upper Michigan and northwestern Wisconsin. The cool temperatures, short growing season, and sandy soils are not adequate to support agricultural row crops, such as corn. Only about one percent of the Northern Highland is used for agricultural purposes. The climate is favorable for forests, which cover more than 76% of the Ecological Landscape. Most of the Ecological Landscape is an undulating, gently rolling glacial outwash plain with many kettle lakes, wetlands, and bogs. Remnant moraines and drumlins occur often, with their lower slopes covered with outwash sands. Most soils are sands and gravels, some with a loamy mantle. Soil productivity is low compared to glacial till but relatively high for outwash sands. Wetlands are numerous; most have organic soils of peat or muck. There is a globally significant concentration of glacial lakes in the Northern Highland: 4,291 lakes; 1,543 miles of streams, including the headwaters of the Wisconsin and Manitowish-Flambeau-Chippewa river systems. Many lakes are connected by small streams. Rare aquatic species and extensive wetlands (see below) occur here. 48% upland forest, 34% wetlands (both forested and non-forested), 13% open water, 5% grassland and open land, and 1% urban. Population is estimated at 65,660, comprising 1.2% of the state total resulting in a population density of approximately 23 persons/ sq. mile. Thirty percent of the land area and forty-three percent of the forestland in the Ecological Landscape is in public ownership.

**Northwest Sands** – Mean annual temperature (41.30 F) is similar to other northern Ecological Landscapes. Annual precipitation averages 31.4 inches and annual snowfall about 61 inches, also similar to other northern Ecological Landscapes. The growing season is short and averages 121 days. Although there is adequate rainfall to support agricultural row crops such as corn, the sandy soil and short growing season limit row crop agriculture, especially in the northern part of the Ecological Landscape. This Ecological Landscape is the most extensive and continuous xeric glacial outwash system in northern Wisconsin. It has two major geomorphic components. One is a large outwash plain pitted with depressions, or "kettle lakes." The other component is a former spillway of Glacial Lake Duluth (which preceded Lake Superior) and its associated terraces. The spillway is now a river valley occupied by the St. Croix and Bois Brule Rivers. The hills in the northeast are formed primarily of sand, deposited as ice-contact fans at the outlet of subglacial tunnels. Lacustrine deposits (especially fine materials of low permeability such as clays) from Glacial Lake Grantsburg underlie Crex Meadows and Fish Lake Wildlife Areas, and are responsible for impeding drainage, leading to the formation of the large wetlands there.

Upland soils are typically sands or loamy sands over deeper-lying strata of sand, or sand mixed with gravel. These soils drain rapidly, leading to xeric, droughty conditions within the Ecological Landscape. Wetlands in low-lying depressions have organic soils of peat or muck. This Ecological Landscape has significant concentrations of glacial kettle lakes, most of them seepage lakes, a well-developed pattern of drainage lakes, and several large wetland complexes. The lakes cover roughly 4.8% of the area of the Northwest Sands, the third highest percentage among ecological landscapes in Wisconsin. The headwaters of the St. Croix and Bois Brule rivers are here. Major rivers include the St. Croix, Namekagon, Yellow, and Totagatic. Springs and seepages are common along the Upper Bois Brule but local elsewhere. Landcover is a mix of dry forest, barrens, grassland, and agriculture, with wetlands occupying significant parts of the bed of extinct Glacial Lake Grantsburg, kettle depressions, and some river valleys. Within the forested portion, pine, aspen-birch, and oak are roughly equally dominant. The maple-basswood, spruce-fir, and bottomland hardwood forest types occupy small percentages of the Ecological Landscape's forests. The open lands include a large proportion of grassland and shrubland. Emergent/wet meadow and open water are significant in the southern part of the Northwest Sands. There is very little row-crop agriculture. Population is estimated at 90,010, comprising 1.6% of the state total resulting in a population density of approximately 20 persons/ sq. mile. Forty-eight percent of the land and water in this landscape is in public ownership.

**Western Coulee & Ridges** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 43 inches. Because it extends over a considerable latitudinal area, the climate varies from north to south. The climate is favorable for agriculture, but steep slopes limit intensive agricultural uses to broad ridgetops and parts of valleys above floodplains. The climate variability, along with the rugged ridge and coulee (valley) topography, numerous microhabitats, and large rivers with broad, complex floodplains, allows for a high diversity of plants and animals. Characterized by its highly eroded, unglaciated topography with steep sided valleys and ridges, high gradient headwaters streams, and large rivers with extensive, complex floodplains and terraces. Ancient sand dunes occur on some of the broader terraces along the Mississippi and Wisconsin rivers. Windblown loess of varying thickness; alluvium in the floodplains. Organic soils, especially peats, are rare. Dendritic drainage patterns are well-developed in this mostly unglaciated Ecological Landscape. Natural lakes are restricted to the floodplains of large rivers. Large warmwater rivers are especially important here, and include the Wisconsin, Chippewa, and Black. The Mississippi River forms the Ecological Landscape's western boundary. Numerous spring-fed (coldwater) headwaters streams occur here. Coolwater streams are also common. Current vegetation is a mix of forest (41%), agriculture (36%), and grassland (14%) with wetlands (5%) mostly in the river valleys. Primary forest cover is oak-hickory (51%). Maple-basswood forests (28%), dominated by sugar maple, basswood and red maple, are common in areas that were not burned frequently. Bottomland hardwoods (10%) dominated by silver maple, swamp white oak, river birch, ashes, elms, and cottonwood are common within the floodplains of the larger rivers. Relict "northern" mesic conifer forests composed of hemlock, white pine and associated hardwoods such as yellow birch are rare but do occur in areas with cool, moist microclimates. Dry rocky bluffs may support xeric stands of native white pine, sometimes mixed with red or even jack pine. Prairies are now restricted to steep south- or west-facing bluffs, unplowed outwash terraces along the large rivers, and a few other sites. They occupy far

less than 1% of the current landscape. Mesic tallgrass prairies are now virtually nonexistent except as very small remnants along rights-of-way or in cemeteries. Population is estimated at 614,553, comprising 10.8% of the state total resulting in a population density of approximately 54 persons/ sq. mile. Public ownership in this Ecological Landscape is limited (only about 3%) and much of it is associated with the large rivers (i.e. Mississippi, Wisconsin, Chippewa and Black rivers).

**Western Prairie** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.1, and mean annual snowfall is 45.4 inches. The climate and topography was favorable to frequent fires that resulted in prairie vegetation occurring in almost a third of the area prior to Euro-American times. The length of the growing season, adequate precipitation, and favorable temperatures make the climate favorable for agriculture, which is prevalent here. The Landscape is entirely glaciated. Major landforms are rolling till plain, with end moraine in the northwest and small areas of outwash. Soils are predominantly formed in loamy till glacial deposits, while some are in outwash. A loess cap of aeolian silt is 6 to 48 inches thick over the surface. The dominant soil is well drained and loamy with a silt loam surface, moderate permeability, and moderate available water capacity. The Lower St. Croix River forms the western boundary of this Ecological Landscape (however, note that this Ecological Landscape is part of a larger ecological region, Subsection 222 Md, which extends west into Minnesota). Other important though much smaller rivers include the Apple, Kinnickinnic, and Willow. Most of the rivers drain westward to the St. Croix, with several draining south directly into the Mississippi, and a few flowing southeast to the Chippewa. Inland lakes, mostly seepage lakes and ponds, are most common in the northwestern part of the Landscape, in an area known informally as Wisconsin's "Prairie Pothole Region". There are multiple dams on the Willow River, and the Kinnickinnic has been dammed at River Falls. Many wetlands have been lost or severely altered by agricultural activities, which have been widespread and intensive in this productive Landscape. Almost half of the current land cover is agricultural crops and about one third of the area is grasslands, with smaller amounts of forest, open water, open wetlands, and urban areas. The major forest types are maple-basswood and oak-hickory, with lesser amounts of lowland hardwoods. Native coniferous forests are rare, and are limited to a few tamarack swamps and small scattered stands of pine on steep rocky slopes. Population is estimated at 120,708, comprising 2.2% of the state total resulting in a population density of approximately 77 persons/ sq. mile. Only three percent of the Western Prairie is in public ownership, much of it associated with the St. Croix, Kinnickinnic, and Willow rivers.

This Service area can be further broken down into seven smaller HUC-8 watersheds, the Lower Chippewa (07050005), Red Cedar River (07050007), Eau Claire River (07050006), Jump River (07050004), Upper Chippewa River (07050001), South Fork Flambeau River (07050003) and the Flambeau River (07050002). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

## **Element II. Threats:**

Overall wetland resource threats within this service area include water quality in the upper northeastern and southwestern portions resulting in 303d listed impaired waters, invasive species brought in through high recreational usage, fragmentation of corridors, high utilization of groundwater in the southeastern portions and land use changes. The north central portions of this service area (Northern Highland **WDNR 2012**) have seen a steady increase of both seasonal and permanent residents resulting in overall urbanization and its anthropomorphic effects. Impacts are evident along shorelines where habitat loss has occurred in littoral and riparian zones. Population growth and associated development in forested areas also further threatening ecosystem connectivity, spawning areas and overall habitat quality. Invasive species are present in both terrestrial and aquatic ecosystems in a quantity where control measures pose a higher likelihood of success being not completely overrun. The major consideration within the northern and central section of this service area (North Central Forests **WDNR 2012**) is clarification of the roles played by and ecological relationships among public, private, industrial, and tribal lands from a conservation, socioeconomic, and recreational perspectives. In recent years there has been documentation of widespread negative impacts to forests from: excessive deer browse; invasive earthworms, insects, plants and pathogens; divestitures of large private holdings (especially estates and industrial forests); increased parcelization; and the development of shoreline habitats. Other important threats to consider include: the potential implications of climate change; ecological impacts of increased biomass harvest; forest type conversions; forest simplification and homogenization; and fragmentation. The central band running west to east across this service area (Forest Transition **WDNR 2012**) is located north of the Tension Zone and is quite heterogeneous. This central area has lost over half of its historic forests (though this is highly variable in different areas), and overall, is one of the most deforested landscapes north of the Tension Zone. This area is a mosaic of agricultural land, forest, and recreational lands being highly fragmented, limiting most large-scale management opportunities. Large power dams occur on several of the major rivers, including the Chippewa. The southeastern tip of this service area (Central Sand Plains **WDNR 2012**) may contain a large amount of forest cover and wetlands, presenting a unique opportunity for management at larger scales. Groundwater withdrawals and contamination are concerns due to the high productivity and infiltration rates of its sandy soils and high water tables. Invasive species is again a threat as with most areas of the state. The southwestern corner of this service area (Western Prairie **WDNR 2012**) suffers from agriculture as the dominant land use, with residential development increasing. The remaining southern areas (Western Coulee and Ridges **WDNR 2012**) contain some of the highest urbanized regions of this service area with agriculture, residential and overall development having the greatest impact. As one reflection of this invasive species overrun the heaviest visited areas within this section. Dams exist throughout this area and results in fragmentation aquatic habitats, while alternatively free-flowing areas still exist for stretches of the Chippewa River. Groundwater withdrawals in the southern portions also pose a threat.

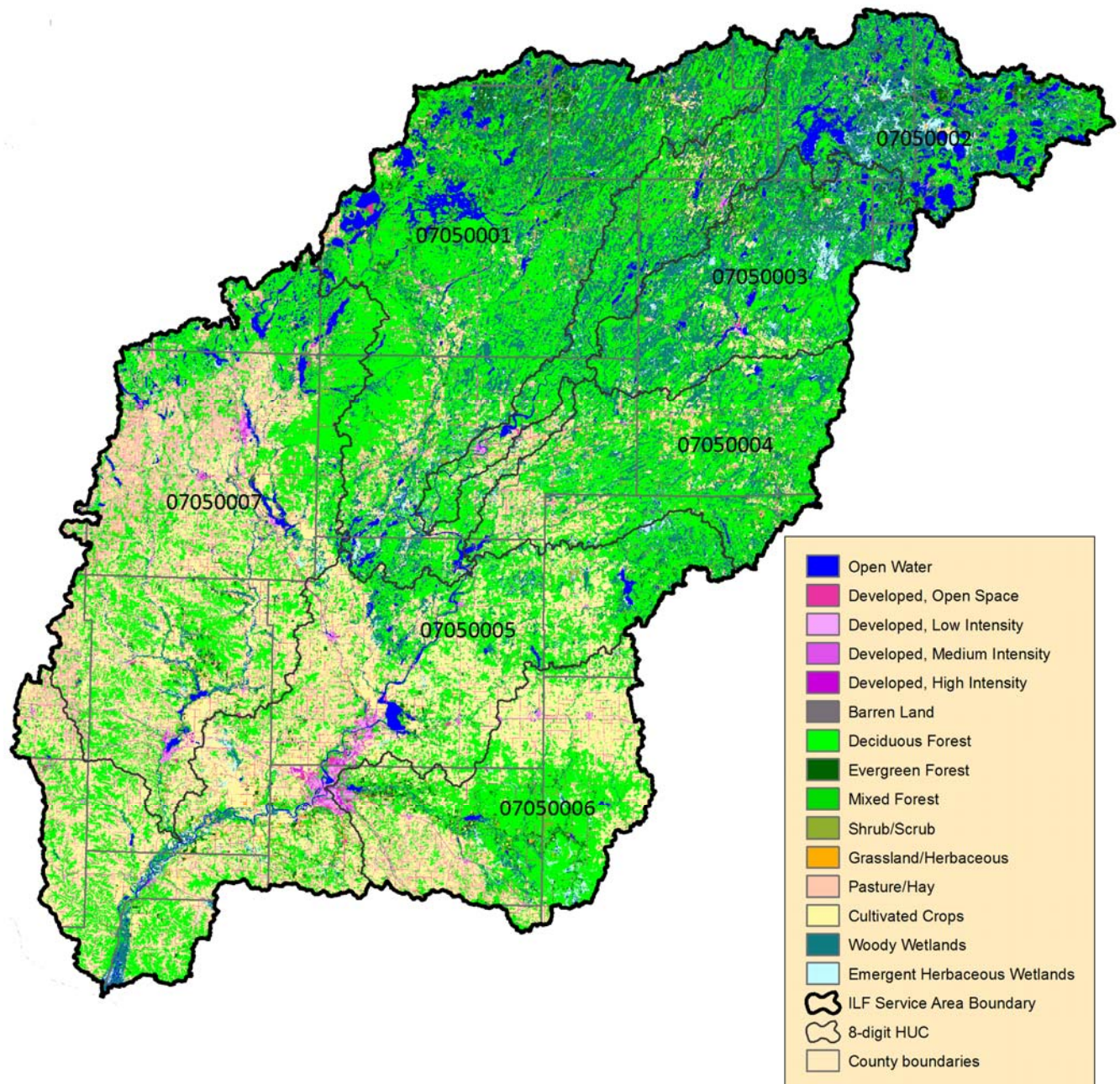
The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed

and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average

#### Current Land Use:

#### Land Use (NLCD 2006) per HUC-8

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Land Use Threats (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07050005 - Lower Chippewa River	1,276,381	43,382	608,618	624,381	3.40%	47.68%	48.92%
07050007 - Red Cedar River	1,166,814	29,397	550,047	587,370	2.52%	47.14%	50.34%
07050006 - Eau Claire River	545,650	12,435	231,357	301,858	2.28%	42.40%	55.32%
07050004 - Jump River	546,452	18,529	81,135	446,787	3.39%	14.85%	81.76%
07050001 - Upper Chippewa River	1,276,884	84,713	89,893	1,102,278	6.63%	7.04%	86.33%
07050003 - South Fork Flambeau River	492,464	32,056	22,483	437,925	6.51%	4.57%	88.93%
07050002 - Flambeau River	795,998	72,390	22,821	700,787	9.09%	2.87%	88.04%

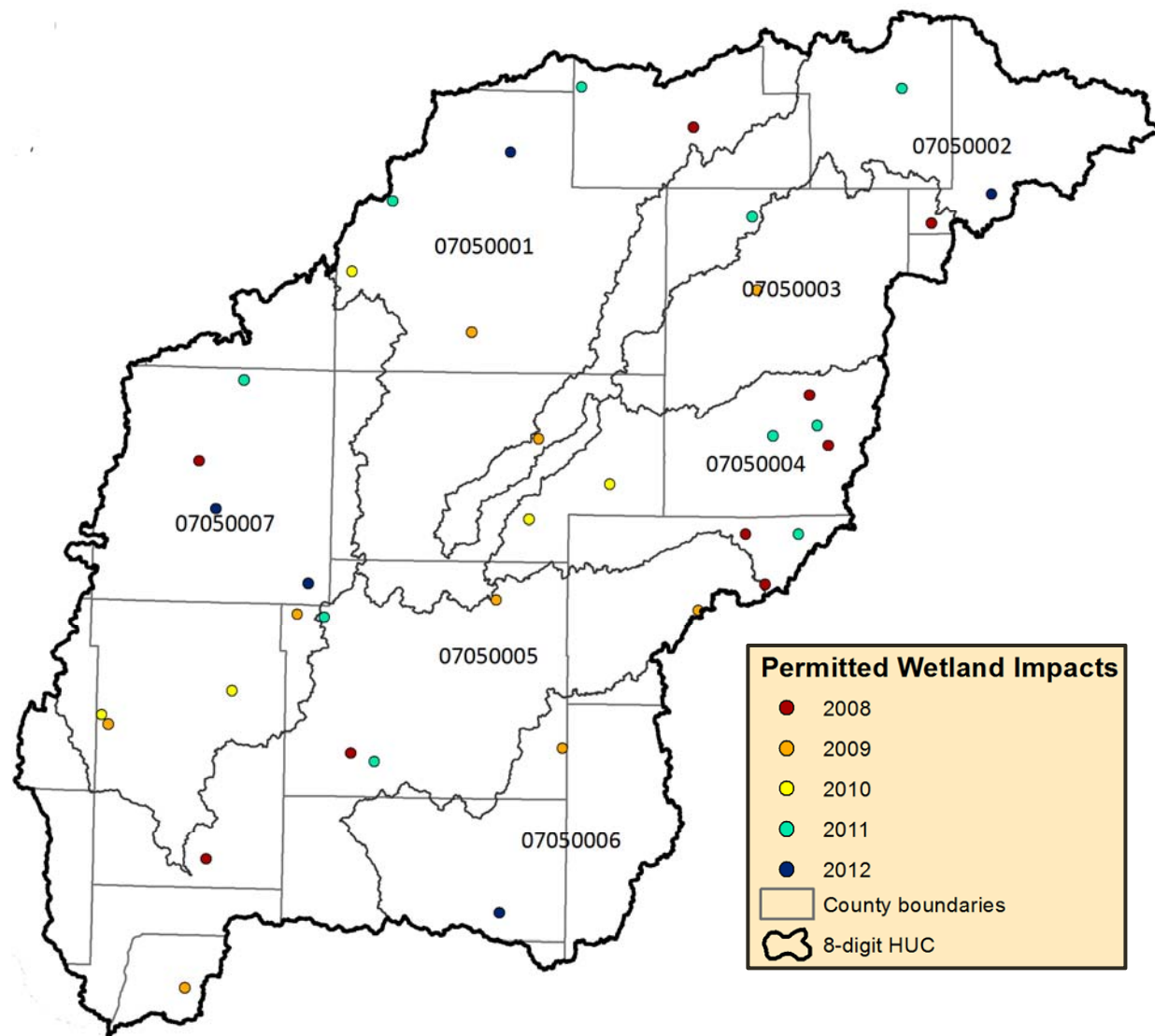
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Lower Chippewa River HUC-07050005, Red Cedar River HUC-07050007 and Eau Claire River HUC-07050006 have the least amount of natural land use remaining along with the greatest threat from agriculture activities.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07050007 - Red Cedar River	5%	0%	62%	17%	15%	1%	5,416
07050004 - Jump River	32%	0%	0%	0%	63%	5%	4,591
07050002 - Flambeau River	0%	74%	15%	0%	10%	2%	2,721
07050001 - Upper Chippewa River	11%	27%	13%	3%	46%	0%	2,631
07050006 - Eau Claire River	22%	0%	78%	0%	0%	0%	2,071
07050005 - Lower Chippewa River	20%	0%	73%	7%	0%	0%	1,292
07050003 - South Fork Flambeau River	0%	0%	50%	50%	0%	0%	0.022

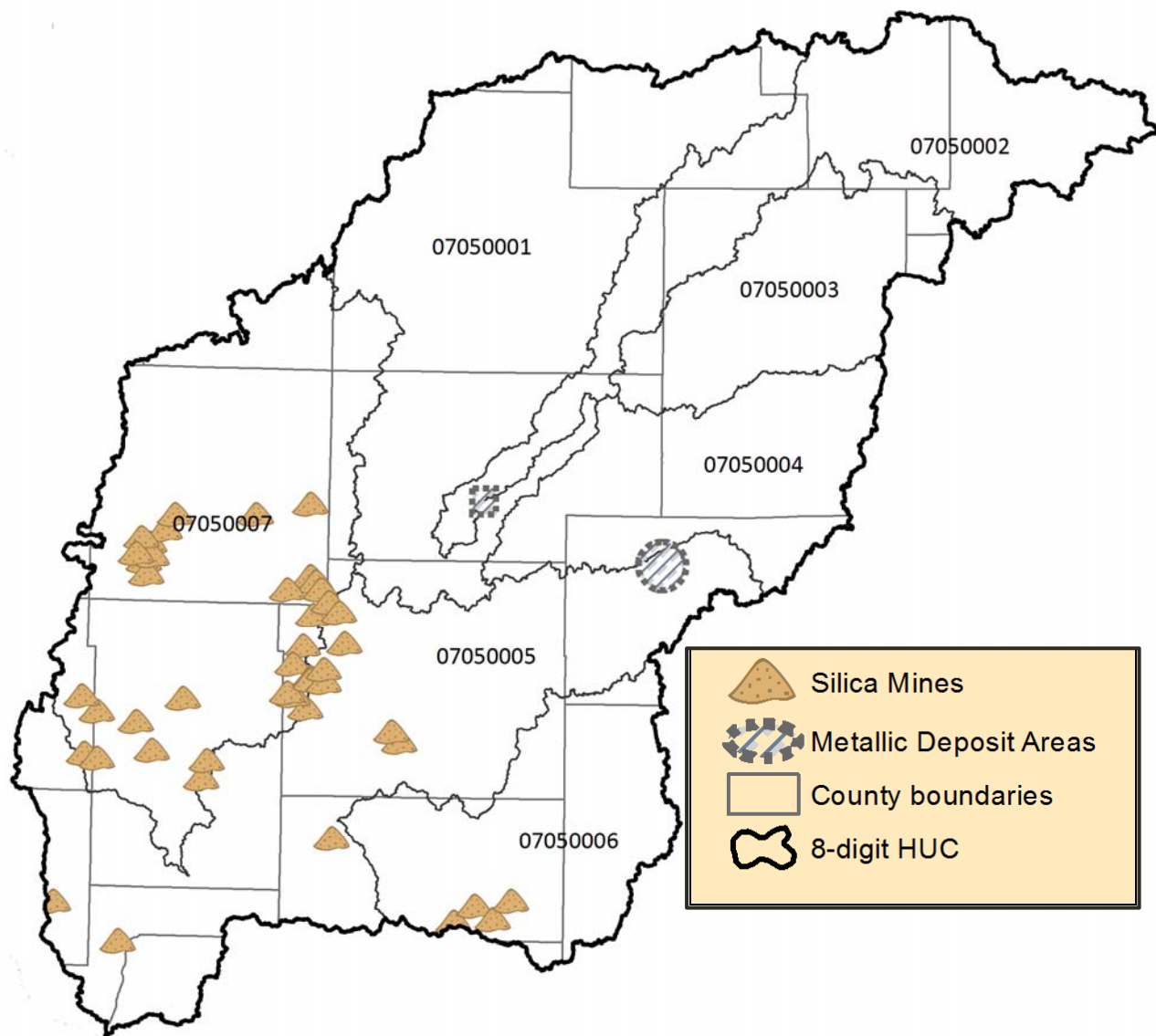
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

While the Chippewa SA does not contain any current metallic exploration areas it does intersect with portions of non-metallic mining zones as depicted in the below map. These Frac Sand mines and processing facilities fall within the Red Cedar River HUC-07050007, Eau Claire River HUC-07050006 and Lower Chippewa River HUC-07050005 thus presenting an increased future threat within these watersheds giving greater priority to these HUC-8's.

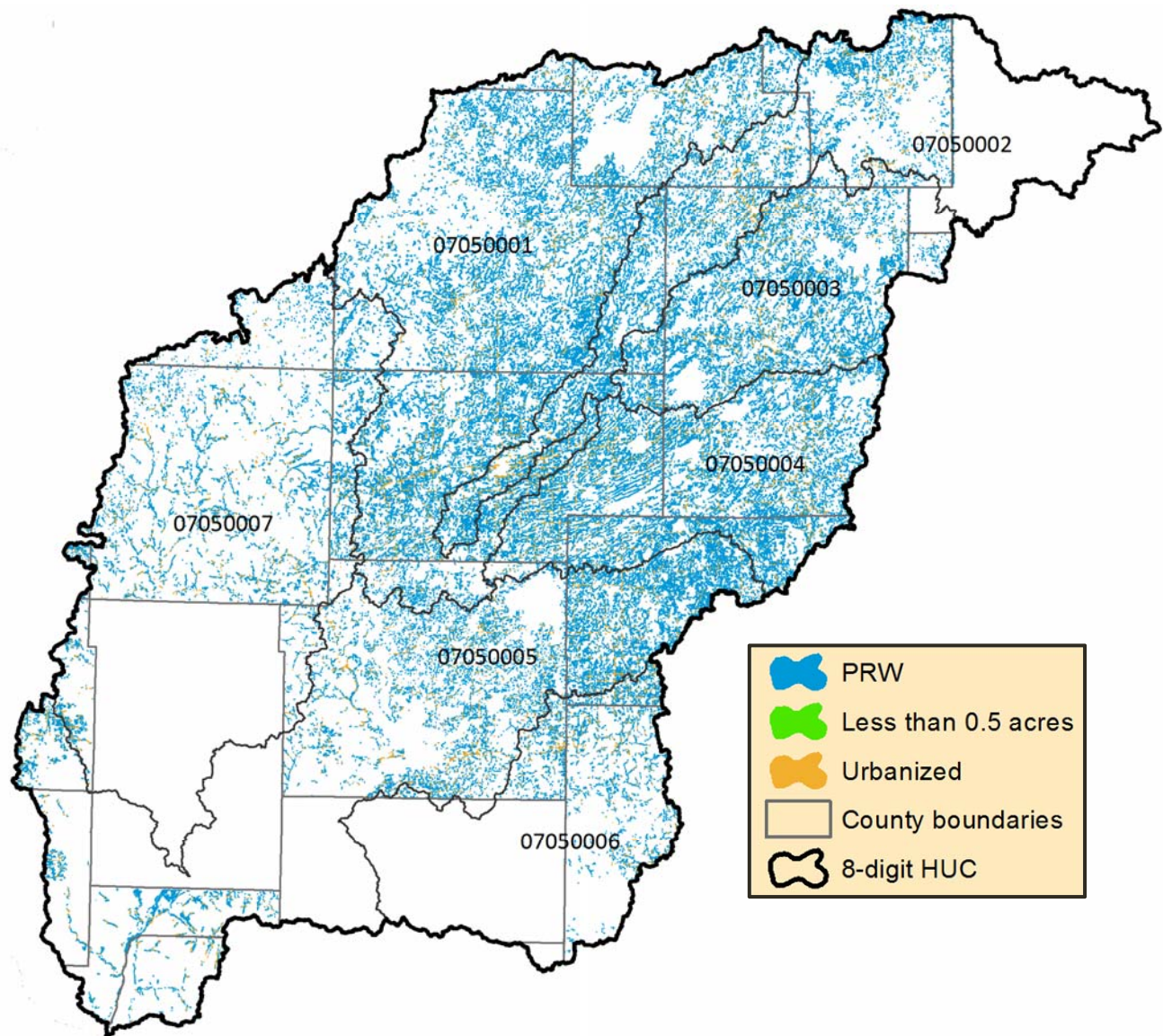
**Potential Mining Impacts per HUC-8 Watershed**

(black straight lines indicate County and/or State boundaries for reference)



**Element III. Historic Loss:**

This watershed has a history rooted in the timber industry with pulp and paper mills setting the stage for subsequent population growth and industrialization. The red clay soils of the lower watershed contributed to red bricks used to fabricate the structures of the areas, which in many cases remain in place today. As settlement grew in response to the growing economy trails were cut followed by roadways and the ever expanding effects of anthropogenic influence (**WDNR Basin Website 2013**). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)

**Overall Estimated Historic Wetland Percent Loss Summary**

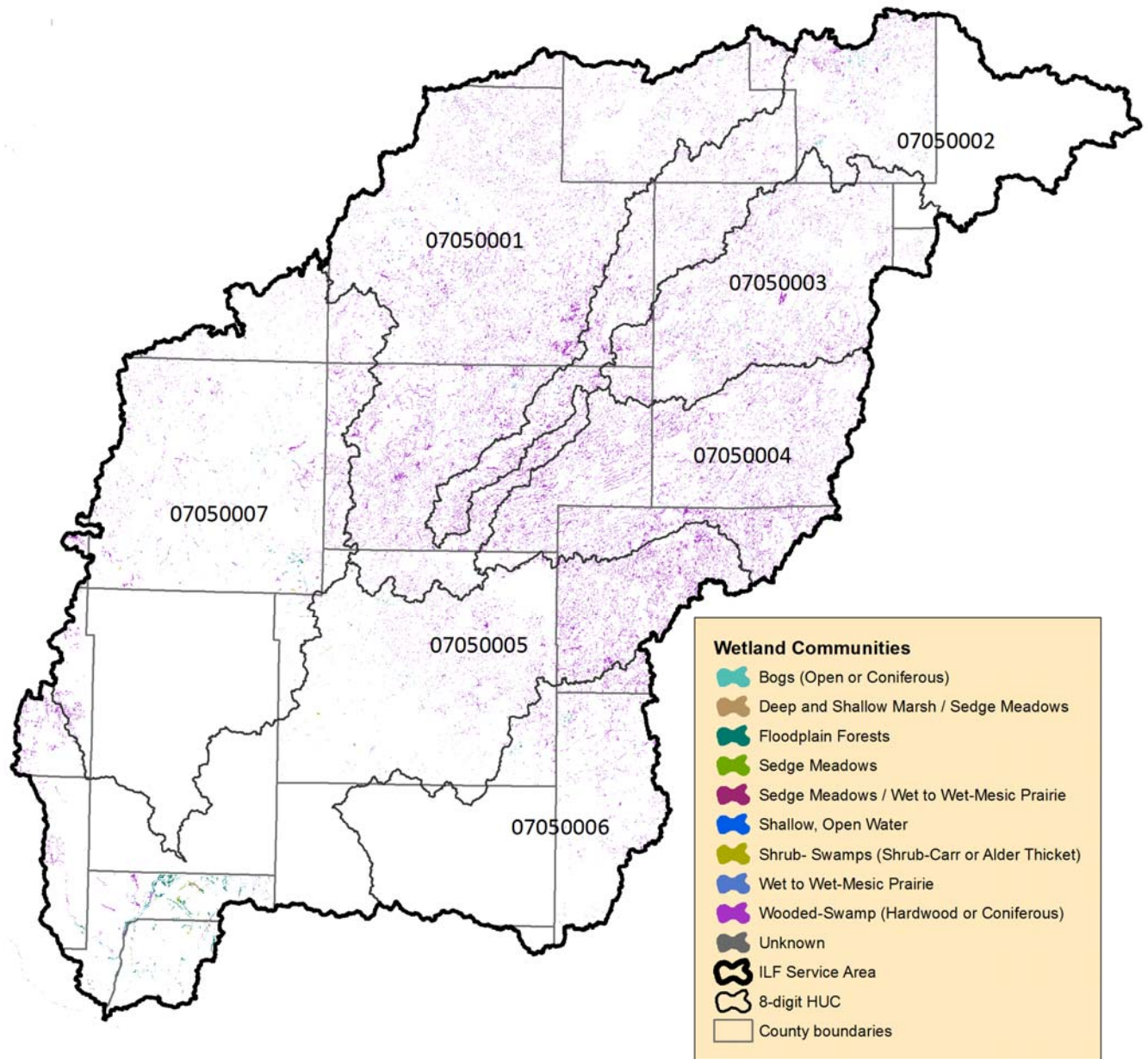
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
07050004 - Jump River	38,735	21.63%
07050005 - Lower Chippewa River	39,940	21.44%
07050007 - Red Cedar River	18,058	19.86%
07050001 - Upper Chippewa River	58,232	16.82%
07050002 - Flambeau River	24,238	15.13%
07050003 - South Fork Flambeau River	21,647	13.94%
07050006 - Eau Claire River	8,359	12.03%

The map and table above identify that the Jump River HUC-07050004, Lower Chippewa River HUC-07050005 and Red Cedar River HUC-07050007 have sustained the greatest loss of wetlands. However, it should be noted that Dunn county, Vilas county and Eau Claire county do not currently have digitally available WWI or PRW data, which effects major portions of the Red Cedar River HUC-07050007, Lower Chippewa River HUC-07050005, Flambeau River HUC-07050002 and Eau Claire River HUC-07050006. Therefore, when establishing the priority HUC-8 watershed to target for mitigation projects greater weight was placed upon the other threats factors such as land use, permit trends and future threats.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or Coniferous)
07050004 - Jump River	9.92%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	13.40%	#DIV/0!	#DIV/0!	#DIV/0!	23.51%
07050005 - Lower Chippewa River	3.05%	32.99%	16.59%	29.01%	19.58%	22.65%	12.92%	#DIV/0!	8.77%	21.27%
07050007 - Red Cedar River	13.24%	2.68%	12.84%	25.66%	31.41%	9.38%	13.80%	#DIV/0!	0.21%	20.21%
07050001 - Upper Chippewa River	4.83%	#DIV/0!	22.89%	#DIV/0!	#DIV/0!	22.24%	#DIV/0!	#DIV/0!	#DIV/0!	18.87%
07050002 - Flambeau River	7.19%	#DIV/0!	#DIV/0!	0.93%	#DIV/0!	19.34%	#DIV/0!	#DIV/0!	#DIV/0!	15.44%
07050003 - South Fork Flambeau River	5.44%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	15.02%	#DIV/0!	#DIV/0!	#DIV/0!	13.53%
07050006 - Eau Claire River	0.00%	#DIV/0!	8.79%	#DIV/0!	#DIV/0!	7.54%	1.49%	#DIV/0!	#DIV/0!	11.39%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

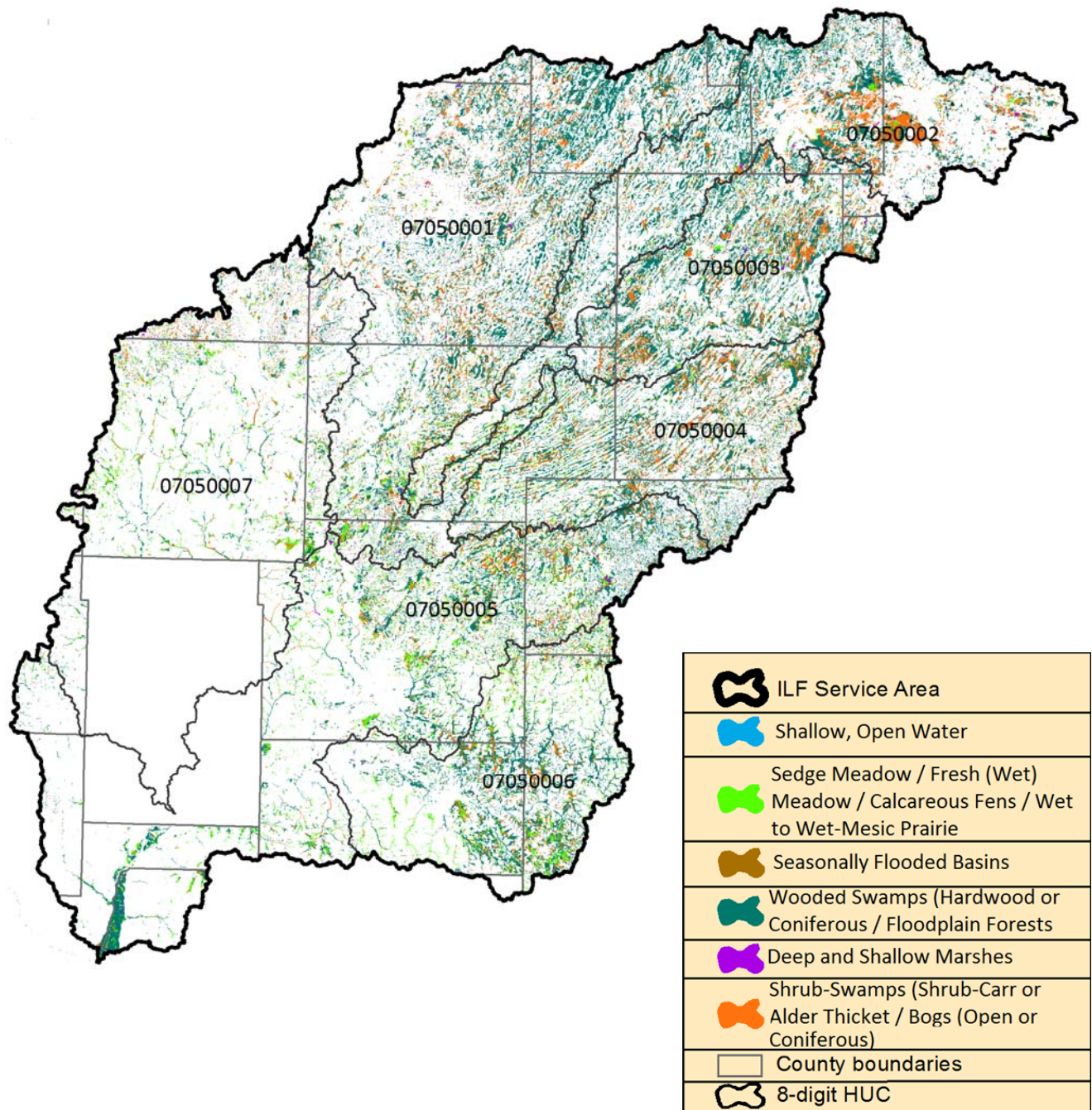
#### **Element IV. Current Conditions:**

The Chippewa Watershed Area consists of seven total HUC-8 watersheds such as the Upper (07050001) and Lower Chippewa Rivers (07050005) and comprises the largest Service area. The Upper Chippewa (07050001) is formed by the confluence of the West Fork Chippewa River (rising from Chippewa Lake) and the East Fork Chippewa River (rising from wetlands in the Town of Knight). The Lower Chippewa (07050005) downstream from Eau Claire (07050006) and downstream from Menomonie on the Red Cedar (07050007) contains more rare species (125) and more native prairie (25% of state total) than any area of comparable size in Wisconsin (**WDNR Basin Website 2013**). This area provides significant areas of habitat, recreation, navigation and is home to over 40 lakes that host Wild Rice stands, a critical natural resource protected by state and tribal (**WDNR Basin Website 2013**). The Chippewa Service area also provides a great sport fishery hosting musky, walleye and smallmouth bass in its many water resource areas. Hosting critical habitat for rare species this watershed area has been subject of many preservation activities through the various State Wildlife Areas and Natural Areas. Being the largest of our 12 Service areas this watershed contains a wide variety of resources and is subject to many diverse impacts. For examples, the Lower Chippewa (07050005) watershed is subject to groundwater threats by the extensive network of high capacity wells, whereas the Upper Chippewa (07050001) has relatively few high capacity wells (**Figure 6**).

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07050001 - Upper Chippewa River	1,385.56	20,236.59	9.91	218,483.15	4,796.24	79,930.08	324,850.33
07050005 - Lower Chippewa River	191.46	35,879.82	55.38	89,793.55	2,690.81	36,218.75	166,579.89
07050002 - Flambeau River	219.83	6,095.75	0.00	107,845.43	1,682.95	42,313.28	158,157.59
07050003 - South Fork Flambeau River	460.38	4,256.84	0.00	75,249.64	1,827.91	74,624.94	156,432.67
07050004 - Jump River	145.86	11,237.69	9.94	80,614.69	907.62	61,662.71	154,596.88
07050007 - Red Cedar River	1,839.84	24,169.75	6.37	34,905.00	3,507.34	19,510.01	83,966.12
07050006 - Eau Claire River	0.00	16,963.96	0.00	39,020.25	382.34	14,668.35	71,111.02

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07050001 - Upper Chippewa River	0.43%	6.23%	0.00%	67.26%	1.48%	24.61%	100.00%
07050005 - Lower Chippewa River	0.11%	21.54%	0.03%	53.90%	1.62%	21.74%	100.00%
07050002 - Flambeau River	0.14%	3.85%	0.00%	68.19%	1.06%	26.75%	100.00%
07050003 - South Fork Flambeau River	0.29%	2.72%	0.00%	48.10%	1.17%	47.70%	100.00%
07050004 - Jump River	0.09%	7.27%	0.01%	52.15%	0.59%	39.89%	100.00%
07050007 - Red Cedar River	2.19%	28.79%	0.01%	41.57%	4.18%	23.24%	100.00%
07050006 - Eau Claire River	0.00%	23.86%	0.00%	54.87%	0.54%	20.63%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.

6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.
8. Restore, enhance, establish and/or preserve 10 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Red Cedar River****HUC – 07050007**

This watershed has lost approximately 19.86% of its overall historic wetlands, which is amongst the highest for this service area. Corps permitted actions over the past 5 years depict 5.416 acres of wetland loss, which represent the highest known losses within this overall service area. Sedge Meadows and Wet to Wet-Mesic Prairie sustained the greatest percent of historic losses, followed by Wooded Swamps with all having significant acreage losses. It should be noted that Bogs have also sustained high losses both in percentage and overall acreage. Permit trends show the greatest impact trends with Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairie, Wooded Swamps and Floodplain Forests. The overall land use within this watershed is largely split between natural categories at 50.34% followed closely by agriculture at 47.14%. The natural land use area is comprised of mainly deciduous forest, woody wetlands, open water and emergent herbaceous wetlands, while the agriculture is comprised of cultivated crops and pasture/hay areas. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows and Wet to Wet-Mesic Prairie. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) will fit well within this watershed given the overall forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadows, Southern Sedge Meadows, Floodplain Forest, White Pine-Red Maple, Ephemeral Pond, Calcareous Fen and Bogs (Coniferous or Open).

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies, Floodplain Forests and Wooded Swamps (Hardwood or Coniferous).
- Preserve Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadows, Southern Sedge Meadows, Floodplain Forest, White Pine-Red Maple, Ephemeral Pond, Calcareous Fen and Bogs (Coniferous or Open).

**Lower Chippewa River****HUC – 07050005**

This watershed has lost approximately 21.44% of its overall historic wetlands, which is the second highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years

depict 1.292 acres of wetland loss, which represent one of the lowest known losses within this overall service area. Deep and Shallow Marshes (32.99%), Sedge Meadows (29.01%), Shallow Open Water (22.65%) and Wooded Swamps (21.27%) have sustained the greatest percent of historic losses as noted. Permit trends show the greatest impact trends with Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairie and Calcareous Fens. The overall land use within this watershed is largely spit between natural categories at 48.92% followed closely by agriculture at 47.68%. The natural land use area is comprised of mainly deciduous forest, woody wetlands and emergent herbaceous wetlands, while the agriculture is comprised of mainly cultivated crops. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairie and Calcareous Fens. Therefore, replacing Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows and Wooded Swamps will fit well within this watershed given the overall forested and emergent herbaceous wetlands land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Boreal Rich Fen, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Ephemeral Pond, Calcareous Fen, Bog (Coniferous or Open).

- Restore and enhance Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows and Wooded Swamps (Hardwood or Coniferous).
- Preserve Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Boreal Rich Fen, Northern Sedge Meadow, Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Ephemeral Pond, Calcareous Fen, Bog (Coniferous or Open).

### **Jump River**

#### **HUC – 07050004**

This watershed has lost approximately 21.63% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 4.591 acres of wetland loss, which represent the second highest known losses within this overall service area. Wooded Swamps, Shallow Open Water and Bogs have sustained the greatest percent of historic losses at 23.51%, 13.40% and 9.92% respectively with Wooded-Swamps having the most significant acreage losses. Permit trends show the greatest impact trends with Wooded Swamps and Shrub Swamps. The overall land use within this watershed remains largely natural (81.76%) followed by agriculture at only 14.85%. The natural land use area is comprised of mainly deciduous forest, woody wetlands and mixed forest, while the agriculture is comprised of mainly cultivated crops. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Wooded Swamps and Shrub Swamps will fit well within this watershed given the overall forested land use and compatible mapped wetland community dominant types. Forested and Shrub vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bogs (Coniferous or Open).

- Restore and enhance Wooded Swamps (Hardwood or Coniferous) and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bogs (Coniferous or Open).

**Upper Chippewa River HUC – 07050001**

This watershed has lost approximately 16.82% of its overall historic wetlands, which is moderate for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 2.631 acres of wetland loss, which is again moderate for known losses within this overall service area. Floodplain Forests, Shallow Open Water and Wooded Swamps have sustained the greatest percent of historic losses at 22.89%, 22.24% and 18.87% respectively, followed by Bogs at 4.83% with all Wooded Swamps and Bogs leading the way in acreage losses. Permit trends show the greatest impact trends with Wooded Swamps consisting of nearly half (46%). The overall land use within this watershed is mainly natural at 86.33% with the remaining area split between agriculture at 7.04% and developed at 6.63%. The natural land use area is comprised of mainly deciduous forest, woody wetlands, mixed forest and open water, while the agriculture is comprised of pasture/hay and cultivated crops. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Shrub Swamps will fit well within this watershed given the overall forested land use and compatible mapped wetland community dominant types. Forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond, and Bogs (Coniferous or Open).

- Restore and enhance Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond, and Bogs (Coniferous or Open).

**Flambeau River HUC – 07050002**

This watershed has lost approximately 15.13% of its overall historic wetlands, which is moderate for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 2.721 acres of wetland loss, which represents again moderate known losses within this overall service area. Shallow Open Water and Wooded Swamps have sustained the greatest percent of historic losses at 19.34% and 15.44% respectively, followed by Bogs at 7.19% with all Wooded Swamps and Bogs having the most significant acreage losses. Permit trends show the greatest impact trends with Shallow Open Water at 74% followed by Deep and Shallow Marshes, Wooded Swamps and Floodplain Forests. The overall land use within this watershed remains largely natural at 88.04% followed by Developed at 9.09% and agriculture representing only 2.87%. The natural land use area is comprised of mainly deciduous forest, woody wetlands, open water and mixed forest. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Shrub Swamps and Bogs. Therefore, replacing Floodplain Forests and Wooded Swamps along with Shrub Swamps will fit well within this watershed given the overall forested landscape and compatible mapped wetland community dominant types. Forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bog (Coniferous or Open).

- Restore and enhance Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Shrub Swamps (Shrub-Carr or Alder Thicket).

- Preserve Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bog (Coniferous or Open).

**South Fork Flambeau River      HUC – 07050003**

This watershed has lost approximately 13.94% of its overall historic wetlands, which is relatively low for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 0.022 acres of wetland loss, which represent the lowest known losses within this overall service area. Shallow Open Water and Wooded Swamps have sustained the greatest percent of historic losses at 15.02% and 13.53% respectively, followed by Bogs at 5.44% with Wooded Swamps and Bogs having the most significant acreage losses. Permit trends show very minimal impact trend losses so depicting type losses is not meaningful. The overall land use within this watershed remains largely natural at 88.93% with the remaining developed at 6.51% and a small area of agriculture at 4.57%. The natural land use area is comprised of mainly deciduous forest, woody wetlands and mixed forest. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forest and Shrub Swamps. Therefore, replacing Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along Shrub Swamps will fit well within this watershed given the overall forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bogs (Coniferous or Open).

- Restore and enhance Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bogs (Coniferous or Open).

**Eau Claire River      HUC – 07050006**

This watershed has lost approximately 12.03% of its overall historic wetlands, which is the lowest for this service area. Corps permitted actions over the past 5 years depict 2.071 acres of wetland loss, which represent the highest known losses within this overall service area. Wooded Swamps have sustained the greatest percent of historic losses at 11.39%, followed by Floodplain Forests at 8.79% with both having significant acreage losses. Permit trends show the greatest impact trends with Deep and Shallow Marshes although overall are minimal. The overall land use within this watershed is largely split between natural categories at 55.32% followed closely by agriculture at 42.40% with a mere 2.28% developed. The natural land use area is comprised of mainly deciduous forest, woody wetland and emergent/herbaceous wetlands, while the agriculture is comprised of mainly cultivated crops. Current mapped wetlands are dominated Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, Wet to Wet-Mesic Prairie and Shrub Swamps. Therefore, replacing Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Sedge Meadows, Fresh (Wet) Meadows will fit well within this watershed given the overall forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Bog (Coniferous or Open).

- Restore and enhance Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) along with Sedge Meadows, Fresh (Wet) Meadows.
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Bog (Coniferous or Open).

**Existing Advanced Watershed Plans (AWP): None**

#### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

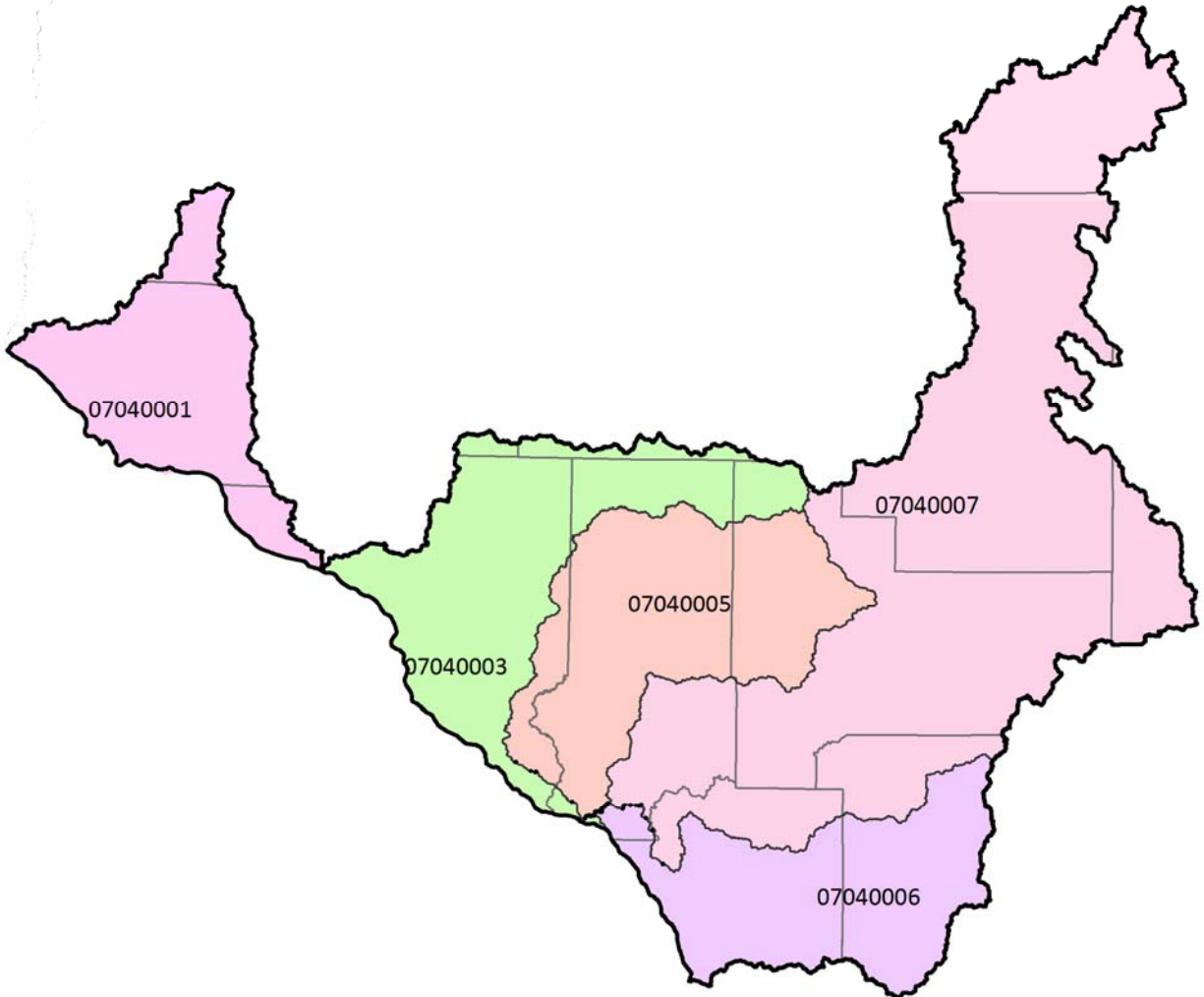
**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Upper Mississippi – Black Root CPF

### Element I. Service area:

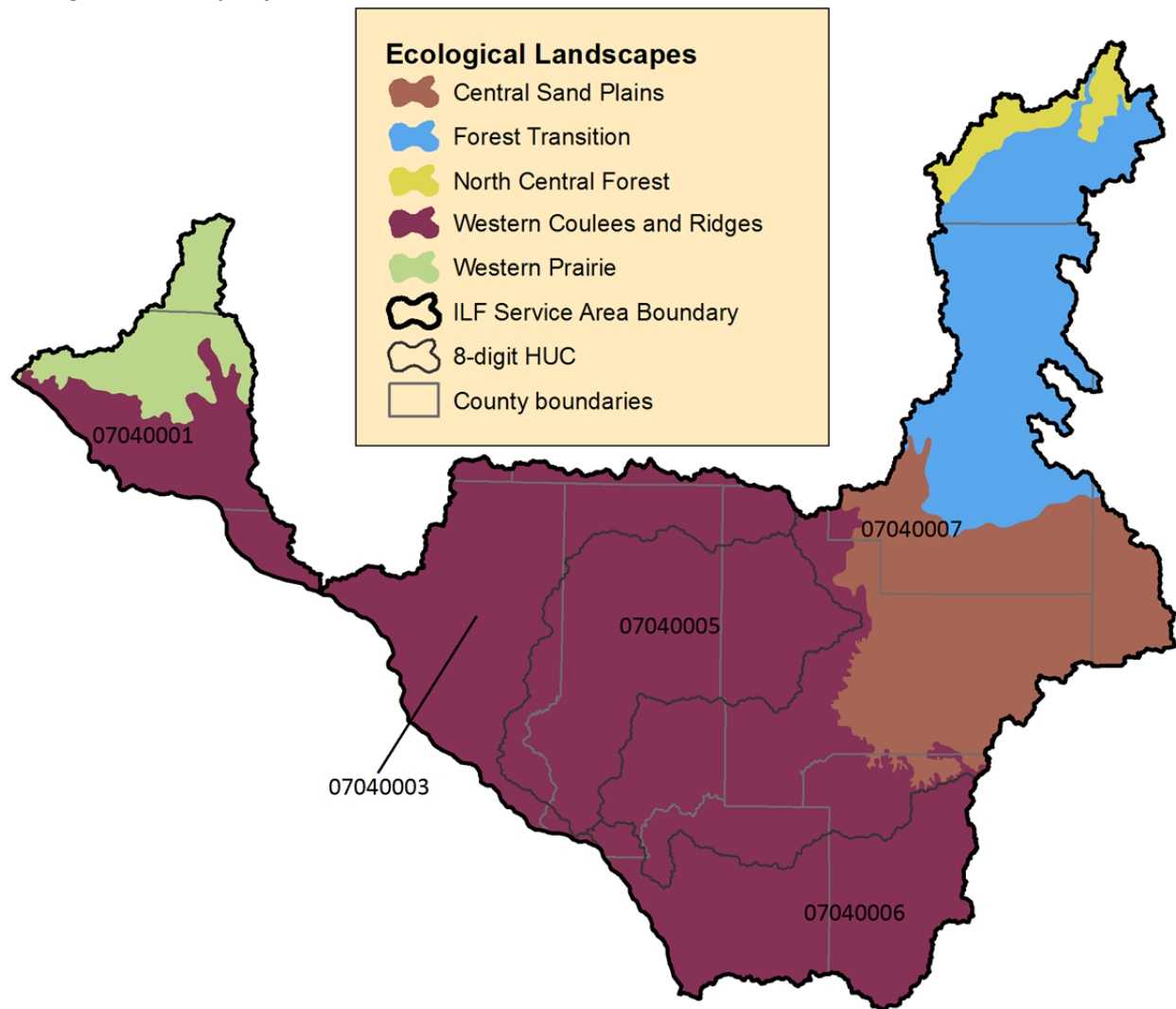
#### Overall SA Area with separate HUC-8 watersheds designated in color

(county & state boundaries shown in straight lines for further reference)



The Upper Mississippi – Black Root Service area is located on the western side of Wisconsin comprised of Saint Croix, Pierce, Pepin, Eau Claire, Buffalo, Trempealeau, La Crosse, Monroe, Jackson, Wood, Clark and Taylor counties and drains an area approximately 4,843 square miles.

Ecological Landscapes include (**WDNR 2012**):

**Ecological Landscapes per HUC-8**

**Central Sand Plains** – Typical of southern Wisconsin, mean annual temperature is 43.8 deg. F, mean annual precipitation is 32.8 inches, and mean annual snowfall is 45.0 inches. However, the mean growing season (135 days) is almost 19 days less than other southern Wisconsin ecological landscapes. Summer temperatures can drop below freezing at night in low-lying areas, restricting the distribution of some native plants. The short growing season and summer frosts limit agriculture, especially west of the Wisconsin River where commercially-grown cranberries are an important crop. East of the Wisconsin River the growing season is somewhat longer (by approximately 11 days), with fewer nights of potential summer frost. In this area agriculture is focused primarily on cool season crops such as potatoes, vegetables, and early maturing corn. Center pivot irrigation is widely used to water crops in this region of sandy soils. Grazing is a common land use practice in some areas. An extensive, nearly level expanse of lacustrine and outwash sand that originated from a huge glacial lake characterizes much of the Central Sand Plains. Sand was deposited in Glacial Lake Wisconsin by outwash derived from melting glaciers to the north. Exposures of eroded sandstone bedrock remnants as buttes, mounds and pinnacles are unique to this Ecological Landscape. Sandstone is also exposed as cliffs along the Black

River and some of its tributaries. Most soils formed from deep sand deposits of glacial lacustrine or outwash origin or in materials eroded from sandstone hillslopes and sometimes with a surface of wind-deposited (aeolian) sand. These soils are excessively drained, with very rapid permeability, very low available water capacity, and low nutrient status. In lower-lying terrain where silty lacustrine material impedes drainage, the water table is very close to the surface. Such areas are extensive in the western part of the Ecological Landscape, where soils may be poorly drained with surfaces of peat, muck or mucky peat. Thickness of peat deposits ranges from a few inches to more than 15 feet. Large areas of wetlands and a number of generally low-gradient streams that range from small coldwater streams to large warmwater rivers. Major rivers include the Wisconsin, Black, East Fork of the Black, Yellow, and Lemonweir. A number of headwaters streams originate in the extensive peatlands west of the Wisconsin River. Natural lakes are rare, and are limited to riverine floodplains and a few scattered ponds within the bed of extinct Glacial Lake Wisconsin. The hydrology of this Ecological Landscape has been greatly disrupted by past drainage, channelization, impoundment construction, and groundwater withdrawal. The eastern portion of the Central Sand Plains is a mosaic of cropland, managed grasslands and scattered woodlots of pine, oak, and aspen. Many of the historic wetlands in the east were drained early in the 1900s and are now used for agricultural purposes. The western portion of this Ecological Landscape is mostly forest or wetland. Oak, pine, and aspen are the most abundant forest cover types. Plantations of red pine are common in some areas. On wet sites the forests are of two major types: tamarack and black spruce in the peatlands, and bottomland hardwoods in the floodplains of the larger rivers. Many attempts to practice agriculture west of the Wisconsin River failed due to poor soils, poor drainage, and growing season frosts. Population is estimated at 292,119, comprising 5.1% of the state total resulting in a population density of approximately 46 persons/ sq. mile. Approximately one-quarter of the Ecological Landscape is publicly owned, very high for an Ecological Landscape this far south.

**Forest Transition** – Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the "Tension Zone") that runs southeast-northwest across the state. The mean growing season is 133 days, mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The growing season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. The Forest Transition was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Most soils are non-calcareous, moderately well-drained sandy loams derived from glacial till, but there is considerable diversity in the range of soil attributes. The area includes sandy soils formed in outwash, as well as organic soils, and loam and silt loam soils on moraines. There are many areas with shallow soils. Drainage classes range from poorly drained to excessively drained. Density of the till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition. Soils throughout the Ecological Landscape have silt loam surface deposits formed in aeolian loess, about 6 to 24 inches thick in much of the area. Major river systems draining this Ecological

Landscape include the Wolf, Wisconsin, Black, Chippewa, and St. Croix. Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the Ecological Landscape remains heavily forested, the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared), and the west end is a mixture of forest, lakes, and agricultural land. Population is estimated at 639,625, comprising 11.4% of the state total resulting in a population density of approximately 49 persons/ sq. mile. About 88% of all forested land is privately-owned while 12% belongs to the state, counties or municipalities.

**North Central Forest** – Typical of northern Wisconsin, mean growing season in the North Central Forest is 115 days, the shortest growing season of all Ecological Landscapes in the state. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean annual snowfall is 63 inches. However, heavier snowfall can occur closer to Lake Superior, especially in the northwestern part of the Ecological Landscape in the topographically higher Penoque-Gogebic Iron Range. The cool temperatures and short growing season are not conducive to supporting agricultural row crops such as corn in most parts of the Ecological Landscape. Only six percent of the North Central Forest is in agricultural use. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penoque-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands. Rivers, streams, and springs are common and found throughout this Ecological Landscape. Major rivers include the Wisconsin, Chippewa, Flambeau, Jump, Wolf, Pine, Popple, and Peshtigo. Large lakes include Namekagon, Courte Oreilles, Owen, Round, Butternut, North Twin, Metonga, Pelican, Pine, Kentuck, Pickerel, and Lucerne. Several large man-made flowages occur here such as the Chippewa, Turtle-Flambeau, Gile, Pine, and Mondeaux. There are several localized but significant concentrations of glacial kettle lakes associated with end and recessional moraines (e.g., the Perkinstown, Bloomer, Winegar, Birchwood Lakes, and Valhalla/Marenisco Moraines.) In southern Ashland and Bayfield counties, the concentrations of lakes are associated with till plains or outwash over till. Lakes here are due to dense till holding up the water table. Rare lake types in the North Central Forest include marl and meromictic lakes. Forests cover approximately 75% of this Ecological Landscape. The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack), non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marsh (including wild rice marshes) are widespread in the North Central Forest. Population is estimated

at 244,782, comprising 4.4% of the state total resulting in a population density of approximately 19 persons/ sq. mile. Forty-two percent is publicly owned, mostly by federal, state or county governments.

**Western Coulee & Ridges** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 43 inches. Because it extends over a considerable latitudinal area, the climate varies from north to south. The climate is favorable for agriculture, but steep slopes limit intensive agricultural uses to broad ridgetops and parts of valleys above floodplains. The climate variability, along with the rugged ridge and coulee (valley) topography, numerous microhabitats, and large rivers with broad, complex floodplains, allows for a high diversity of plants and animals. Characterized by its highly eroded, unglaciated topography with steep sided valleys and ridges, high gradient headwaters streams, and large rivers with extensive, complex floodplains and terraces. Ancient sand dunes occur on some of the broader terraces along the Mississippi and Wisconsin rivers. Windblown loess of varying thickness; alluvium in the floodplains. Organic soils, especially peats, are rare. Dendritic drainage patterns are well-developed in this mostly unglaciated Ecological Landscape. Natural lakes are restricted to the floodplains of large rivers. Large warmwater rivers are especially important here, and include the Wisconsin, Chippewa, and Black. The Mississippi River forms the Ecological Landscape's western boundary. Numerous spring-fed (coldwater) headwaters streams occur here. Coolwater streams are also common. Current vegetation is a mix of forest (41%), agriculture (36%), and grassland (14%) with wetlands (5%) mostly in the river valleys. Primary forest cover is oak-hickory (51%). Maple-basswood forests (28%), dominated by sugar maple, basswood and red maple, are common in areas that were not burned frequently. Bottomland hardwoods (10%) dominated by silver maple, swamp white oak, river birch, ashes, elms, and cottonwood are common within the floodplains of the larger rivers. Relict "northern" mesic conifer forests composed of hemlock, white pine and associated hardwoods such as yellow birch are rare but do occur in areas with cool, moist microclimates. Dry rocky bluffs may support xeric stands of native white pine, sometimes mixed with red or even jack pine. Prairies are now restricted to steep south- or west-facing bluffs, unplowed outwash terraces along the large rivers, and a few other sites. They occupy far less than 1% of the current landscape. Mesic tallgrass prairies are now virtually nonexistent except as very small remnants along rights-of-way or in cemeteries. Population is estimated at 614,553, comprising 10.8% of the state total resulting in a population density of approximately 54 persons/ sq. mile. Public ownership in this Ecological Landscape is limited (only about 3%) and much of it is associated with the large rivers (i.e. Mississippi, Wisconsin, Chippewa and Black rivers).

**Western Prairie** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.1, and mean annual snowfall is 45.4 inches. The climate and topography was favorable to frequent fires that resulted in prairie vegetation occurring in almost a third of the area prior to Euro-American times. The length of the growing season, adequate precipitation, and favorable temperatures make the climate favorable for agriculture, which is prevalent here. The Landscape is entirely glaciated. Major landforms are rolling till plain, with end moraine in the northwest and small areas of outwash. Soils are predominantly formed in loamy till glacial deposits, while some are in outwash. A loess cap of aeolian silt is 6 to 48 inches thick over the surface. The dominant soil is well drained and loamy with a silt loam surface, moderate permeability, and moderate

available water capacity. The Lower St. Croix River forms the western boundary of this Ecological Landscape (however, note that this Ecological Landscape is part of a larger ecological region, Subsection 222 Md, which extends west into Minnesota). Other important though much smaller rivers include the Apple, Kinnickinnic, and Willow. Most of the rivers drain westward to the St. Croix, with several draining south directly into the Mississippi, and a few flowing southeast to the Chippewa. Inland lakes, mostly seepage lakes and ponds, are most common in the northwestern part of the Landscape, in an area known informally as Wisconsin's "Prairie Pothole Region". There are multiple dams on the Willow River, and the Kinnickinnic has been dammed at River Falls. Many wetlands have been lost or severely altered by agricultural activities, which have been widespread and intensive in this productive Landscape. Almost half of the current land cover is agricultural crops and about one third of the area is grasslands, with smaller amounts of forest, open water, open wetlands, and urban areas. The major forest types are maple-basswood and oak-hickory, with lesser amounts of lowland hardwoods. Native coniferous forests are rare, and are limited to a few tamarack swamps and small scattered stands of pine on steep rocky slopes. Population is estimated at 120,708, comprising 2.2% of the state total resulting in a population density of approximately 77 persons/ sq. mile. Only three percent of the Western Prairie is in public ownership, much of it associated with the St. Croix, Kinnickinnic, and Willow rivers.

This Service area can be further broken down into five smaller HUC-8 watersheds, the Rush-Vermillion Rivers (07040001), Trempealeau River (07040005), Buffalo-Whitewater Rivers (07040003), La Crosse-Pine Rivers (07040006) and the Black River (07040007). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

## **Element II. Threats:**

Overall wetland resource threats within this service area include flooding along the western and central portions, water quality along the western watershed areas resulting in 303d listed impaired waters, invasive species brought in through recreational usage and commercial transport, fragmentation of corridors, high utilization of groundwater in the southwestern portions and land use changes. The northeastern lobe of this service area (Forest Transition & North Central Forest **WDNR 2012**) where a small northern fringe of forest exists along with large tracts of agriculture throughout has lost significant areas of forest. Resources are highly fragmented limiting any large scale potential projects. Threats also stem from a complex interaction of roles played by and ecological relationships among public, private, industrial, and tribal lands from a conservation, socioeconomic, and recreational perspectives. Other important factors to consider include: the potential implications of climate change; ecological impacts of increased biomass harvest; forest type conversions; forest simplification and homogenization. The central portions of this service area (Central Sand Plains and Western Coulee & Ridges **WDNR 2012**) is dealing with groundwater withdrawals and potential contamination concerns due to the high productivity and infiltration rates of its sandy soils and high water tables. Invasive species is again a threat as with most areas of the state. This southern region contains some of the highest urbanized

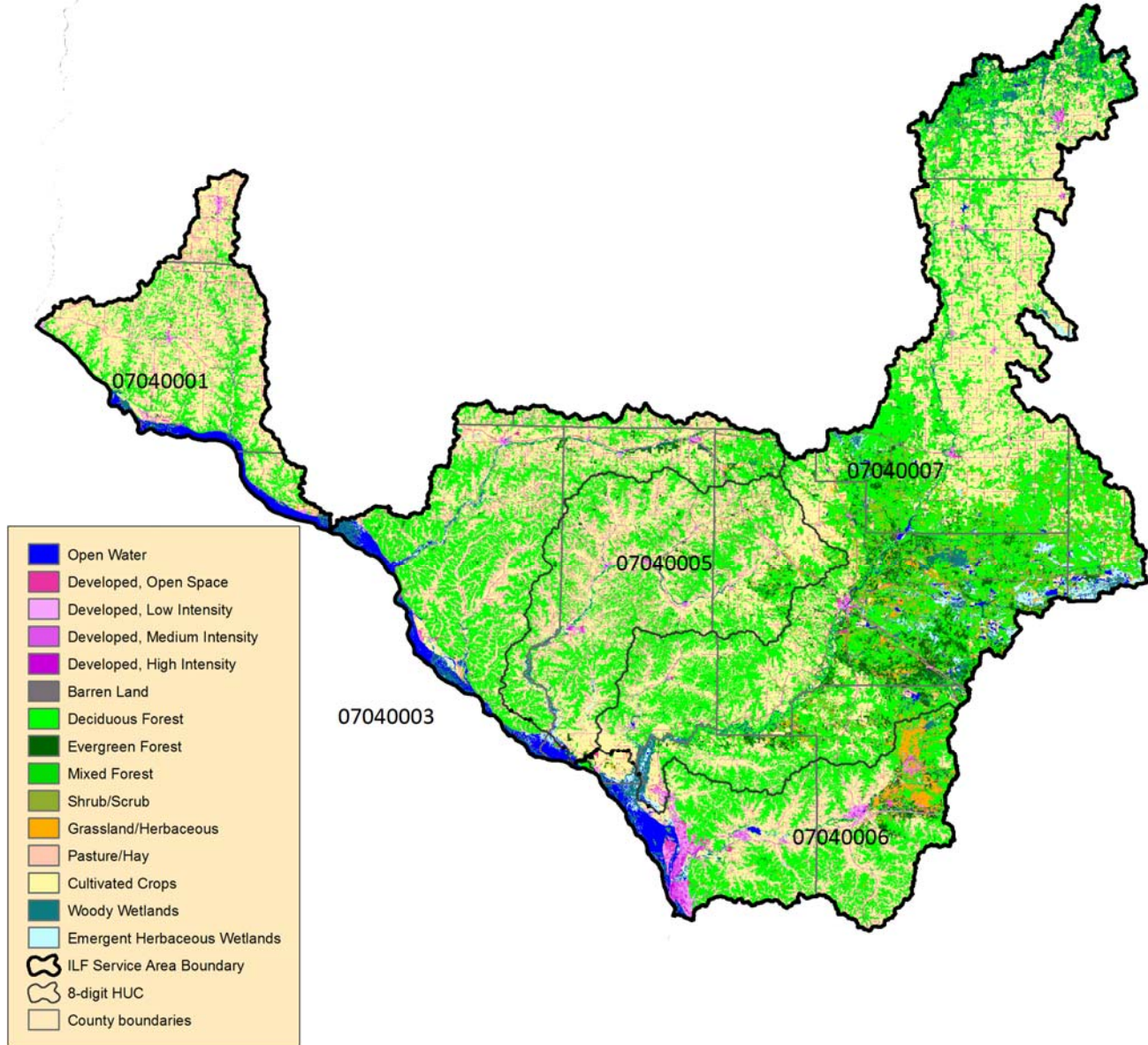
regions of this service area with agriculture, residential and overall development having the greatest impact. Flooding along the western border areas is a major problem with this portion of the state seeing the most flood disaster declarations in the state. As one reflection of this invasive species overrun the heaviest visited areas within this section. Dams exist throughout this area and results in fragmentation aquatic habitats. Groundwater withdrawals in the southern portions also pose a major threat. The northwestern lobe (Western Prairie **WDNR 2012**) has a dominance of agriculture land use activities, with residential development on the rise.

The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average

**Current Land Use:**

**Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**

(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07040001 - Rush-Vermillion Rivers	328,787	21,514	201,308	105,965	6.54%	61.23%	32.23%
07040005 - Trempealeau River	467,369	22,757	230,685	213,927	4.87%	49.36%	45.77%
07040003 - Buffalo-Whitewater Rivers	470,693	21,903	199,458	249,332	4.65%	42.38%	52.97%
07040006 - La Crosse-Pine Rivers	384,039	39,774	128,143	216,122	10.36%	33.37%	56.28%
07040007 - Black River	1,455,525	70,773	497,248	887,504	4.86%	34.16%	60.97%

The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture

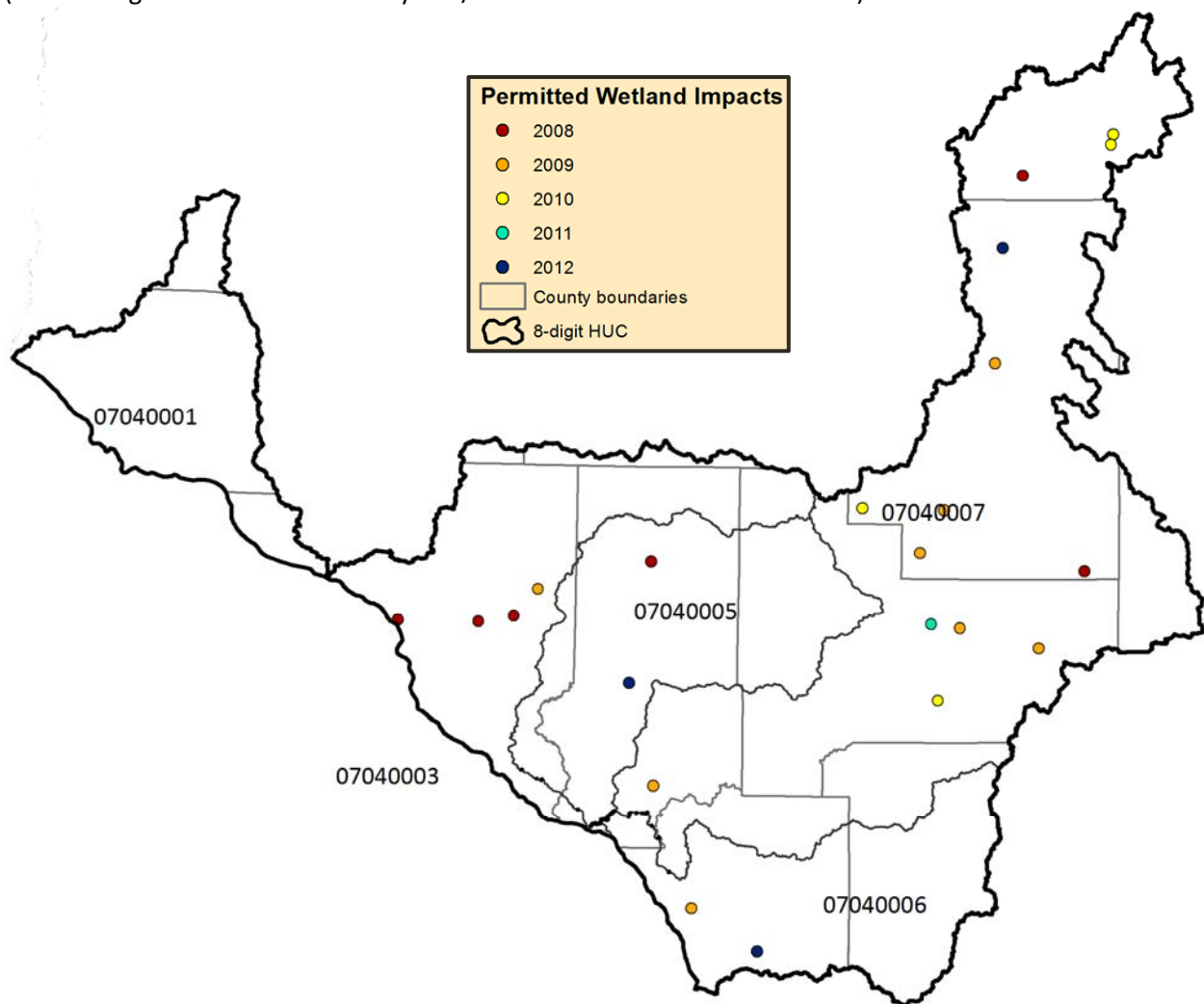
acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Rush-Vermillion Rivers HUC-07040001 and Trempealeau River HUC-07040005 have the least amount of natural land use remaining along with the greatest threat from agriculture activities.

#### Corps Permit Trends:

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

#### Corps Permit Impacts (2008-2012) per HUC-8

(black straight lines indicate County and/or State boundaries for reference)



**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07040007 - Black River	56%	0%	25%	3%	15%	1%	15.391
07040005 - Trempealeau River	10%	0%	90%	0%	0%	0%	0.624
07040003 - Buffalo-Whitewater Rivers	97%	0%	0%	3%	0%	0%	0.187
07040006 - La Crosse-Pine Rivers	0%	0%	100%	0%	0%	0%	0.072
07040001 - Rush-Vermillion Rivers	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0

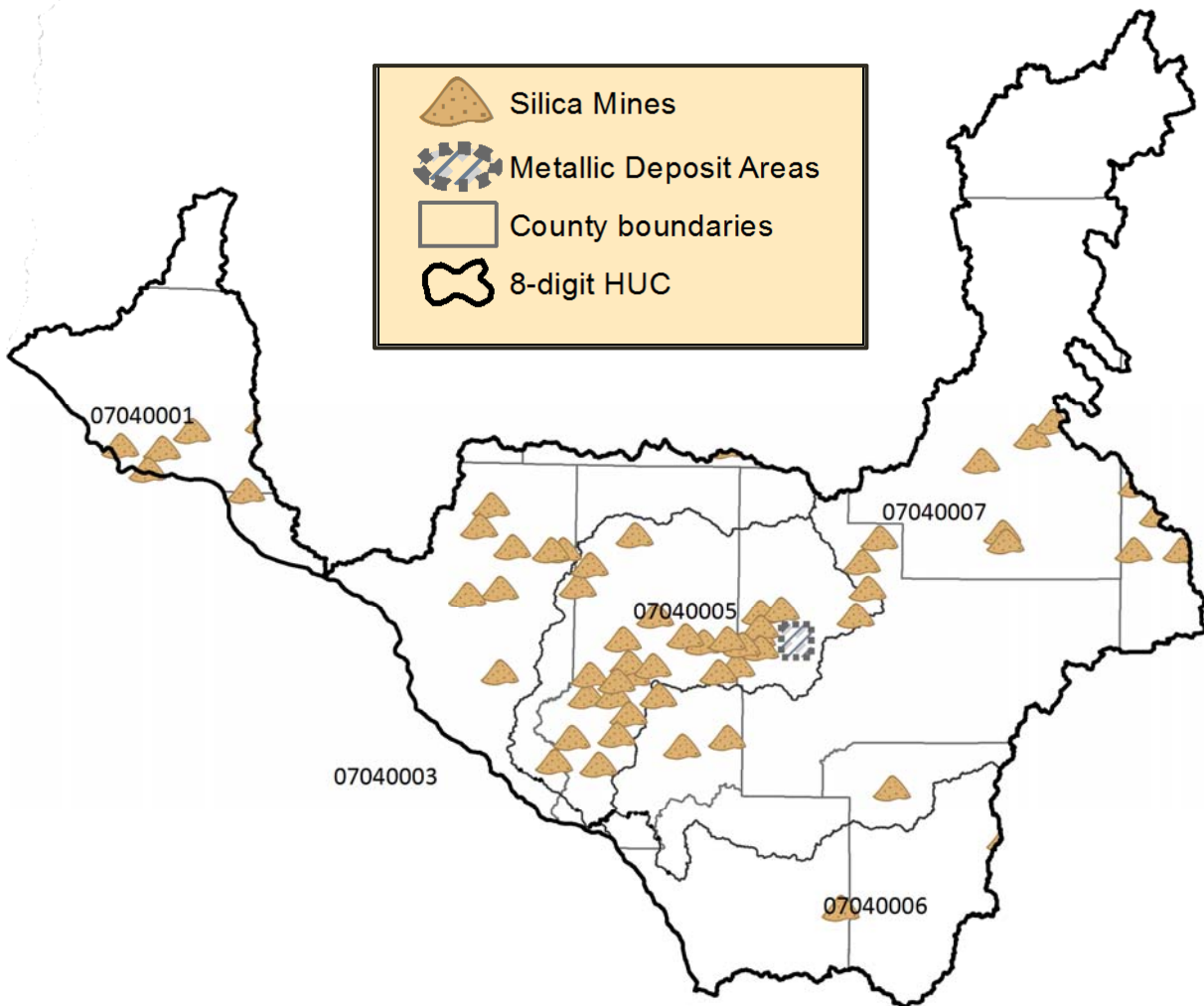
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

While this SA does not contain any current metallic exploration areas it does intersect with portions of non-metallic mining zones as depicted in the below map. These Frac Sand mines and processing facilities fall within the Trempealeau River HUC-07040005, Rush-Vermillion Rivers HUC – 07040001 and La Crosse-Pine Rivers HUC-07040006 thus presenting an increased future threat within these watersheds giving them greater priority.

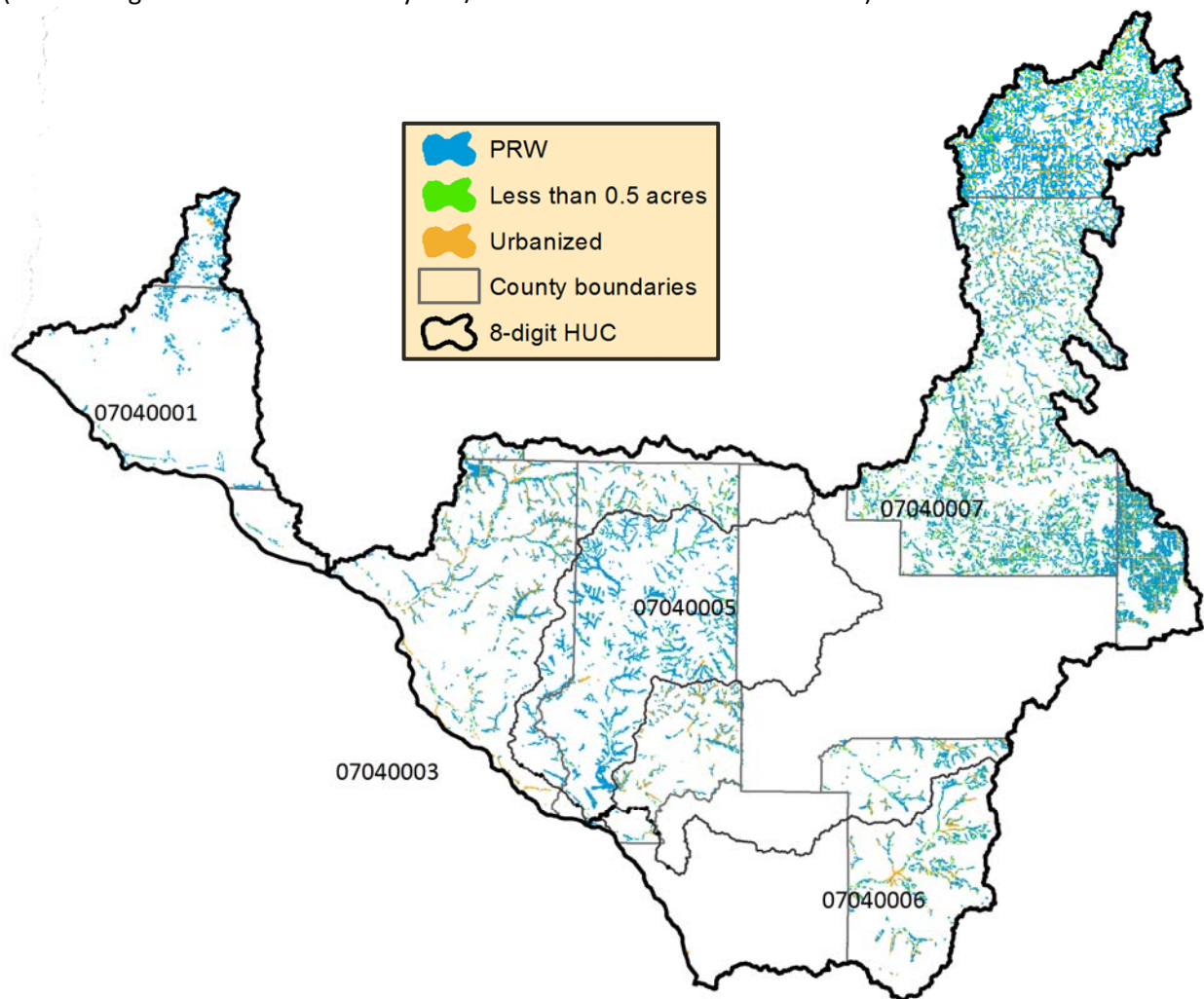
**Potential Mining Impacts per HUC-8 Watershed**

(black straight lines indicate County and/or State boundaries for reference)

**Element III. Historic Loss:**

This watershed's historical activity is rooted in logging practices, agriculture activities and dams for grain mills. These past land use activities brought with them more settlers looking to participate in the growing economy leading to further wetland loss and adverse impacts as settlement grew (**WDNR Basin Website 2013**). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
 (black straight lines indicate County and/or State boundaries for reference)



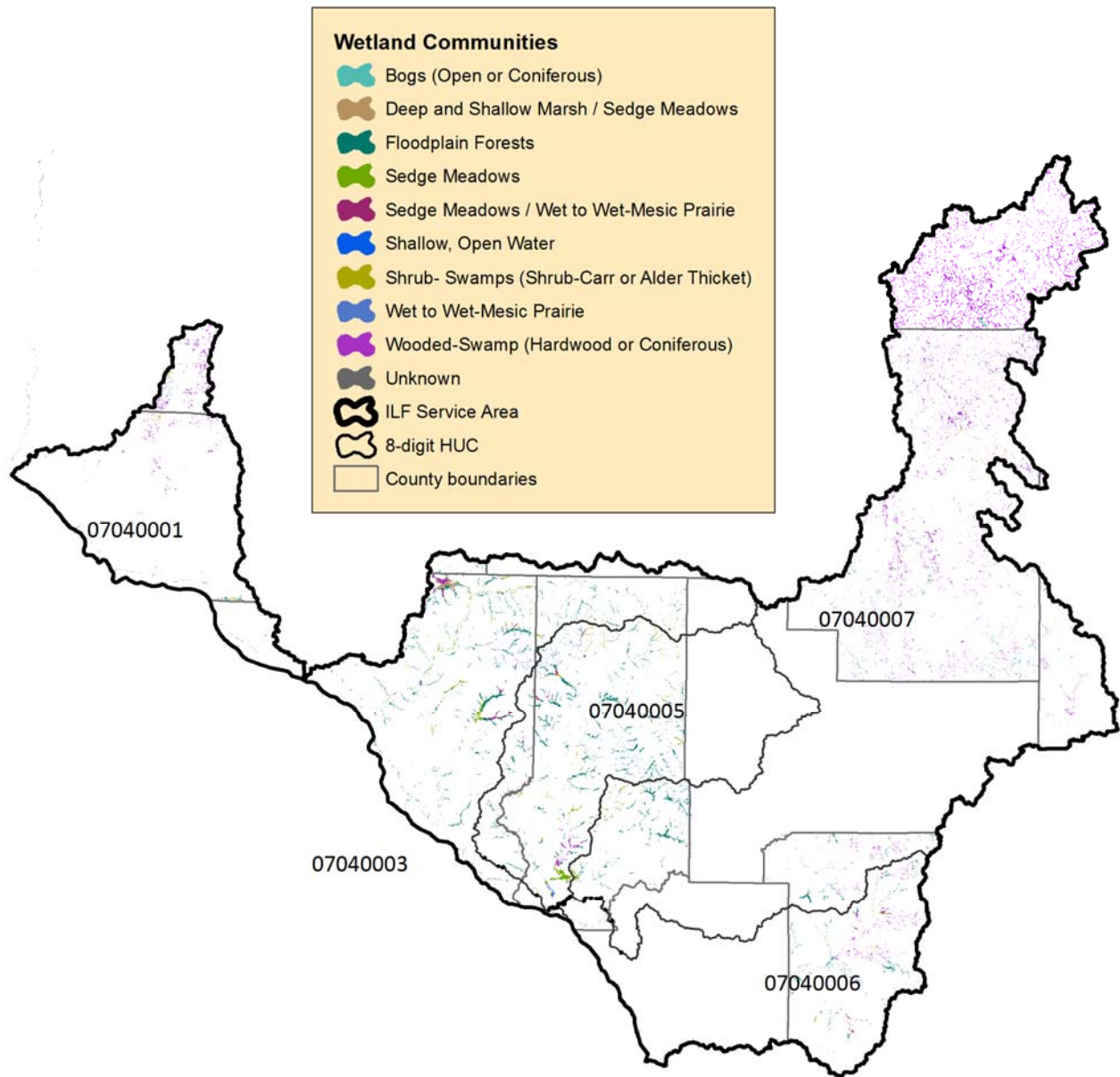
**Overall Estimated Historic Wetland Percent Loss Summary**  
 (sorted from greatest to least historic loss)

HUC	Acres of PRW Opportunity	Historic Wetland Loss % (Total PRW all / Total historic)
07040005 - Trempealeau River	12,320	39.00%
07040003 - Buffalo-Whitewater Rivers	10,625	25.34%
07040001 - Rush-Vermillion Rivers	3,670	23.70%
07040006 - La Crosse-Pine Rivers	2,738	23.36%
07040007 - Black River	47,475	21.38%

The map and table identify that the Trempealeau River HUC – 07040005 has sustained the greatest historic loss of wetlands. However, it should be noted that Jackson county and La Crosse county do not currently have digitally available WWI or PRW data, which effects major portions of the Black River HUC-07040007, La Crosse-Pine Rivers HUC-07040006 and to a lesser degree the Trempealeau River HUC-07040005. Therefore, when establishing the priority HUC-8 watershed to target for mitigation projects greater weight was placed upon the other threats factors such as land use, permit trends and future threats.

#### Estimated Historic Loss of Wetland Types per HUC-8

(black straight lines indicate County and/or State boundaries for reference)



**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
07040005 - Trempealeau River	#DIV/0!	42.20%	33.27%	68.16%	32.37%	14.57%	31.05%	#DIV/0!	38.90%	28.36%
07040003 - Buffalo-Whitewater Rivers	34.70%	84.33%	24.74%	37.09%	48.80%	5.24%	30.92%	#DIV/0!	24.41%	54.01%
07040001 - Rush-Vermillion Rivers	#DIV/0!	#DIV/0!	9.71%	66.32%	#DIV/0!	1.37%	76.73%	5.29%	53.91%	41.80%
07040006 - La Crosse-Pine Rivers	#DIV/0!	31.00%	24.15%	66.92%	29.43%	44.02%	42.74%	#DIV/0!	0.85%	36.73%
07040007 - Black River	1.14%	0.02%	22.18%	87.79%	58.48%	7.18%	21.37%	#DIV/0!	0.12%	19.40%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

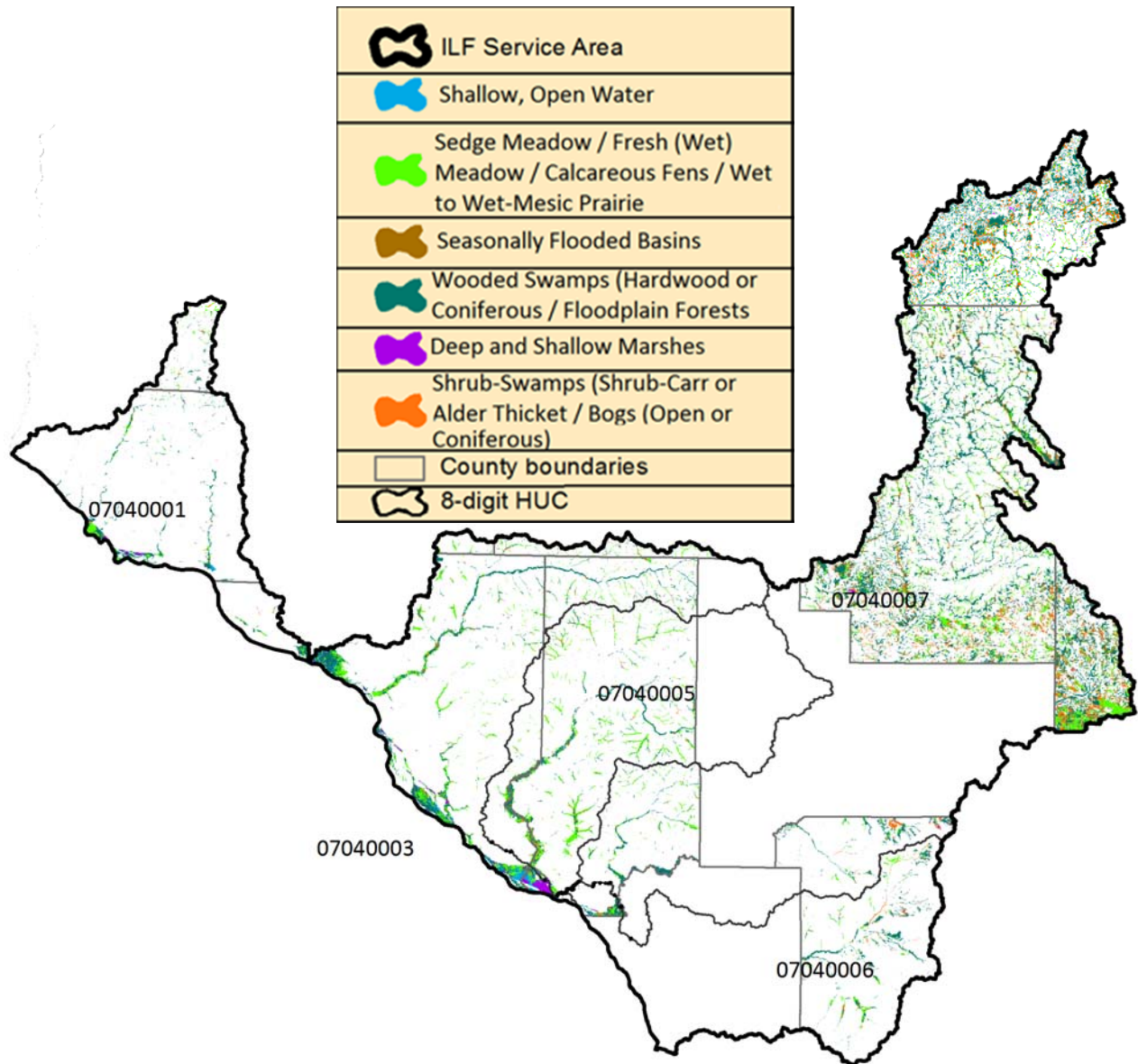
**Element IV. Current Conditions:**

The Upper Mississippi – Black Root Watershed Service area is comprised of five HUC-8 watersheds commonly referred to as the Great Western Rivers that drain directly into the Mississippi River. The overall SA contains mainly forested and agricultural land use activities. In addition mining, timber and other resource related industries operate within this area. Urban and rural non-point runoff, barnyard runoff, non-stabilized riparian areas and water quality threats pose risks to the watershed health. This SA spans both large portions of the driftless area of the state viewed for miles from the regions steep bluffs as well as those areas impacted by the last glacier. Coldwater streams can be readily found within this area supported by groundwater discharges. Portions of this SA also contain many natural stream channels whose meandering pathways have never been channelized (**WDNR Basin Website 2013**).

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07040007 - Black River	106.23	42,533.97	38.81	103,299.65	1,870.99	45,970.45	194,184.58
07040003 - Buffalo-Whitewater Rivers	2,232.39	11,980.35	20.05	16,550.21	2,081.07	3,377.61	36,520.45
07040005 - Trempealeau River	68.30	9,664.29	5.56	7,426.54	70.68	2,411.47	19,673.90
07040001 - Rush-Vermillion Rivers	164.66	3,280.50	0.00	7,563.44	602.94	512.89	12,268.79
07040006 - La Crosse-Pine Rivers	140.53	2,552.86	0.00	7,184.89	94.21	1,486.93	11,464.07

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07040007 - Black River	0.05%	21.90%	0.02%	53.20%	0.96%	23.67%	100.00%
07040003 - Buffalo-Whitewater Rivers	6.11%	32.80%	0.05%	45.32%	5.70%	9.25%	100.00%
07040005 - Trempealeau River	0.35%	49.12%	0.03%	37.75%	0.36%	12.26%	100.00%
07040001 - Rush-Vermillion Rivers	1.34%	26.74%	0.00%	61.65%	4.91%	4.18%	100.00%
07040006 - La Crosse-Pine Rivers	1.23%	22.27%	0.00%	62.67%	0.82%	12.97%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.
8. Restore, enhance, establish and/or preserve 5 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is

dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Trempealeau River****HUC – 07040005**

This watershed has lost approximately 39.00% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 0.0624 acres of wetland loss, which is very minimal within this overall service area. Historic percentage losses were wide spread across most wetland types with Sedge Meadows leading the way followed closely by Deep and Shallow Marshes, Floodplain Forests, Wet to Wet-Mesic Prairie, Shrub Swamps and Hardwood Swamps. Therefore estimated historic acreage losses were examined more closely to reveal that Floodplain Forests, Sedge Meadows and Shrub Swamps sustained the most significant losses. The overall land use within this watershed is largely spit between agriculture at 49.36% followed closely by natural categories at 45.77%. The agriculture land use area is comprised of mainly cultivated crops, while the natural land use is comprised of mainly deciduous forest and shrub/scrub followed by similar proportions of evergreen forest, emergent herbaceous wetlands, woody wetlands and grassland/herbaceous areas. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie followed by Floodplain Forests and Wooded Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) will fit well within this watershed given the overall mix of forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Floodplain Forests, Wooded Swamps (Hardwood or Coniferous) and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Rush-Vermillion Rivers****HUC – 07040001**

This watershed has lost approximately 23.70% of its overall historic wetlands, which is moderate for this service area. Corps permitted actions over the past 5 years depict 0 acres of wetland loss, which is very minimal within this overall service area. Historic percentage losses were wide spread across most wetland types with Shrub Swamps leading the way followed closely by Sedge Meadows, Wet to Wet-Mesic Prairie, Wooded Swamps and Floodplain Forests. Therefore estimated historic acreage losses were examined more closely to reveal that Wooded Swamps, Floodplain Forests, Shrub Swamps and Wet to Wet-Mesic Prairies sustained the most significant losses. The overall land use within this watershed is dominated by agriculture at 61.23% followed by natural categories at 32.23% and developed at 6.54%. The agriculture land use area is comprised of mainly cultivated crops, while the natural land use is comprised of mainly deciduous forest, open water and woody wetlands. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet)

Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie. Therefore, replacing Wooded Swamps, Floodplain Forests, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall mix of forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests, Sedge Meadows, Wet to Wet-Mesic Prairies and Fresh (Wet) Meadows
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Ephemeral Pond and Calcareous Fen.

#### **La Crosse-Pine Rivers HUC – 07040006**

This watershed has lost approximately 23.36% of its overall historic wetlands, which is moderate for this service area. Corps permitted actions over the past 5 years depict 0.072 acres of wetland loss, which is minimal within this overall service area. Historic percentage losses were high for Sedge Meadows at 66.92% and then wide spread across all remaining wetland types except for Bogs. Therefore estimated historic acreage losses were examined more closely to reveal that Wooded Swamps, Floodplain Forests, Shrub Swamps and Sedge Meadows sustained the most significant losses. The overall land use within this watershed remains mostly natural at 56.28% followed by agriculture at 33.37% and developed at its highest service area value of 10.36%. The natural land use area is comprised of mainly deciduous forest, grassland/herbaceous, open water and woody wetlands, while the agriculture land use is comprised of mainly cultivated crops. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie. Therefore, replacing Wooded Swamps, Floodplain Forests, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall mix of forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests, Sedge Meadows and Fresh (Wet) Meadows
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

#### **Black River HUC – 07040007**

This watershed has lost approximately 21.38% of its overall historic wetlands, which is the lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 15.391 acres of wetland loss, which is the highest for this overall service area. Historic percentage losses were high for Sedge Meadows and then wide spread across Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore estimated historic acreage losses were examined more closely and revealed the

same significant acreage losses for those identified wetland types of high estimated percentage loss. Permit impact trends did not specify the type for the majority of its losses. The overall land use within this watershed remains mostly natural at 60.97% followed by agriculture at 34.16% and developed relatively low at 4.86%. The natural land use area is comprised of mainly deciduous forest and then somewhat evenly distributed amongst the remaining forested categories, emergent, herbaceous, grassland and open water fields, while the agriculture land use is comprised of overwhelmingly cultivated crops at the highest cover in the entire service area. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Shrub Swamps, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie. Therefore, replacing Wooded Swamps, Floodplain Forests, Shrub Swamps, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall mix of forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Bog (Coniferous or Open).

- Restore and enhance Wooded Swamps, Floodplain Forests, Shrub Swamps, Sedge Meadows and Fresh (Wet) Meadows.
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Bog (Coniferous or Open).

#### **Buffalo-Whitewater Rivers      HUC – 07040003**

This watershed has lost approximately 25.34% of its overall historic wetlands, which is the second highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 0.187 acres of wetland loss, which is minimal for this overall service area. Historic percentage losses were high for Sedge Meadows and then wide spread across all remaining wetland types, except for Shallow Open Water. Therefore estimated historic acreage losses were examined more closely and revealed that Floodplain Forests and Sedge Meadows sustained the greatest estimated acreage losses, followed by Wet to Wet-Mesic Prairies, Shrub Swamps, Wooded Swamps and Deep and Shallow Marshes. Permit impact trends did not specify the type for the vast majority of its losses. The overall land use within this watershed is largely split between natural at 52.97% and agriculture at 42.38%, with a mere 4.65% developed representing the lowest for this service area. The natural land use area is comprised of mainly deciduous forest, open water, woody wetland and then somewhat evenly distributed amongst the remaining forested categories, emergent, herbaceous and grassland fields, while the agriculture land use is comprised of mostly cultivated crops. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Shrub Swamps, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie. Therefore, replacing Sedge Meadows, Wooded Swamps, Floodplain Forests, Shrub Swamps and Fresh (Wet) Meadows will fit well within this watershed given the overall mix of forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands:

Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Wooded Swamps, Floodplain Forests, Shrub Swamps and Fresh (Wet) Meadows.
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Existing Advanced Watershed Plans (AWP): None**

#### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

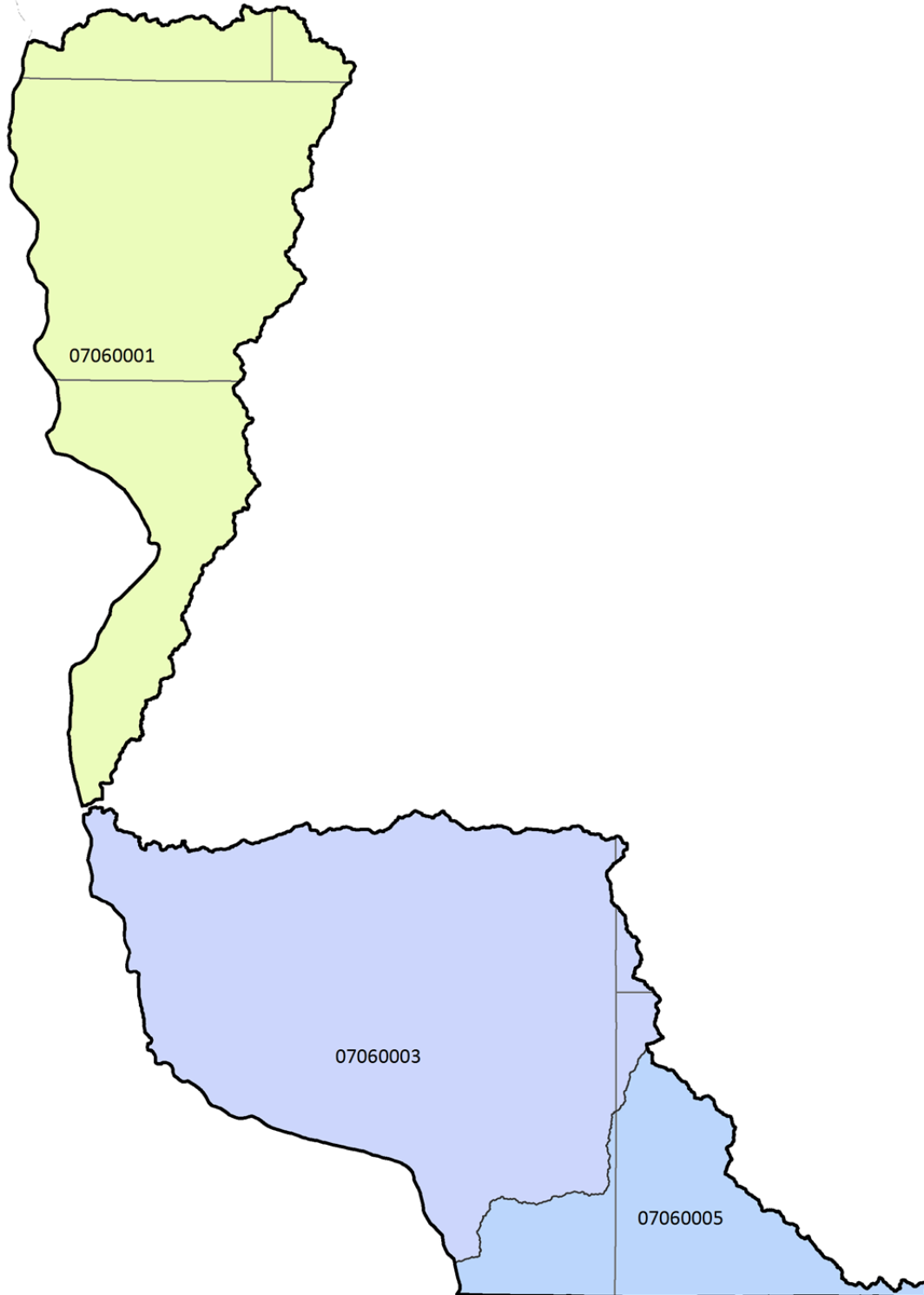
**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Upper Mississippi – Maquoketa Plum CPF

### Element I. Service area:

#### Overall SA Area with separate HUC-8 watersheds designated in color

(county & state boundaries shown in straight lines for further reference)

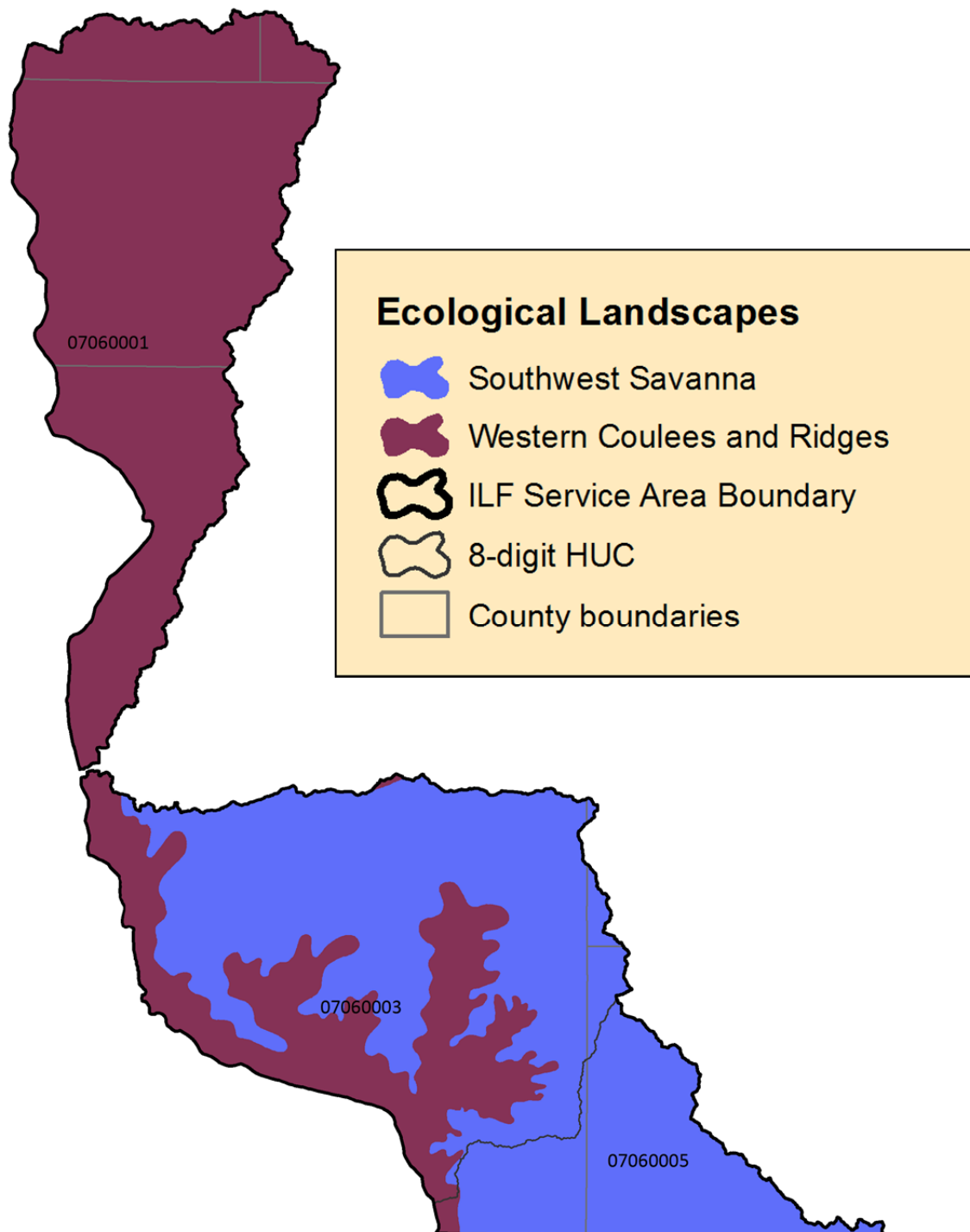


November 12, 2014

The Upper Mississippi – Maquoketa Plum Service area is located at the south western tip of Wisconsin comprised of La Crosse, Monroe, Vernon, Crawford, Grant, Iowa and La Fayette counties and drains an area approximately 1,730 square miles.

Ecological Landscapes include (*WDNR 2012*):

**Ecological Landscapes per HUC-8**



**Southwest Savanna** – Typical of southern Wisconsin; the mean growing season is 153 days, mean annual temperature is 45.6 deg. F, mean annual precipitation is 35.2, and mean annual snowfall is 39.9 inches. However, the Southwest Savanna has the fourth longest growing season, the most precipitation, the third lowest snowfall, and second warmest January low temperature among Ecological Landscapes in the state. The climate tends to be warmer in the southwestern part of the state, which affects the ecology of the Southwest Savanna and also makes it suitable for most agricultural uses. 80% of this Ecological Landscape is devoted to row crops, small grains, and pastures. The Southwest Savanna is part of Wisconsin's Driftless Area, a region that has not been glaciated for at least the last 2.4 million years. The topography is characterized by broad, open ridgetops, deep valleys, and steep, wooded slopes. Soils on hilltops are silt loams mostly silt loams. In some areas soils are shallow, with bedrock or stony red clay subsoil very close to or at the surface. In other locales the ridgetops have a deep cap of loess-derived silt loam (these are the most productive agricultural soils). Valley soils include alluvial sands, loams, and occasionally, peats. The drainage patterns of streams in the Southwest Savanna are dendritic, which is a pattern characteristic of unglaciated regions but absent or uncommon in most of Wisconsin. Flowing waters include warmwater rivers and streams, coldwater streams, and springs. Natural Lakes are virtually absent, though there are a few associated with the floodplains of the larger rivers. Natural lakes are rare but there are a few in the floodplains of the larger rivers, such as the Pecatonica. Impoundments and reservoirs have been constructed on some rivers and streams, and check dams have been built in ravines to hold storm and snow runoff. Agricultural crops (corn, soybeans, small grains, hay) cover 70% of this Ecological Landscape, with lesser amounts of grassland (mostly pasture), forest, and residential areas. The major forest types are oak-hickory and maple-basswood. Prairie remnants of varying quality persist in a few places, mostly on rocky hilltops or slopes that are too steep to farm. Some pastures have never been plowed, and those that historically supported prairie may retain remnants of the former prairie flora. Pastures with scattered open-grown oaks still exist in some areas, mimicking oak savanna structure. A complement of native plants persists in some of these pastured savannas. Population is estimated at 123,899, comprising 2.2% of the state total resulting in a population density of approximately 39 persons/ sq. mile. About 96.5% of the land in the Southwest Savanna is privately owned while 3.5% belongs to state, county, or municipal governments.

**Western Coulee & Ridges** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 43 inches. Because it extends over a considerable latitudinal area, the climate varies from north to south. The climate is favorable for agriculture, but steep slopes limit intensive agricultural uses to broad ridgetops and parts of valleys above floodplains. The climate variability, along with the rugged ridge and coulee (valley) topography, numerous microhabitats, and large rivers with broad, complex floodplains, allows for a high diversity of plants and animals. Characterized by its highly eroded, unglaciated topography with steep sided valleys and ridges, high gradient headwaters streams, and large rivers with extensive, complex floodplains and terraces. Ancient sand dunes occur on some of the broader terraces along the Mississippi and Wisconsin rivers. Windblown loess of varying thickness; alluvium in the floodplains. Organic soils, especially peats, are rare. Dendritic drainage patterns are well-developed in this mostly unglaciated Ecological Landscape. Natural lakes are restricted to the floodplains of large

rivers. Large warmwater rivers are especially important here, and include the Wisconsin, Chippewa, and Black. The Mississippi River forms the Ecological Landscape's western boundary. Numerous spring-fed (coldwater) headwaters streams occur here. Coolwater streams are also common. Current vegetation is a mix of forest (41%), agriculture (36%), and grassland (14%) with wetlands (5%) mostly in the river valleys. Primary forest cover is oak-hickory (51%). Maple-basswood forests (28%), dominated by sugar maple, basswood and red maple, are common in areas that were not burned frequently. Bottomland hardwoods (10%) dominated by silver maple, swamp white oak, river birch, ashes, elms, and cottonwood are common within the floodplains of the larger rivers. Relict "northern" mesic conifer forests composed of hemlock, white pine and associated hardwoods such as yellow birch are rare but do occur in areas with cool, moist microclimates. Dry rocky bluffs may support xeric stands of native white pine, sometimes mixed with red or even jack pine. Prairies are now restricted to steep south- or west-facing bluffs, unplowed outwash terraces along the large rivers, and a few other sites. They occupy far less than 1% of the current landscape. Mesic tallgrass prairies are now virtually nonexistent except as very small remnants along rights-of-way or in cemeteries. Population is estimated at 614,553, comprising 10.8% of the state total resulting in a population density of approximately 54 persons/ sq. mile. Public ownership in this Ecological Landscape is limited (only about 3%) and much of it is associated with the large rivers (i.e. Mississippi, Wisconsin, Chippewa and Black rivers).

This Service area can be further broken down into three smaller HUC-8 watersheds, the Apple-Plum Rivers (07060005), Grant-Little Maquoketa Rivers (07060003) and the Coon-Yellow Rivers (07060001). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

## **Element II. Threats:**

Overall wetland resource threats within this service area include flooding throughout, water quality in the north and central areas resulting in 303d listed impaired waters, invasive species in the central region, fragmentation of corridors and land use changes. The northern portion of this service area (Western Coulee & Ridges **WDNR 2012**) still remains dominated by natural land uses such as forest lands followed by agriculture. Major dams have been constructed on the Mississippi River, significantly altering and fragmenting aquatic habitats. Agriculture areas are found on terraces between floodplain areas and steep bluffs. The central and southern portions (Southwest Savanna **WDNR 2012**) are subject to agriculture and to a lesser degree development activities leading to fragmentation, surface water alteration and other adverse impacts such as pathways for invasives. Impaired waterways listed on the 303d list are also more prevalent in the southern portion of this service area.

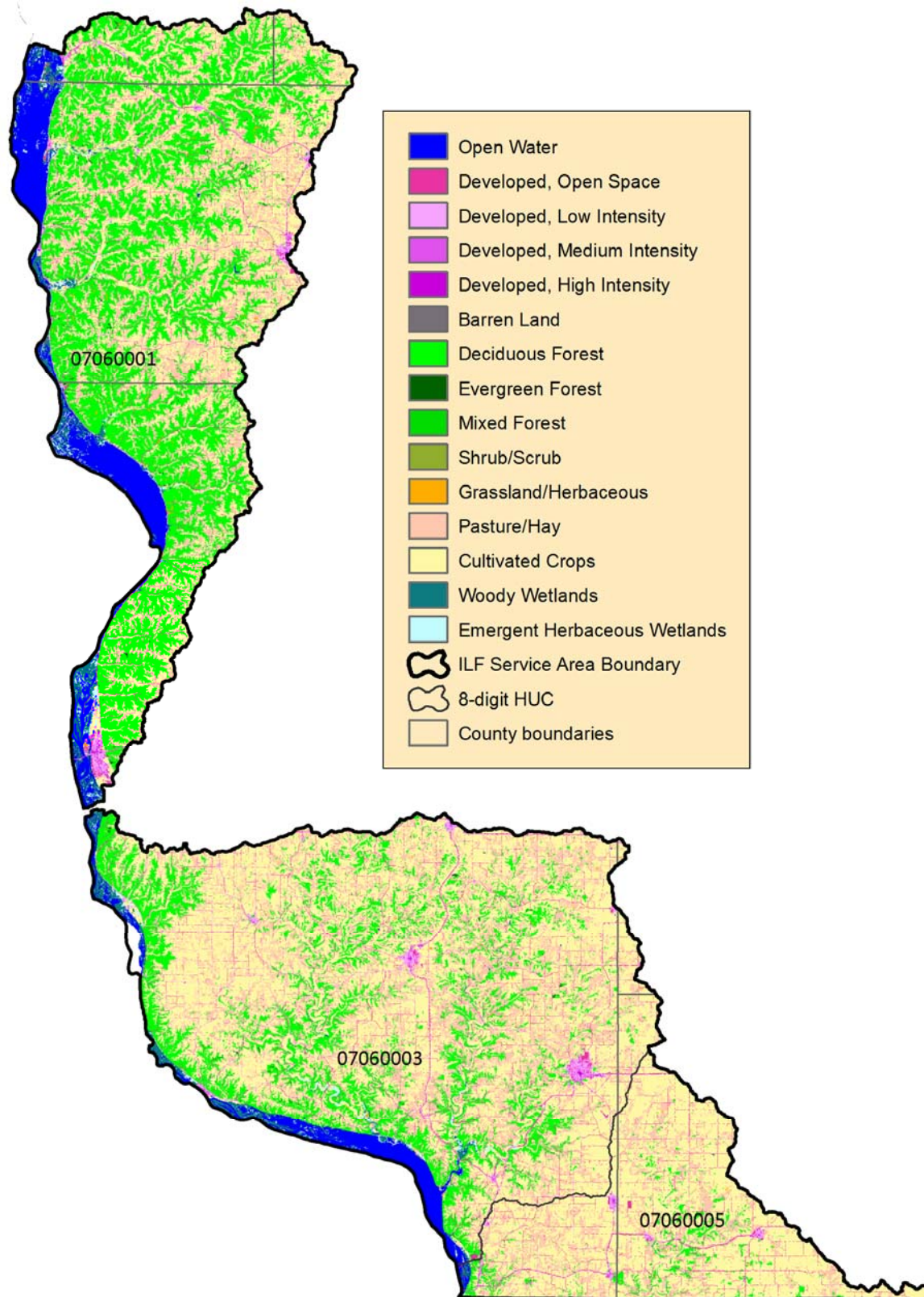
The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed

and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average

**Current Land Use:**

**Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



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**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07060005 - Apple-Plum Rivers	162,890	23,044	129,975	9,871	14.15%	79.79%	6.06%
07060003 - Grant-Little Maquoketa Rivers	507,391	28,565	360,051	118,775	5.63%	70.96%	23.41%
07060001 - Coon-Yellow Rivers	417,471	8,852	179,251	229,368	2.12%	42.94%	54.94%

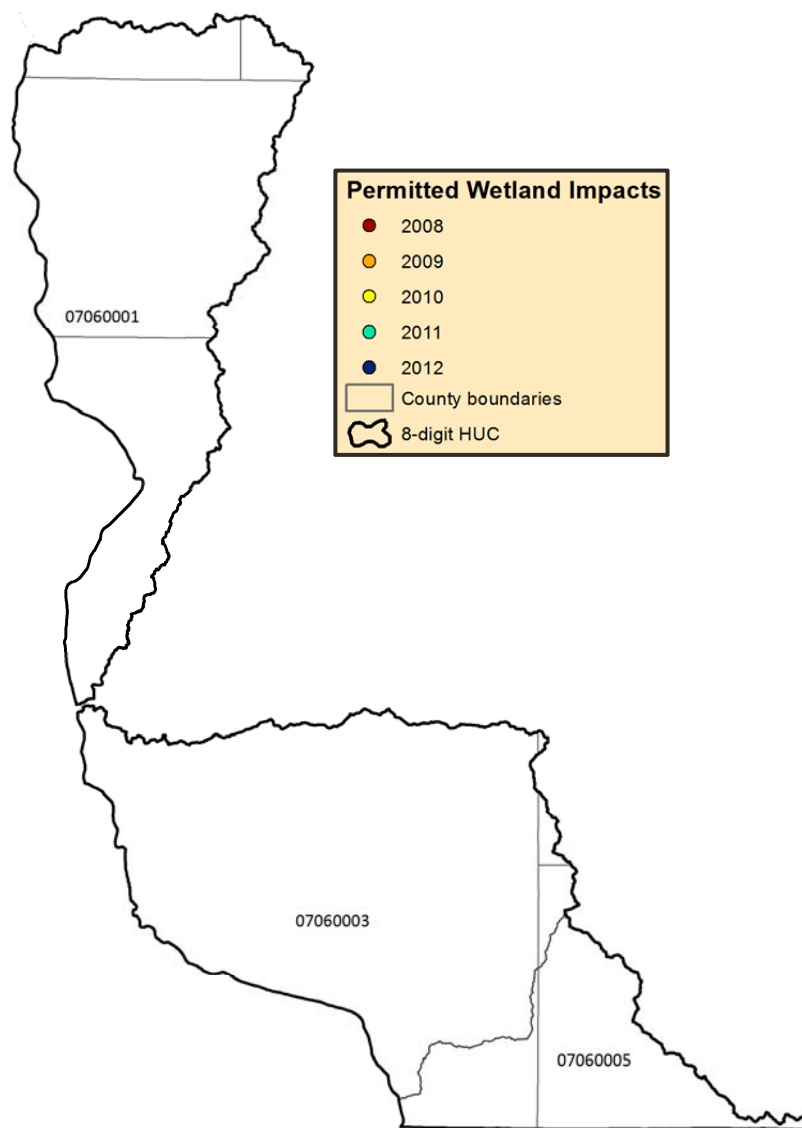
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Apple-Plum Rivers HUC-07060005 is under the greatest threat from agriculture with 79.79% of its area containing agriculture based land uses and only 6.06% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07060001 - Coon-Yellow Rivers	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	0
07060003 - Grant-Little Maquoketa Rivers	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	0
07060005 - Apple-Plum Rivers	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	#DIV/O!	0

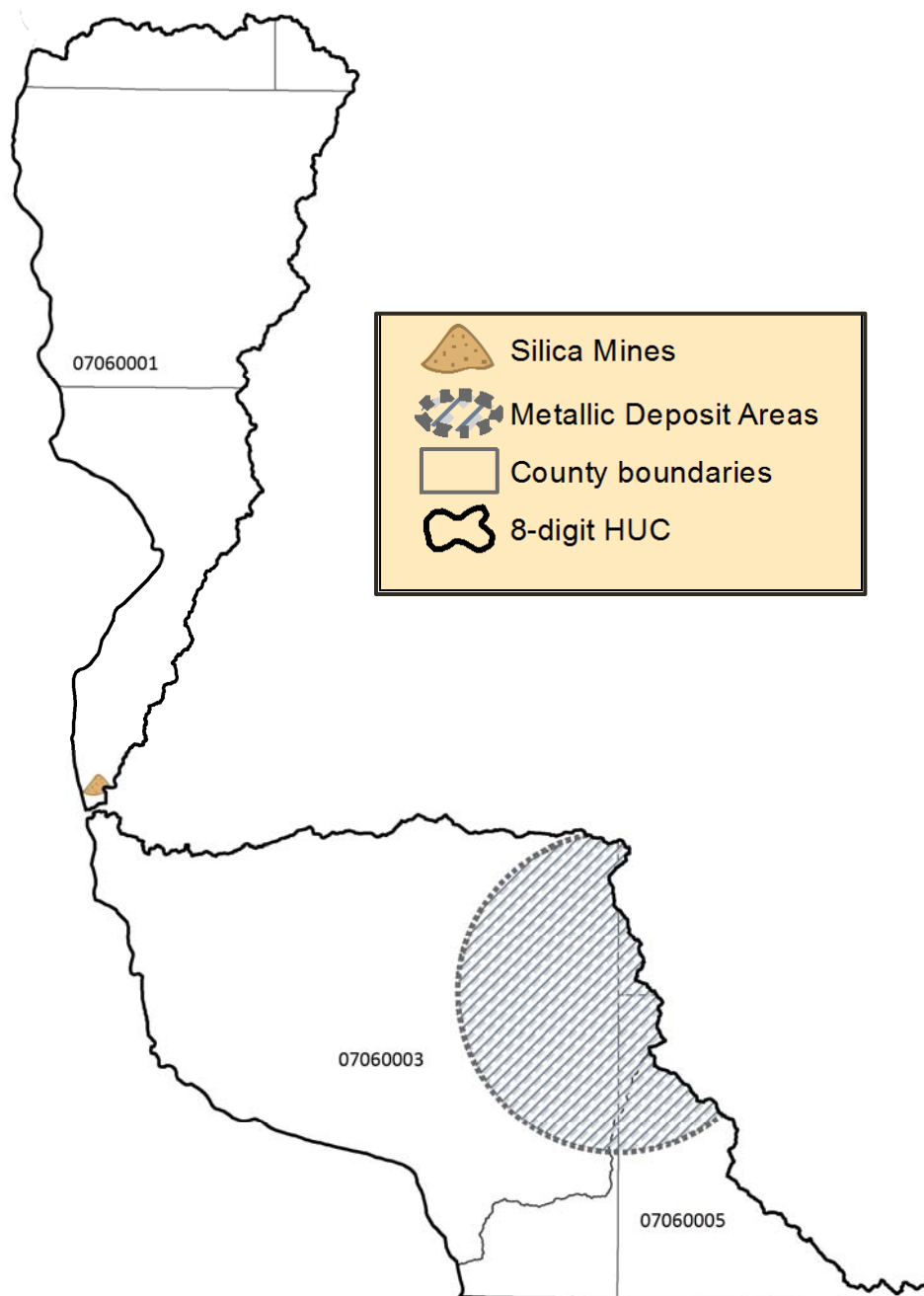
The map and table above depict an overall lack of permit impacts within this area over the past 5 years. Therefore, when prioritizing the targeted HUC-8 area for project selection greater weight was placed on historic loss, future threats along with WWI data.

**Anticipated Future Threats:**

The Mississippi - Maquoketa Plum SA does not intersect with any foreseen threats from non-metallic mining or current metallic exploration areas even through it contains a single silica mine and sits on the outskirts of the Lead Zinc District shown on the below map. There are also no foreseen major project impacts on the horizon that would elevate impacts making this the SA under the least threat statewide.

**Potential Mining Impacts per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

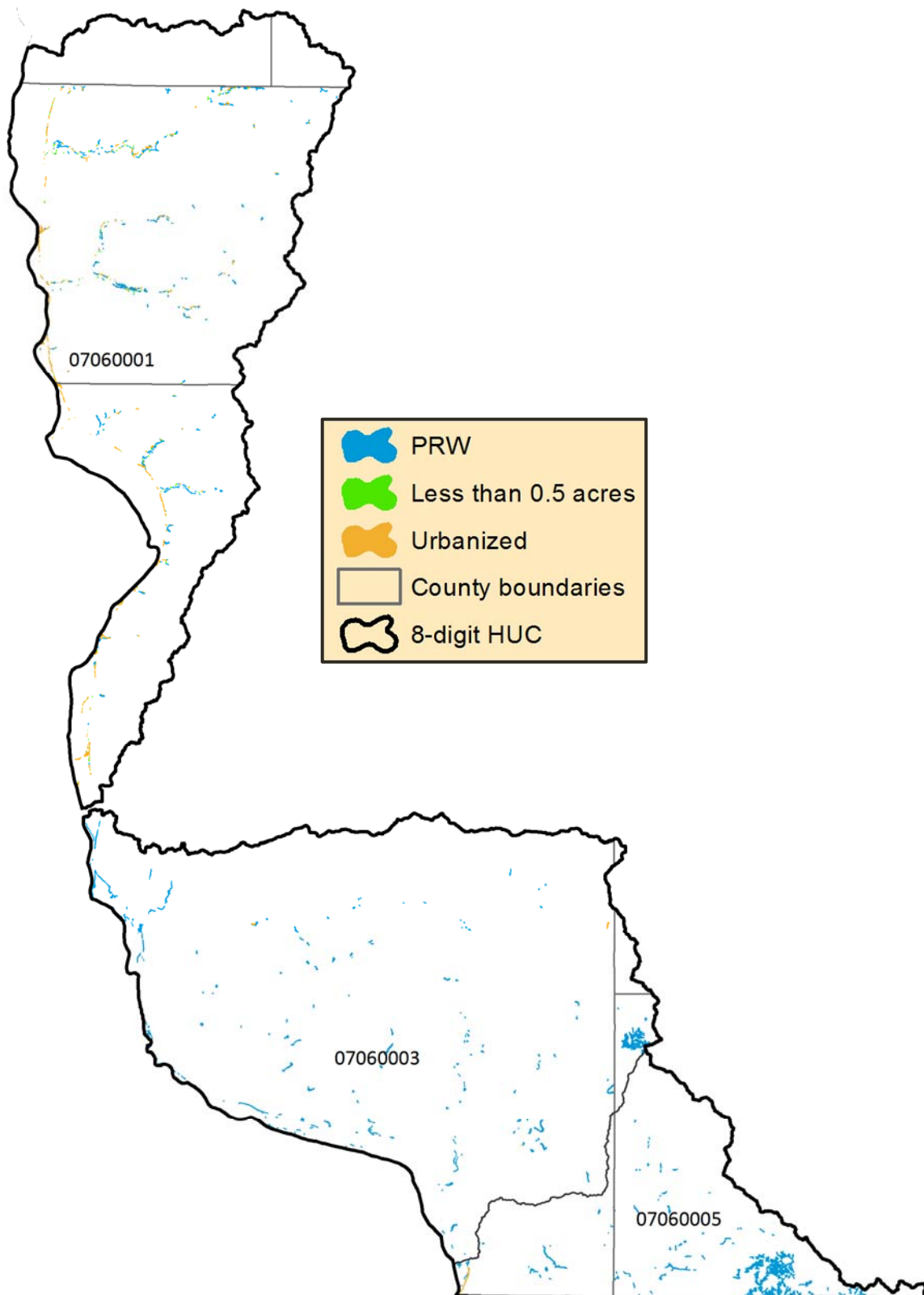


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**Element III. Historic Loss:**

The settlement of the lower portion of this watershed and its diverse elevations, ridges and coulees was centered on agricultural practices. Wetlands and their rich humus soil composition were drained, grazed and disturbed to fall within the realm of farming practices. Many streams and their associated wetland areas were dammed to power the mills for processing their harvest. Early farming did not have the benefit of modern soil conservation standards leading to sedimentation and nutrient loading of drainage areas. The upper portions of this watershed also followed the same agricultural path, but had a greater influence from the timber industry seeking to benefit from its higher density of original forest cover compared to the lower region comprised of large areas of prairie and oak opening (**WDNR Basin Website 2013**). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



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**Overall Estimated Historic Wetland Percent Loss Summary**

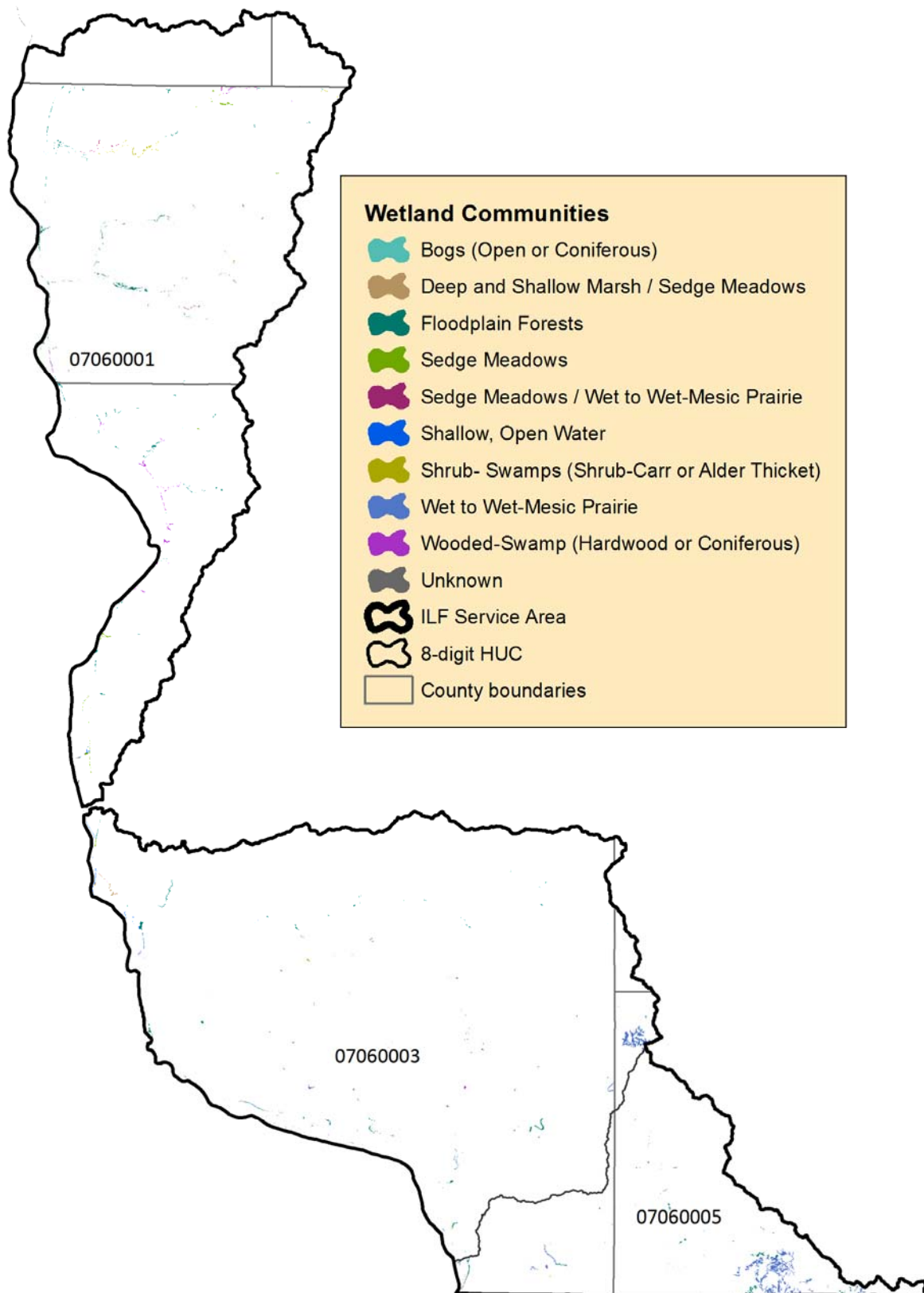
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
07060005 - Apple-Plum Rivers	2,152	77.82%
07060003 - Grant-Little Maquoketa Rivers	1,896	15.44%
07060001 - Coon-Yellow Rivers	898	6.22%

The information above identifies that the Apple-Plum Rivers HUC-07060005 has sustained the greatest historic loss of wetlands. This particular watershed contains a small portion of La Crosse county, which does not currently have digitally available WWI or PRW data affecting it to a small degree, however it overwhelming leads the way in this category.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



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**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
07060005 - Apple-Plum Rivers	#DIV/0!	#DIV/0!	64.54%	100.00%	#DIV/0!	25.94%	#DIV/0!	10.87%	97.54%	#DIV/0!
07060003 - Grant-Little Maquoketa Rivers	#DIV/0!	8.03%	21.11%	95.87%	13.03%	8.31%	16.28%	0.35%	93.01%	54.64%
07060001 - Coon-Yellow Rivers	#DIV/0!	0.00%	12.80%	37.53%	18.96%	0.84%	17.14%	1.44%	5.93%	27.33%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

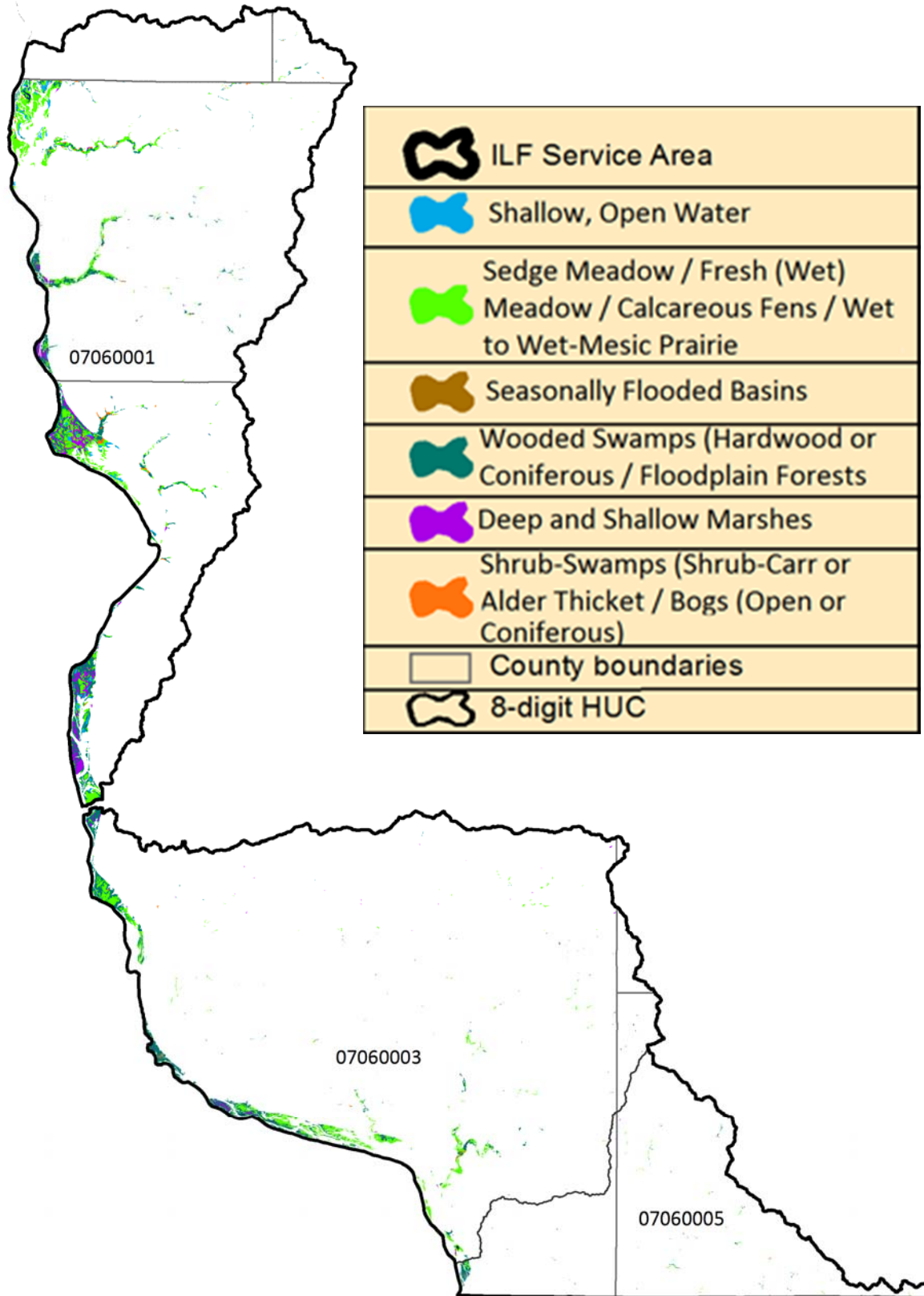
**Element IV. Current Conditions**

The Upper Mississippi-Maquoketa Plum SA area consists of mainly agricultural cross section with scattered pockets of urban influences. These agricultural roots are still seen as the major land use throughout this area resulting in the majority of factors contributing to wetland impacts. The northern portion of this SA contains numerous scenic vistas from hilltops and beautiful stream valleys. The steep-forested hillsides coexist with agricultural activities located in the more level valleys. Existing in the driftless area of the state this area is drained by a highly dendritic network of primarily cold, groundwater fed systems. The mainly rural character and small localized urban pockets of the area reflected by head of cattle outnumbering people results in impact threats stemming from stormwater runoff, barnyard runoff and stream bank erosion increasing sedimentation as those leading the way. Given the prevalence of cultivated crops and pasture land uses, non-point runoff and water quality issues are paramount to the overall health of this watershed.

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07060001 - Coon-Yellow Rivers	1,291.36	9,487.24	0.00	8,212.91	2,886.53	642.93	22,534.49
07060003 - Grant-Little Maquoketa Rivers	43.93	5,060.90	0.00	4,929.66	448.32	124.16	10,606.96
07060005 - Apple-Plum Rivers	22.27	212.27	0.00	327.52	28.04	8.74	628.45

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07060001 - Coon-Yellow Rivers	5.73%	42.10%	0.00%	36.45%	12.81%	2.85%	100.00%
07060003 - Grant-Little Maquoketa Rivers	0.41%	47.71%	0.00%	46.48%	4.23%	1.17%	100.00%
07060005 - Apple-Plum Rivers	3.54%	33.78%	0.00%	52.12%	4.46%	1.39%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other

important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.

8. Restore, enhance, establish and/or preserve 5 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Apple-Plum Rivers****HUC – 07060005**

This watershed has lost approximately 77.82% of its overall historic wetlands, which is the highest for this service area and the program as a whole. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 0 acres of wetland loss. Sedge Meadows and Wet to Wet-Mesic Prairie have sustained the greatest estimated historic percentage losses at 100.00% and 97.54% respectively, followed by Floodplain Forests at 64.54%. The overall land use within this watershed is overwhelming agriculture at 79.79% followed by developed at 14.15% leaving only 6.06% natural representing one of the heaviest impacted watershed in the program. The agriculture land use area is comprised of mainly cultivated crops with some pasture/hay area, while the natural land use is comprised of mainly deciduous forest and a small amount of open water, woody wetlands and shrub/scrub. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows with some Floodplain Forests and Wooded Swamps (Hardwood or Coniferous) will fit well within this watershed given the overall agricultural setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie and Ephemeral Pond.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows and Wet to Wet-Mesic Prairies with some Floodplain Forests and Wooded Swamps (Hardwood or Coniferous).
- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie and Ephemeral Pond.

**Grant-Little Maquoketa Rivers****HUC – 07060003**

This watershed has lost approximately 15.44% of its overall historic wetlands, which is the moderate for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 0 acres of wetland loss. Sedge Meadows and Wet to Wet-Mesic Prairie have sustained the greatest estimated historic percentage losses at 95.87% and 93.01% respectively, followed by Wooded Swamps at 54.64% and Floodplain Forests at 21.11%. The overall land use within this watershed is again overwhelming agriculture at 70.96% followed by natural at 23.41% and only 5.63% developed. The agriculture land use area is comprised of mainly cultivated crops with some pasture/hay area, while the natural land use is comprised of mainly deciduous forest, open water, woody wetlands and emergent herbaceous wetlands. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie, Floodplain Forests and Wooded Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Floodplain Forests and Wooded Swamps (Hardwood

or Coniferous) will fit well within this watershed given the overall mix of forested and emergent herbaceous wetlands land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet Mesic Prairies, Floodplain Forests, Wooded Swamps (Hardwood or Coniferous) and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

### **Coon-Yellow Rivers**

**HUC – 07060001**

This watershed has lost approximately 6.22% of its overall historic wetlands, which is the lowest for this service area. Corps permitted actions over the past 5 years depict 0 acres of wetland loss. Estimated Historic loss percentages are somewhat evenly distributed amongst Sedge Meadows, Wet to Wet-Mesic Prairie, Floodplain Forests, Shrub Swamps and Wooded Swamps, with all sustaining significant estimated acreage losses. The overall land use within this watershed is largely split between natural at 54.94% and agriculture at 42.94% followed by a mere 2.12% developed. The natural areas is comprised of deciduous forest, open water, woody wetlands, emergent herbaceous wetlands, grassland/herbaceous and shrub/scrub, while the agriculture land use area is comprised of mainly cultivated crops with some pasture/hay. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairie followed by Floodplain Forests and Wooded Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Shrub Swamps, Floodplain Forests and Wooded Swamps will fit well within this watershed given the overall mix of forested and grassland/herbaceous land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Shrub Swamps (Shrub-Carr or Alder Thicket), Floodplain Forests, Wooded Swamps (Hardwood or Coniferous).
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Existing Advanced Watershed Plans (AWP): None**

### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second,** select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third,** select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

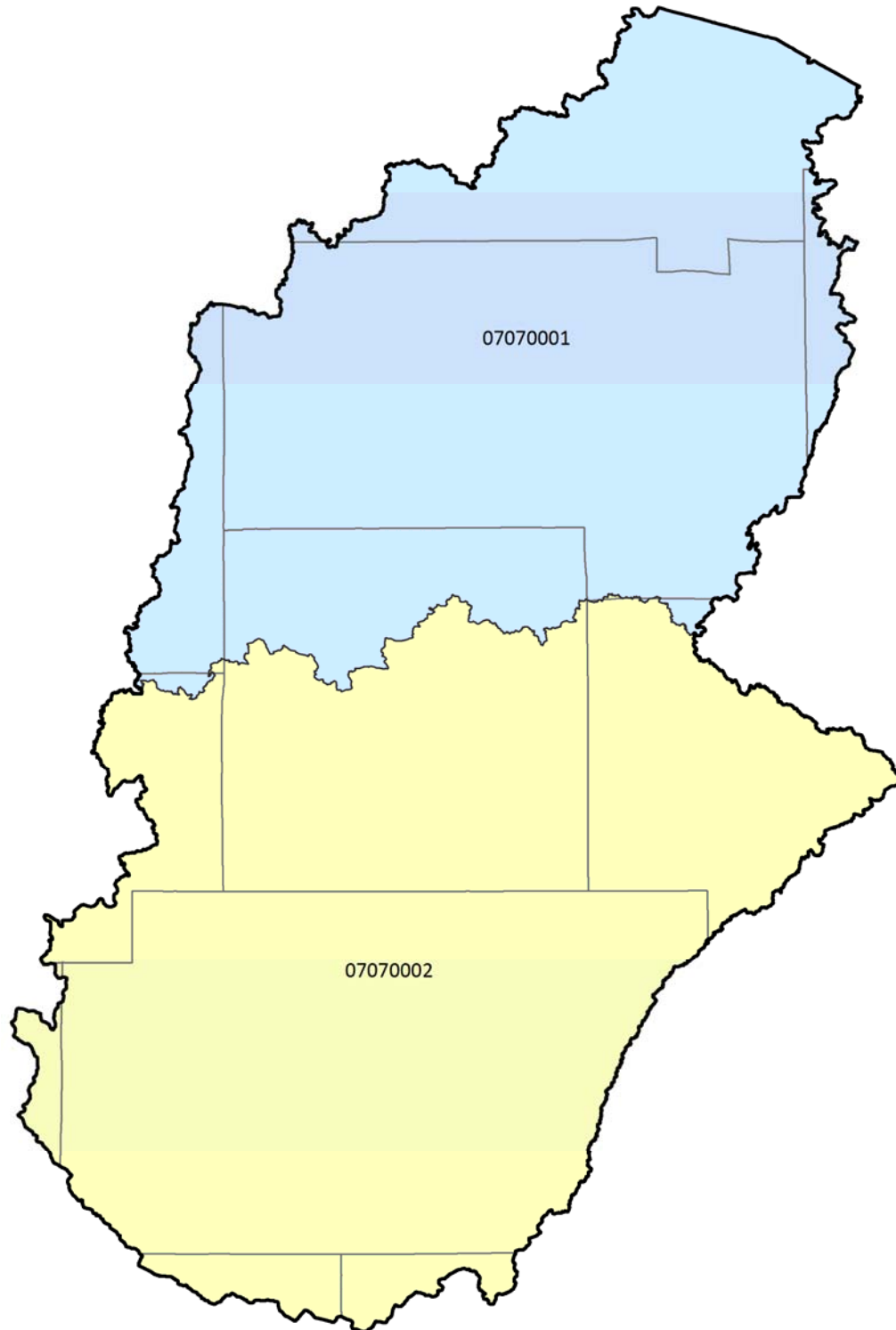
**Fourth,** prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Upper Wisconsin CPF

### Element I. Service area:

#### Overall SA Area with separate HUC-8 watersheds designated in color

(county & state boundaries shown in straight lines for further reference)

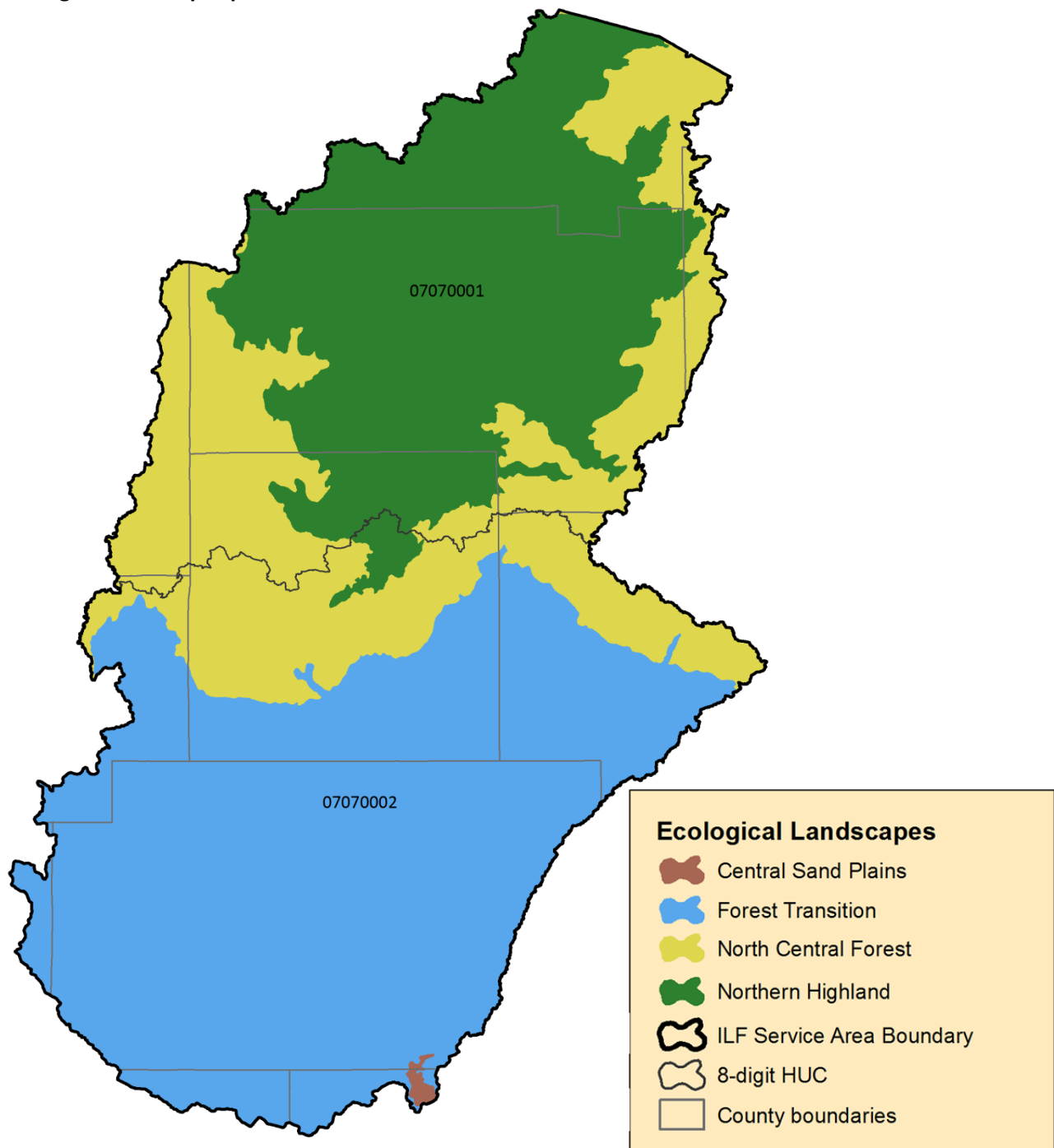


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The Upper Wisconsin Service area is located in the north central portion of Wisconsin comprised of Vilas, Forest, Price, Oneida, Taylor, Lincoln, Langlade, Clark, Marathon, Wood and Portage counties and drains an area approximately 5,608 square miles.

Ecological Landscapes include (WDNR 2012):

**Ecological Landscapes per HUC-8**



**Central Sand Plains** – Typical of southern Wisconsin, mean annual temperature is 43.8 deg. F, mean annual precipitation is 32.8 inches, and mean annual snowfall is 45.0 inches. However, the mean growing season (135 days) is almost 19 days less than other southern Wisconsin ecological landscapes. Summer temperatures can drop below freezing at night in low-lying areas, restricting the distribution of some native plants. The short growing season and summer frosts limit agriculture, especially west of the Wisconsin River where commercially-grown cranberries are an important crop. East of the Wisconsin River the growing season is somewhat longer (by approximately 11 days), with fewer nights of potential summer frost. In this area agriculture is focused primarily on cool season crops such as potatoes, vegetables, and early maturing corn. Center pivot irrigation is widely used to water crops in this region of sandy soils. Grazing is a common land use practice in some areas. An extensive, nearly level expanse of lacustrine and outwash sand that originated from a huge glacial lake characterizes much of the Central Sand Plains. Sand was deposited in Glacial Lake Wisconsin by outwash derived from melting glaciers to the north. Exposures of eroded sandstone bedrock remnants as buttes, mounds and pinnacles are unique to this Ecological Landscape. Sandstone is also exposed as cliffs along the Black River and some of its tributaries. Most soils formed from deep sand deposits of glacial lacustrine or outwash origin or in materials eroded from sandstone hillslopes and sometimes with a surface of wind-deposited (aeolian) sand. These soils are excessively drained, with very rapid permeability, very low available water capacity, and low nutrient status. In lower-lying terrain where silty lacustrine material impedes drainage, the water table is very close to the surface. Such areas are extensive in the western part of the Ecological Landscape, where soils may be poorly drained with surfaces of peat, muck or mucky peat. Thickness of peat deposits ranges from a few inches to more than 15 feet. Large areas of wetlands and a number of generally low-gradient streams that range from small coldwater streams to large warmwater rivers. Major rivers include the Wisconsin, Black, East Fork of the Black, Yellow, and Lemonweir. A number of headwaters streams originate in the extensive peatlands west of the Wisconsin River. Natural lakes are rare, and are limited to riverine floodplains and a few scattered ponds within the bed of extinct Glacial Lake Wisconsin. The hydrology of this Ecological Landscape has been greatly disrupted by past drainage, channelization, impoundment construction, and groundwater withdrawal. The eastern portion of the Central Sand Plains is a mosaic of cropland, managed grasslands and scattered woodlots of pine, oak, and aspen. Many of the historic wetlands in the east were drained early in the 1900s and are now used for agricultural purposes. The western portion of this Ecological Landscape is mostly forest or wetland. Oak, pine, and aspen are the most abundant forest cover types. Plantations of red pine are common in some areas. On wet sites the forests are of two major types: tamarack and black spruce in the peatlands, and bottomland hardwoods in the floodplains of the larger rivers. Many attempts to practice agriculture west of the Wisconsin River failed due to poor soils, poor drainage, and growing season frosts. Population is estimated at 292,119, comprising 5.1% of the state total resulting in a population density of approximately 46 persons/ sq. mile. Approximately one-quarter of the Ecological Landscape is publicly owned, very high for an Ecological Landscape this far south.

**Forest Transition** – Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the "Tension Zone") that runs southeast-northwest across the state. The mean growing season is 133 days, mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The growing

season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. The Forest Transition was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Most soils are non-calcareous, moderately well-drained sandy loams derived from glacial till, but there is considerable diversity in the range of soil attributes. The area includes sandy soils formed in outwash, as well as organic soils, and loam and silt loam soils on moraines. There are many areas with shallow soils. Drainage classes range from poorly drained to excessively drained. Density of the till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition. Soils throughout the Ecological Landscape have silt loam surface deposits formed in aeolian loess, about 6 to 24 inches thick in much of the area. Major river systems draining this Ecological Landscape include the Wolf, Wisconsin, Black, Chippewa, and St. Croix. Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the Ecological Landscape remains heavily forested, the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared), and the west end is a mixture of forest, lakes, and agricultural land. Population is estimated at 639,625, comprising 11.4% of the state total resulting in a population density of approximately 49 persons/ sq. mile. About 88% of all forested land is privately-owned while 12% belongs to the state, counties or municipalities.

**North Central Forest** – Typical of northern Wisconsin, mean growing season in the North Central Forest is 115 days, the shortest growing season of all Ecological Landscapes in the state. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean annual snowfall is 63 inches. However, heavier snowfall can occur closer to Lake Superior, especially in the northwestern part of the Ecological Landscape in the topographically higher Penoque-Gogebic Iron Range. The cool temperatures and short growing season are not conducive to supporting agricultural row crops such as corn in most parts of the Ecological Landscape. Only six percent of the North Central Forest is in agricultural use. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penoque-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands. Rivers, streams, and springs are common and found throughout this Ecological Landscape. Major rivers include the Wisconsin, Chippewa, Flambeau, Jump, Wolf, Pine, Popple, and Peshtigo. Large lakes include Namekagon, Courte Oreilles, Owen, Round, Butternut, North Twin, Metonga, Pelican, Pine, Kentuck, Pickerel, and Lucerne. Several large man-made flowages occur here such as the Chippewa, Turtle-Flambeau, Gile, Pine, and Mondeaux. There are several localized but

significant concentrations of glacial kettle lakes associated with end and recessional moraines (e.g., the Perkestown, Bloomer, Winegar, Birchwood Lakes, and Valhalla/Marenisco Moraines.) In southern Ashland and Bayfield counties, the concentrations of lakes are associated with till plains or outwash over till. Lakes here are due to dense till holding up the water table. Rare lake types in the North Central Forest include marl and meromictic lakes. Forests cover approximately 75% of this Ecological Landscape. The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack), non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marsh (including wild rice marshes) are widespread in the North Central Forest. Population is estimated at 244,782, comprising 4.4% of the state total resulting in a population density of approximately 19 persons/ sq. mile. Forty-two percent is publicly owned, mostly by federal, state or county governments.

**Northern Highland** – Typical of northern Wisconsin, with a mean growing season of 122 days. The mean annual temperature is 39.5 deg. F, the lowest of any Ecological Landscape in the state and almost 2 degrees lower than other northern ecological landscapes. The mean annual precipitation is 31.6 inches, similar to other northern ecological landscapes. The mean annual snowfall is 68.1 inches, the second largest amount of snowfall in the state. Only the Superior Coastal Plain receives more snowfall (87.4 inches). Snowfall varies dramatically within the Northern Highland, with the northern part of the Ecological Landscape being within the outer edge of the lake effect "snowbelt" of Upper Michigan and northwestern Wisconsin. The cool temperatures, short growing season, and sandy soils are not adequate to support agricultural row crops, such as corn. Only about one percent of the Northern Highland is used for agricultural purposes. The climate is favorable for forests, which cover more than 76% of the Ecological Landscape. Most of the Ecological Landscape is an undulating, gently rolling glacial outwash plain with many kettle lakes, wetlands, and bogs. Remnant moraines and drumlins occur often, with their lower slopes covered with outwash sands. Most soils are sands and gravels, some with a loamy mantle. Soil productivity is low compared to glacial till but relatively high for outwash sands. Wetlands are numerous; most have organic soils of peat or muck. There is a globally significant concentration of glacial lakes in the Northern Highland: 4,291 lakes; 1,543 miles of streams, including the headwaters of the Wisconsin and Manitowish-Flambeau-Chippewa river systems. Many lakes are connected by small streams. Rare aquatic species and extensive wetlands (see below) occur here. 48% upland forest, 34% wetlands (both forested and non-forested), 13% open water, 5% grassland and open land, and 1% urban. Population is estimated at 65,660, comprising 1.2% of the state total resulting in a population density of approximately 23 persons/ sq. mile. Thirty percent of the land area and forty-three percent of the forestland in the Ecological Landscape is in public ownership.

This Service area can be further broken down into two smaller HUC-8 watersheds, Lake Dubay (07070002) and the Upper Wisconsin River (07070001). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority

areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

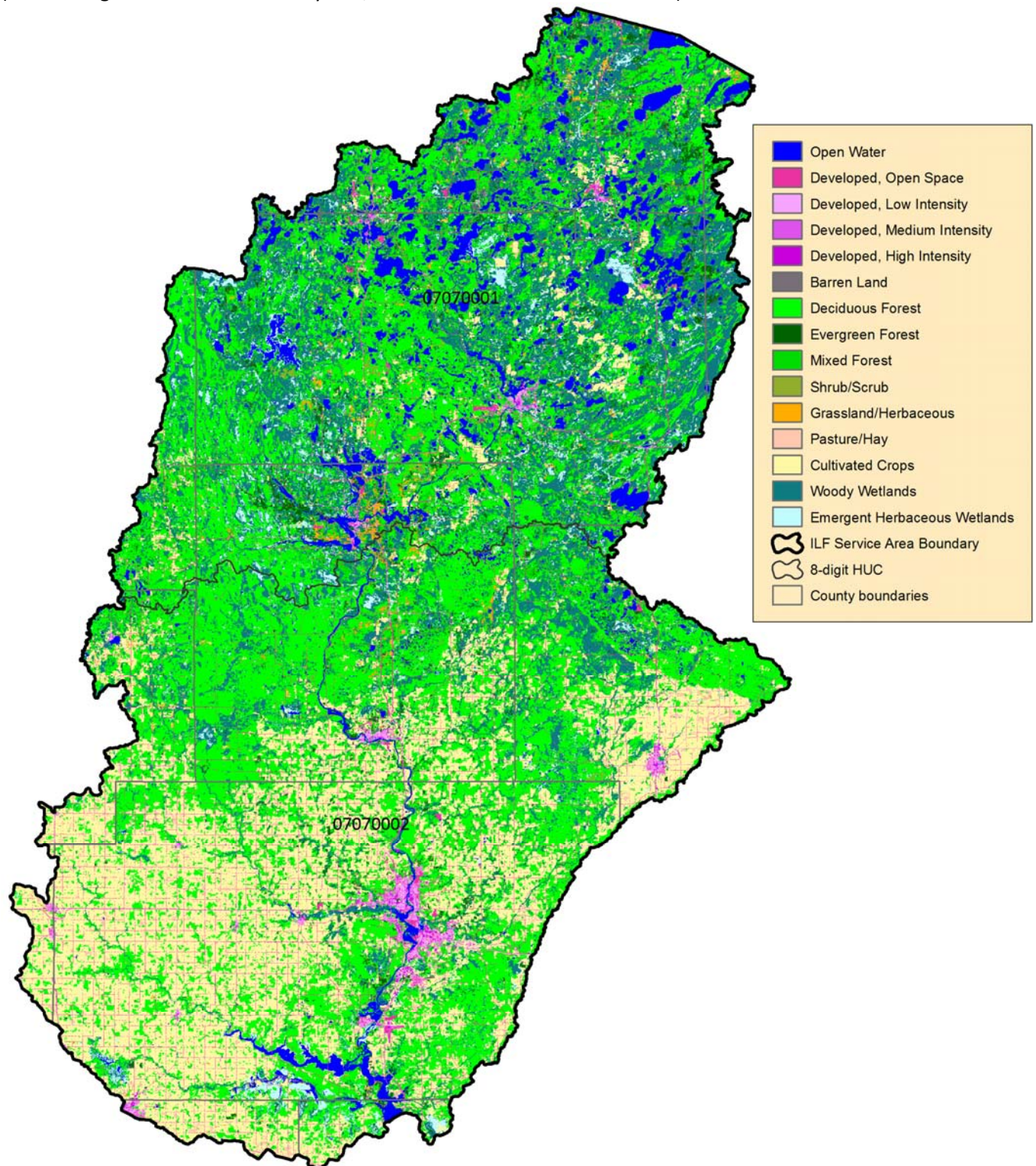
#### **Element II. Threats:**

Overall wetland resource threats within this service area include water quality in the southern areas resulting in 303d listed impaired waters, invasive species in the southern region, fragmentation of corridors and land use changes affecting shorelines. The northern and central portion of this service area (Northern Highland, North Central Forest **WDNR 2012**) have sustained a steady increase in both seasonal and permanent residents, creating a pattern of dispersed urbanization to this largely forested lake area. This has been especially evident along shorelines, where habitat loss has occurred in the littoral zone and on lands adjacent to the shore. Residential development is also increasing in the forests which surround many lakes. Population growth and associated development appear likely to limit some management options in the future, such as the ability to manage at large scales, maintaining ecosystem connectivity, protecting important spawning, nesting, and foraging habitats. Restoration of shoreline habitats and the processes that maintain them will become more difficult over time. Several large industrial forest holdings have changed ownership in recent years. In some cases these properties have been sold to public agencies, but they may also be sold to other industrial owners, real estate developers, or other private entities. When large contiguous ownerships are broken up habitat fragmentation is often one of the results, and this parcelization makes it difficult to meet the desires of all of the new landowners, potentially limiting management options. Development of seasonal and permanent homes, along with roads and other infrastructure to service the residents, has also increased habitat fragmentation and reduced the size of formerly connected habitats. The southern portion of the service area (Forest Transition, Central Sand Plains **WDNR 2012**) contains a larger quantity of agricultural lands with a few concentrated urban centers. This area has lost a large majority of its forests to intensive farming efforts. This southern portion is highly fragmented from a terrestrial standpoint as well as from the effects of dams throughout the area. Impaired waterways listed on the 303d list are also in higher abundance in the southern extent as are flooding events. Invasive species introduced through anthropomorphic pathways are more prevalent in the southern extents of this service area.

The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

**Current Land Use:****Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Land Use Threats (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07070002 - Lake Dubay	1,695,932	60,706	626,578	1,008,648	3.58%	36.95%	59.47%
07070001 - Upper Wisconsin River	1,410,121	103,868	38,047	1,268,206	7.37%	2.70%	89.94%

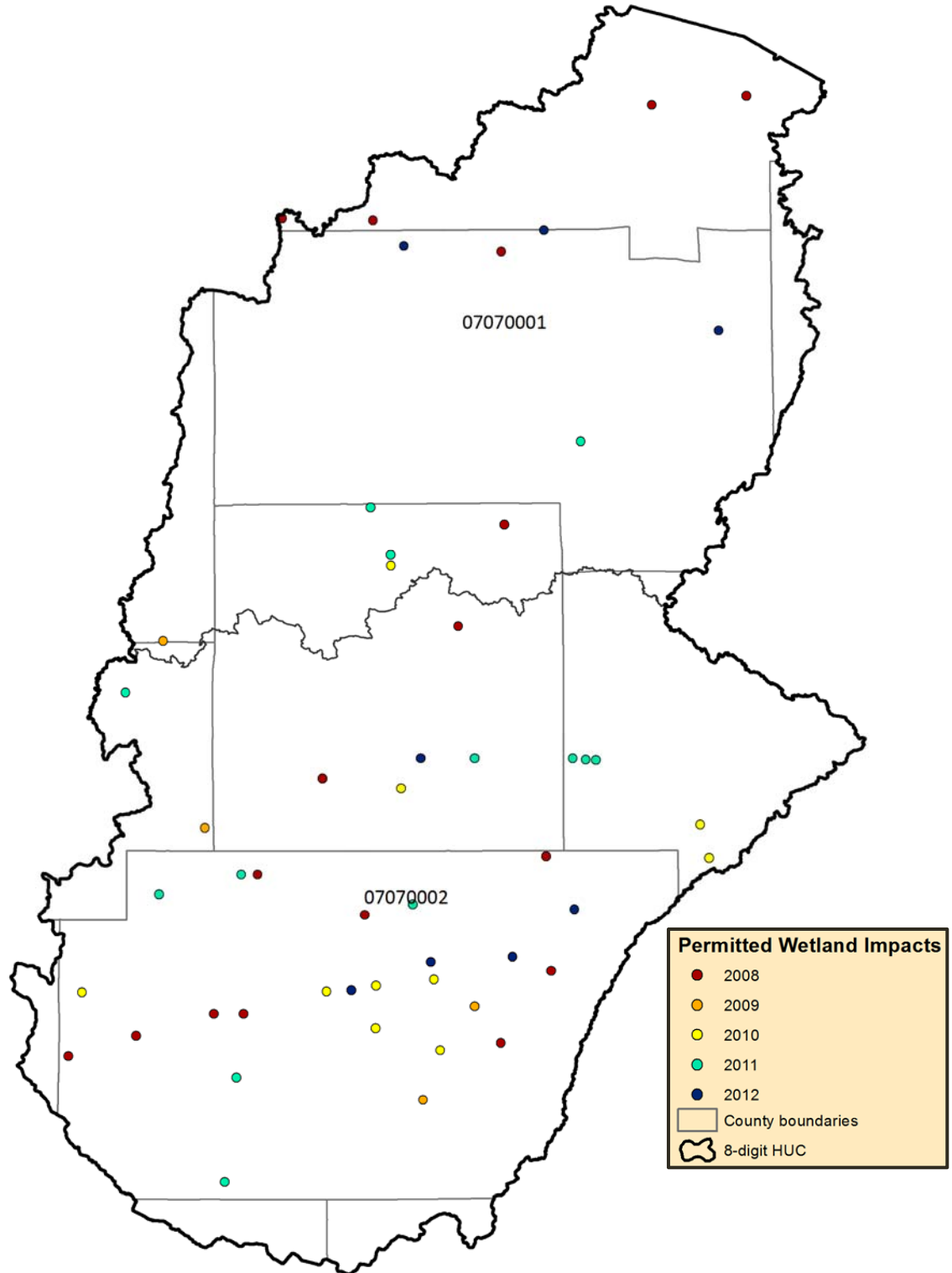
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Lake Dubay HUC-07070002 is under the greatest threat from agriculture with 36.95% of its area containing development based land uses and only 59.47% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07070002 - Lake Dubai	0%	2%	62%	1%	31%	4%	78.759
07070001 - Upper Wisconsin River	0%	15%	53%	0%	0%	31%	1.362

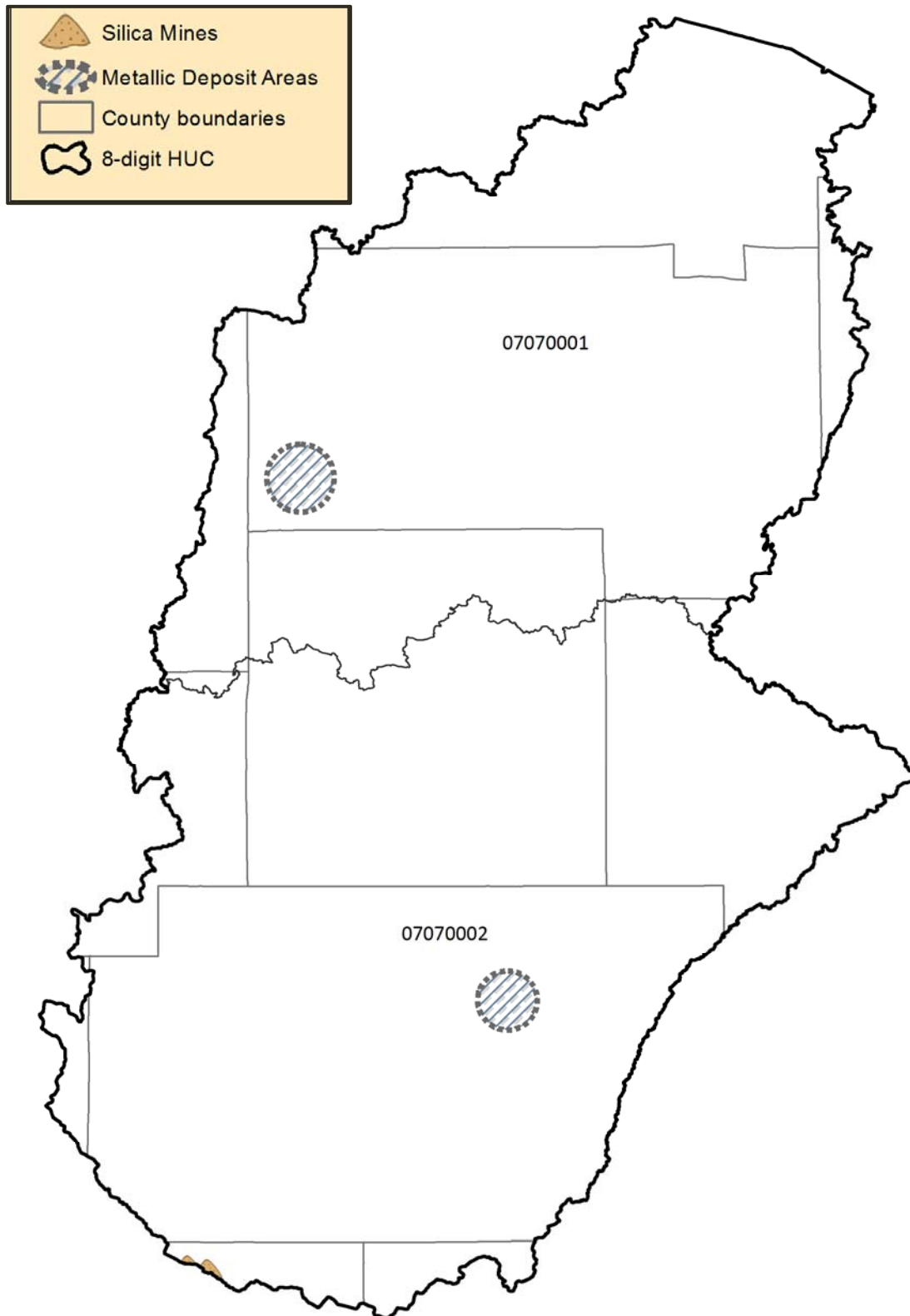
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

While the Upper Wisconsin SA does not intersect with any foreseen non-metallic mining, it does contain the Lynne Deposit, which generally refers to a 5.6 million recoverable ton zinc sulfide ore and the Reef Deposit, which generally refers to an estimated 454,000 ton high grade gold reserve scattered on weathered sulfides and quartz breccias. If developed these deposits would be recovered through open pit mining resulting in large scale potential impacts. The Lynne Deposit falls within the Upper Wisconsin River HUC-07070001 and the Reef Deposit falls within the Lake Dubai HUC-07070002 thus presenting an increased future threat within these watersheds giving them greater priority.

**Potential Mining Impacts per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

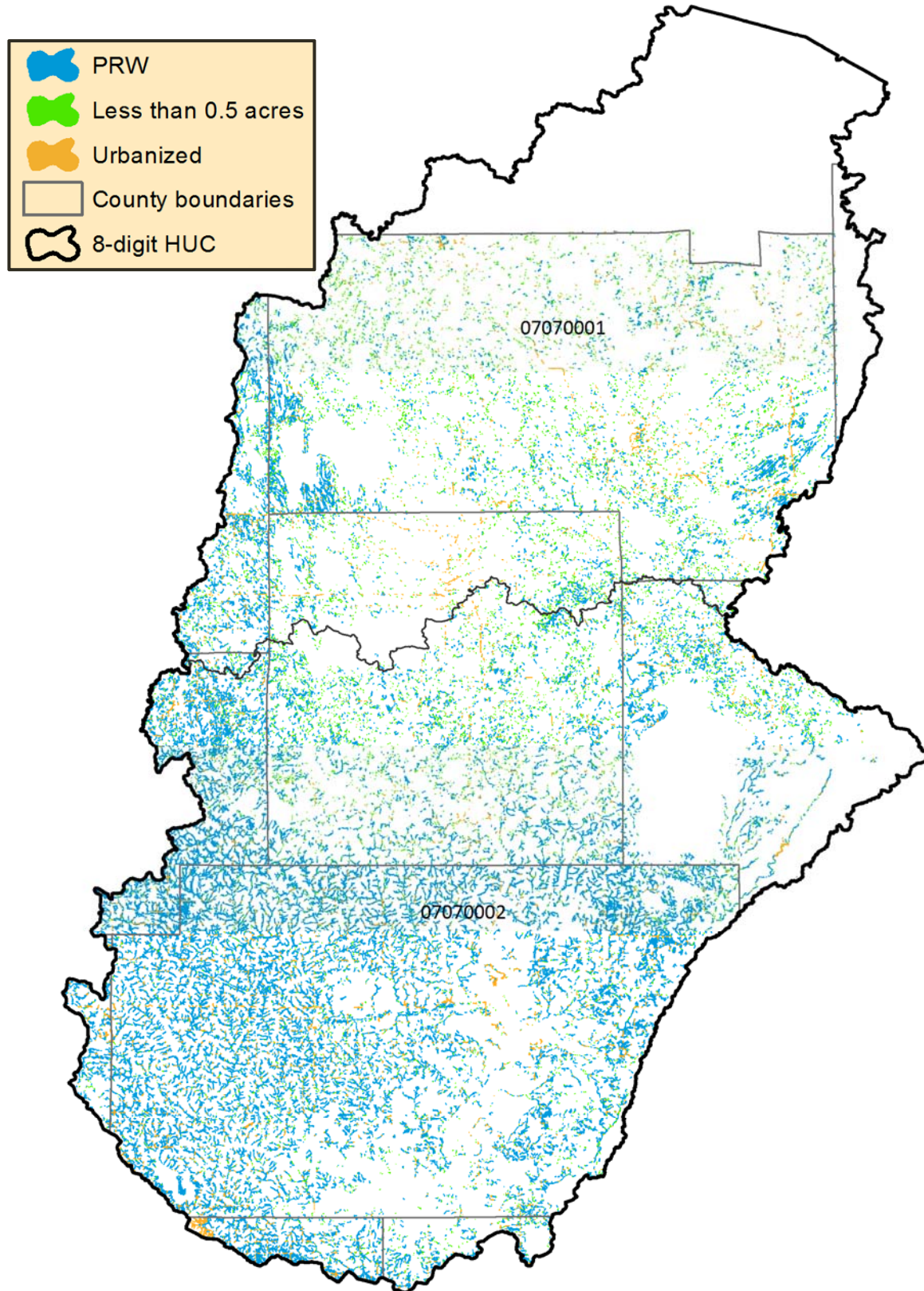


November 12, 2014

**Element III. Historic Loss:**

This watershed like many other of the northern parts of Wisconsin was developed based on the timber and saw mill industry that impacted the wooded wetland vegetation of the area. Dams were also constructed to hold water that could later be used to maintain the river flow to enable logs to be floated downstream. Infrastructure to support the saw mills such as railroads and other means of transportation followed. Saw mills eventually converted to paper mills and settlers and subsequent unique sandy soil based agriculture practices followed suit as lands were cleared and changed the wetland landscape of the area (***WDNR Basin Website 2013***). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



**Overall Estimated Historic Wetland Percent Loss Summary**

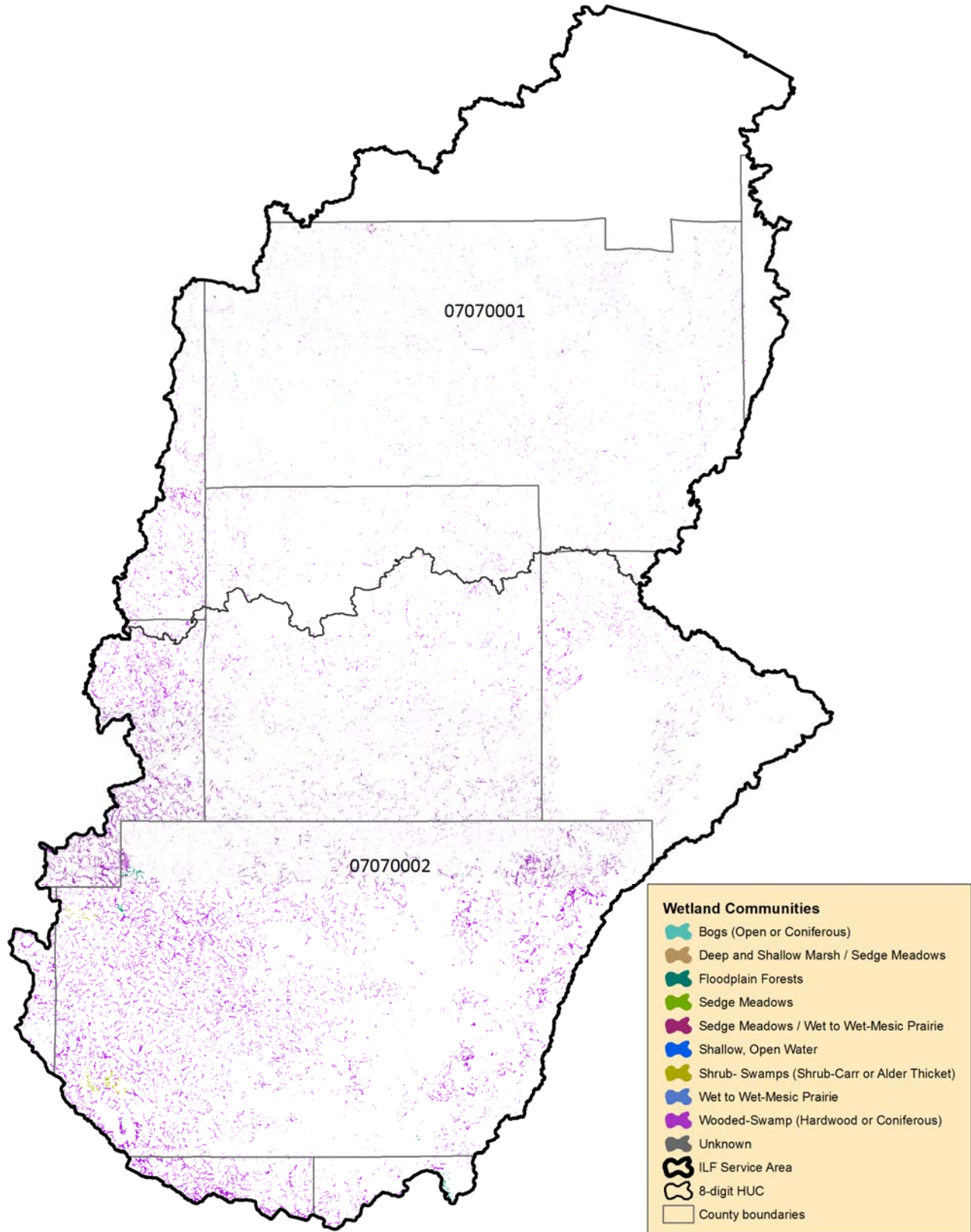
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
07070002 - Lake Dubay	82,164	19.96%
07070001 - Upper Wisconsin River	12,563	5.13%

The map and table above identify that the Lake Dubay HUC-07070002 has sustained the greatest historic loss of wetlands. It should be noted that the Upper Wisconsin River HUC-07070001 contains a portion of Vilas County, which does not currently have digitally available WWI or PRW data affecting it to some degree. Therefore, when establishing the priority HUC-8 watershed to target for mitigation projects greater weight was placed upon the other threats factors such as land use, permit trends and future threats.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
07070002 - Lake Dubay	2.02%	#DIV/0!	34.16%	6.12%	#DIV/0!	9.15%	49.39%	#DIV/0!	#DIV/0!	19.67%
07070001 - Upper Wisconsin River	2.97%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3.29%	7.99%	#DIV/0!	#DIV/0!	3.84%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

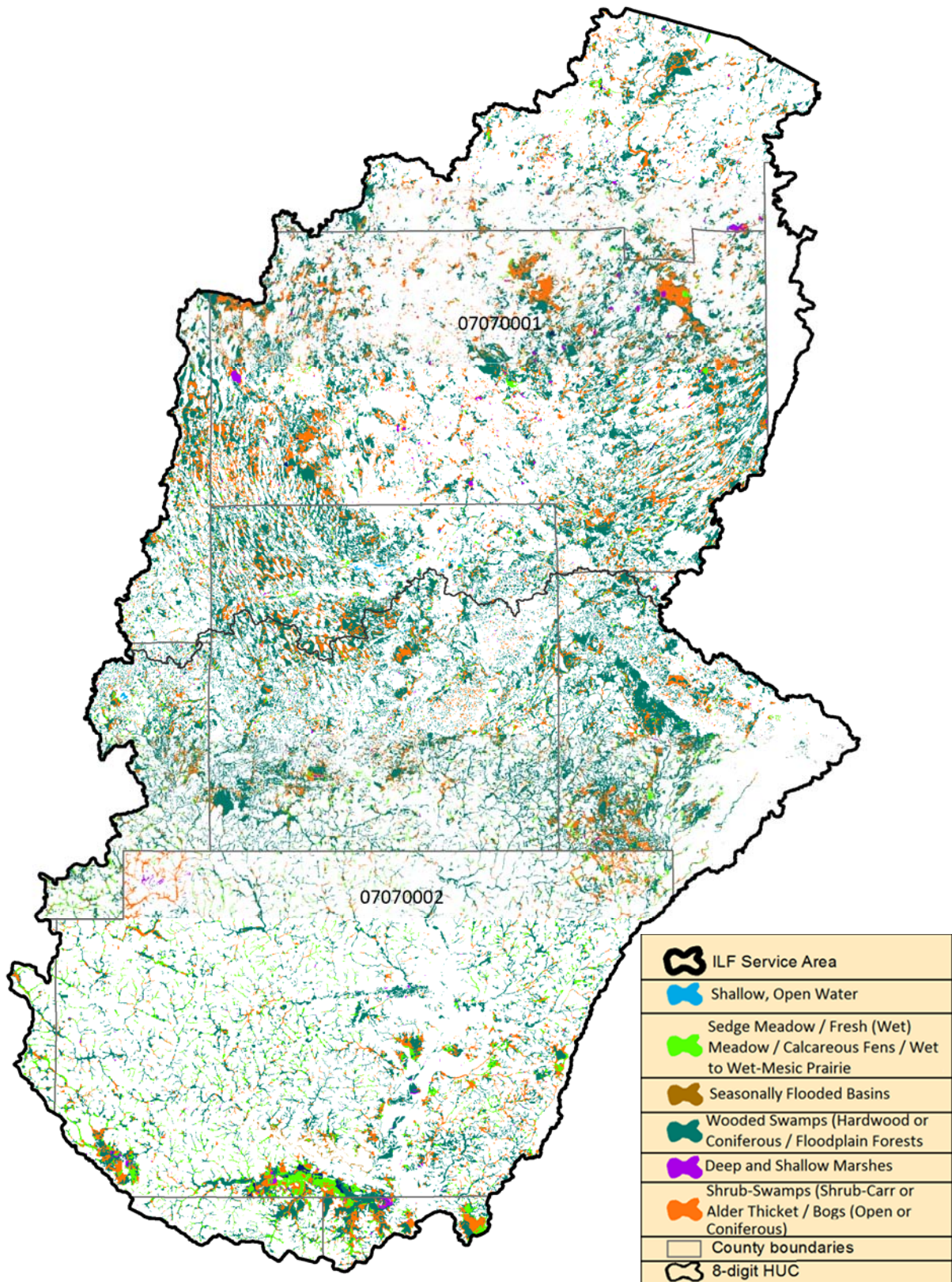
**Element IV. Current Conditions:**

The Upper Wisconsin Watershed was formed when melting glaciers left the area with a very large portion of Wisconsin's open water when compared to most other watershed areas of the state containing 34% of named and unnamed lakes and 22% of the total lake acreage (**WDNR 2002**). Known as a headwaters area this watershed also contains an abundance of streams as well as a significant amount of cold water fisheries. Heavily forested, the wooded wetland areas of this watershed dominate all other types in acreage. Water recreation is by no surprise very active in this area with many people flocking to this area to take part in the many opportunities represented within this watershed. In general this area contains a majority of farm fringe and forested regions of northern Wisconsin, but provides a unique habitat for aquatic dependent species such as bald eagles, osprey, common loons, river otters and colonial nesting water birds. This area also contains a very high density of housing units per square miles, which are largely centered on the many lakes that are found concentrated in the northern regions as development pressures continue to grow (**WDNR Basin Website 2013**).

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07070002 - Lake Dubay	292.73	47,119.01	1,138.07	232,653.45	4,713.10	83,294.16	369,276.40
07070001 - Upper Wisconsin River	781.30	9,273.66	0.00	199,049.35	4,947.59	90,728.10	304,947.32

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07070002 - Lake Dubay	0.08%	12.76%	0.31%	63.00%	1.28%	22.56%	100.00%
07070001 - Upper Wisconsin River	0.26%	3.04%	0.00%	65.27%	1.62%	29.75%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other

important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.

8. Restore, enhance, establish and/or preserve 20 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Lake Dubay****HUC – 07070002**

This watershed has lost approximately 19.96% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depict 78,759 acres of wetland loss. Permit trends show Deep and Shallow Marshes, Wooded Swamps, Floodplain Forests and Shrub Swamps under the greatest pressure from permit impacts. Shrub Swamps, Floodplain Forests and Wooded Swamps have sustained the greatest estimated historic percentage losses at 49.39% and 34.16% respectively, followed by Wooded Swamps at 19.67%. Estimated historic acreage losses further support these wetland type losses and also identify Bogs as having lost a significant estimated quantity of historic acres. The overall land use within this watershed is largely natural at 59.47% followed by agriculture at 36.95% leaving only 3.58% developed. The agriculture land use area is overwhelmingly cultivated crops, while the natural land use is comprised of mainly deciduous forest, mixed forest and woody wetlands. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall forested setting and compatible mapped wetland community dominant types. Forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Northern Sedge Meadow, Ephemeral Pond and Bog (Coniferous or Open).

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Northern Sedge Meadow, Ephemeral Pond and Bog (Coniferous or Open).

**Upper Wisconsin River****HUC – 07070001**

This watershed has lost approximately 5.13% of its overall historic wetlands, which is the lowest for this service area. Corps permitted actions over the past 5 years depicts 1,362 acres of wetland loss, which is again the lowest for this service area. Permit trends show Deep and Shallow Marshes, Shrub Swamps and Shallow Open Water as the types being lost these small quantity permit actions. While historic losses are generally low for this watershed, Shrub Swamps and Wooded Swamps have sustained the greatest estimated historic percentage losses at 7.99% and 3.84% respectively with Bogs losing a significant quantity of estimated acreage. The overall land use within this watershed is overwhelming natural at 89.94% followed by developed at 7.37% leaving only 2.70% agriculture. The natural land use area is comprised of mainly deciduous and mixed forest, woody wetlands, open water and emergent herbaceous wetlands, while the agriculture land use is comprised of some cultivated crops. Current

mapped wetlands are dominated by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall forested setting and compatible mapped wetland community dominant types. Forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bog (Coniferous or Open).

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Bog (Coniferous or Open).

**Existing Advanced Watershed Plans (AWP): None**

**Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

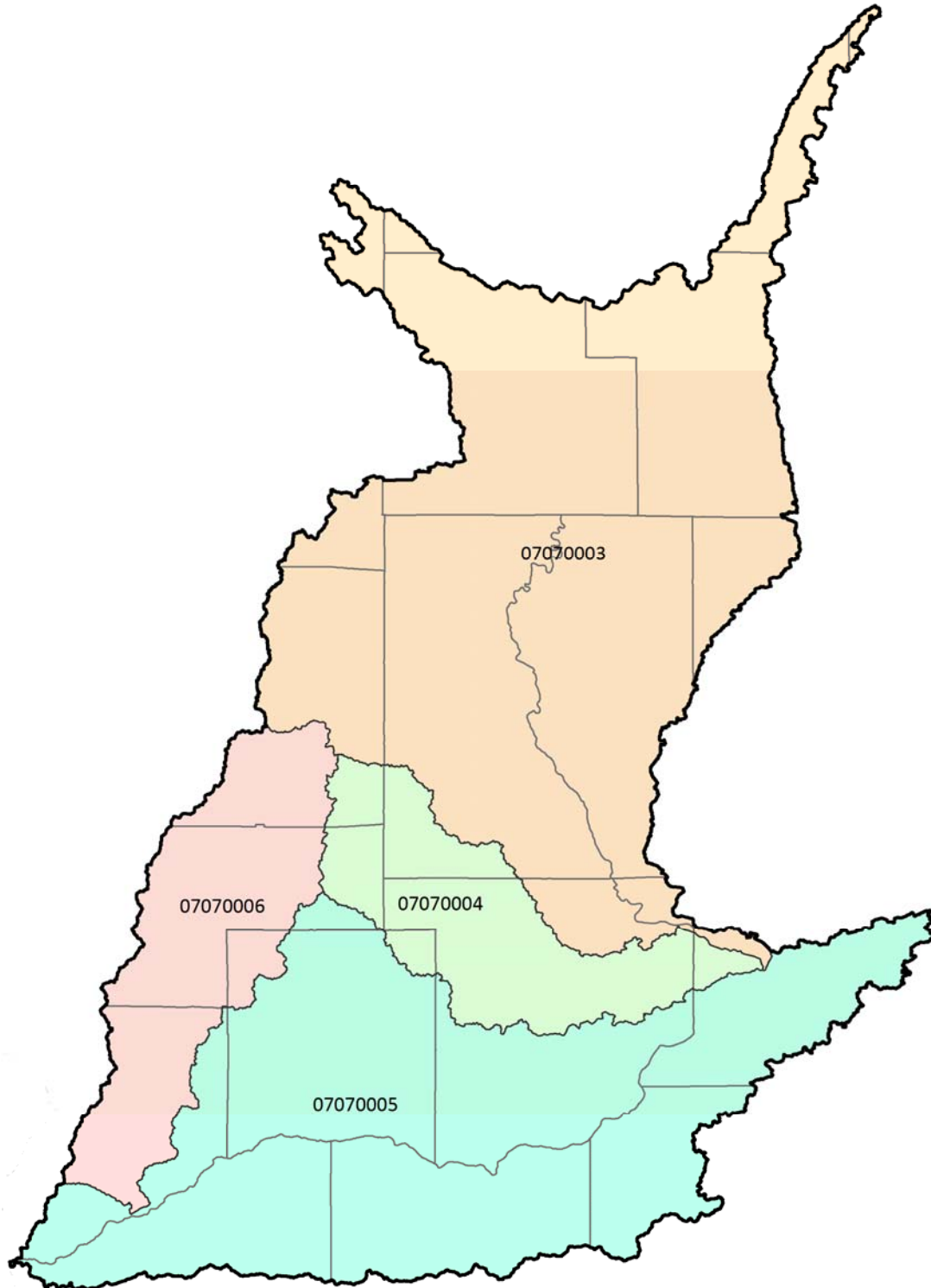
**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

**Lower Wisconsin CPF****Element I. Service area:****Overall SA Area with separate HUC-8 watersheds designated in color**

(county & state boundaries shown in straight lines for further reference)

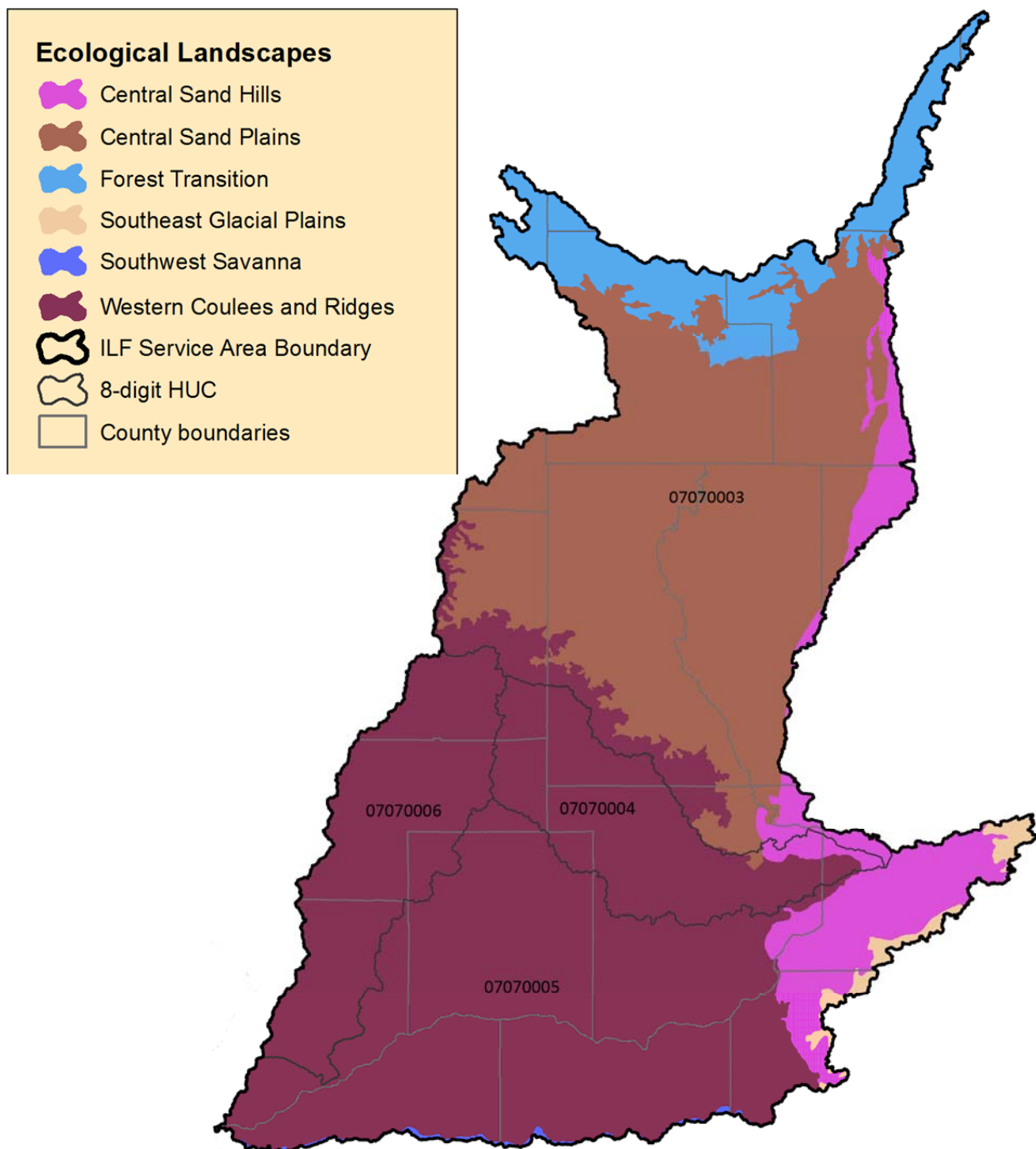


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The Lower Wisconsin Service area is located in the south central portion of Wisconsin comprised of Clark, Marathon, Langlade, Jackson, Wood, Portage, Monroe, Juneau, Adams, Waushara, Vernon, Crawford, Richland, Sauk, Columbia, Grant, Iowa and Dane counties and drains an area approximately 7,049 square miles.

Ecological Landscapes include (WDNR 2012):

#### Ecological Landscapes per HUC-8



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**Central Sand Hills** – Typical of south central Wisconsin; mean growing season of 144 days, mean annual temperature is 44.8 deg. F, average January minimum temperature is 4deg. F, average August maximum temperature is 81deg. F, mean annual precipitation is 33 inches, mean annual snowfall is 44 inches. Although the climate is suitable for agricultural row crops, small grains, and pastures, the sandy soils somewhat limit agricultural potential. The landforms in this Ecological Landscape include a series of glacial moraines (the Johnstown Moraine is the terminal moraine of the Green Bay lobe; the Arnott Moraine is older, and has more subdued topography. Pitted outwash is extensive in some areas. Glacial tunnel channels occur here, e.g., in Waushara County, just east of and visible from I-39. Soils are primarily sands. Organic soils underlie wetlands such as tamarack swamps and sedge meadows. Muck farming still occurs in some areas. Mosaic of extensive wetlands and small kettle lakes in the outwash areas, and the headwaters of coldwater streams originating in glacial moraines. Some seepage lakes and ponds exhibit dramatic natural water level fluctuations which create important Inland Beach and Coastal Plain Marsh habitats. The Wisconsin River and a short but ecologically important stretch of the lower Baraboo River flow through this Ecological Landscape. Other important rivers include the Fox, Grand, Mecedun, Montello, Puchyan, and White. Large impoundments occur on the Wisconsin (Lake Wisconsin), Fox (Buffalo and Puckaway lakes) and Grand (Grand River Marsh) rivers. Current vegetation is more than one-third agricultural crops, one third forest, and almost 20% grasslands with smaller amounts of open wetland, open water, shrubs, unvegetated (termed "barren" in WISCLAND), and urban areas. Large contiguous areas of any of the major natural or surrogate vegetation types are uncommon. Population is estimated at 182,035, comprising 3.2% of the state total resulting in a population density of approximately 59 persons/ sq. mile. Scattered Federal Waterfowl Production Areas, Fox River National Wildlife Refuge, scattered state-owned and managed lands, including Hartman Creek State Park, several State Wildlife Areas, Fisheries Areas, and Natural Areas.

**Central Sand Plains** – Typical of southern Wisconsin, mean annual temperature is 43.8 deg. F, mean annual precipitation is 32.8 inches, and mean annual snowfall is 45.0 inches. However, the mean growing season (135 days) is almost 19 days less than other southern Wisconsin ecological landscapes. Summer temperatures can drop below freezing at night in low-lying areas, restricting the distribution of some native plants. The short growing season and summer frosts limit agriculture, especially west of the Wisconsin River where commercially-grown cranberries are an important crop. East of the Wisconsin River the growing season is somewhat longer (by approximately 11 days), with fewer nights of potential summer frost. In this area agriculture is focused primarily on cool season crops such as potatoes, vegetables, and early maturing corn. Center pivot irrigation is widely used to water crops in this region of sandy soils. Grazing is a common land use practice in some areas. An extensive, nearly level expanse of lacustrine and outwash sand that originated from a huge glacial lake characterizes much of the Central Sand Plains. Sand was deposited in Glacial Lake Wisconsin by outwash derived from melting glaciers to the north. Exposures of eroded sandstone bedrock remnants as buttes, mounds and pinnacles are unique to this Ecological Landscape. Sandstone is also exposed as cliffs along the Black River and some of its tributaries. Most soils formed from deep sand deposits of glacial lacustrine or outwash origin or in materials eroded from sandstone hillslopes and sometimes with a surface of wind-

deposited (aeolian) sand. These soils are excessively drained, with very rapid permeability, very low available water capacity, and low nutrient status. In lower-lying terrain where silty lacustrine material impedes drainage, the water table is very close to the surface. Such areas are extensive in the western part of the Ecological Landscape, where soils may be poorly drained with surfaces of peat, muck or mucky peat. Thickness of peat deposits ranges from a few inches to more than 15 feet. Large areas of wetlands and a number of generally low-gradient streams that range from small coldwater streams to large warmwater rivers. Major rivers include the Wisconsin, Black, East Fork of the Black, Yellow, and Lemonweir. A number of headwaters streams originate in the extensive peatlands west of the Wisconsin River. Natural lakes are rare, and are limited to riverine floodplains and a few scattered ponds within the bed of extinct Glacial Lake Wisconsin. The hydrology of this Ecological Landscape has been greatly disrupted by past drainage, channelization, impoundment construction, and groundwater withdrawal. The eastern portion of the Central Sand Plains is a mosaic of cropland, managed grasslands and scattered woodlots of pine, oak, and aspen. Many of the historic wetlands in the east were drained early in the 1900s and are now used for agricultural purposes. The western portion of this Ecological Landscape is mostly forest or wetland. Oak, pine, and aspen are the most abundant forest cover types. Plantations of red pine are common in some areas. On wet sites the forests are of two major types: tamarack and black spruce in the peatlands, and bottomland hardwoods in the floodplains of the larger rivers. Many attempts to practice agriculture west of the Wisconsin River failed due to poor soils, poor drainage, and growing season frosts. Population is estimated at 292,119, comprising 5.1% of the state total resulting in a population density of approximately 46 persons/ sq. mile. Approximately one-quarter of the Ecological Landscape is publicly owned, very high for an Ecological Landscape this far south.

**Forest Transition** – Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the "Tension Zone") that runs southeast-northwest across the state. The mean growing season is 133 days, mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The growing season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. The Forest Transition was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Most soils are non-calcareous, moderately well-drained sandy loams derived from glacial till, but there is considerable diversity in the range of soil attributes. The area includes sandy soils formed in outwash, as well as organic soils, and loam and silt loam soils on moraines. There are many areas with shallow soils. Drainage classes range from poorly drained to excessively drained. Density of the till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition. Soils throughout the Ecological Landscape have silt loam surface deposits formed in aeolian loess, about 6 to 24 inches thick in much of the area. Major river systems draining this Ecological Landscape include the Wolf, Wisconsin, Black, Chippewa, and St. Croix. Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the Ecological Landscape

remains heavily forested, the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared), and the west end is a mixture of forest, lakes, and agricultural land. Population is estimated at 639,625, comprising 11.4% of the state total resulting in a population density of approximately 49 persons/ sq. mile. About 88% of all forested land is privately-owned while 12% belongs to the state, counties or municipalities.

**Southeast Glacial Plains** – Typical of southern Wisconsin; mean growing season of 155 days, mean annual temperature is 45.9 deg. F, mean annual precipitation is 33.6 inches, and mean annual snowfall is 39.4 inches. The climate is suitable for agricultural row crops, small grains, and pastures, which are prevalent in this Ecological Landscape. The dominant landforms are glacial till plains and moraines composed mostly of materials deposited during the Wisconsin Ice Age, but the southwestern part of the Ecological Landscape consists of older, pre-Wisconsin till and the topography is more dissected. Other glacial landforms, including drumlins, outwash plains, eskers, kames and kettles are also well-represented kames, eskers, and kettles. The "Kettle Moraine" is an area of rough topography on the eastern side of the Southeast Glacial Plains that marks the areas of contact between the Green Bay and Lake Michigan glacial lobes. Numerous excellent examples of glacial features occur and are highly visible in the Kettle Moraine. Soils are derived from lime-rich tills overlain in most areas by a silt-loam loess cap. The Southeast Glacial Plains has the highest aquatic productivity for plants, insects, other invertebrates, and fish of any Ecological Landscape in the state. Significant river systems include the Wolf, Bark, Rock, Fox, Milwaukee, Sugar, Mukwonago, and Sheboygan. Most riparian zones have been degraded. Several clusters of large lakes exist, including the Yahara chain of lakes in and around Madison, and the Lake Winnebago Pool system. Kettle lakes occur within end moraines, in outwash channels, and in ancient riverbeds. This Ecological Landscape contains some huge marshes, as well as fens, sedge meadows, wet prairies, tamarack swamps, and floodplain forests. Many wetlands here have been affected by hydrologic modifications (ditching, diking, tiling), grazing, infestations of invasive plants, and excessive inputs of sediment- and nutrient-laden runoff from croplands. Primarily agricultural cropland (58% of Landscape). Remaining forests occupy only 11% of the land area and major cover types include maple-basswood, oak, lowland hardwoods, and conifer swamps (mostly tamarack-dominated). No large areas of upland forest exist except on the Kettle Interlobate Moraine, where the topography is too rugged to practice intensive agriculture and the soils are not always conducive to high crop productivity. Wetlands are extensive (12% of Landscape, 593,248 acres) and include large marshes and sedge meadows, and extensive forested lowlands within the Lower Wolf River floodplain. Forested lowlands are also significant along stretches of the Milwaukee, Sugar, and Rock rivers. Population is estimated at 1,519,000, comprising 28.5% of the state total resulting in a population density of approximately 204 persons/ sq. mile. Only four percent of the Southeast Glacial Plains is in public ownership (226,230 acres), of which 58% is wetland and 42% is upland.

**Very small fringe of Southwest Savanna at the southern tip** – Typical of southern Wisconsin; the mean growing season is 153 days, mean annual temperature is 45.6 deg. F, mean annual precipitation is 35.2, and mean annual snowfall is 39.9 inches. However, the Southwest Savanna has the fourth longest growing season, the most precipitation, the third lowest snowfall, and second warmest January low temperature among Ecological Landscapes in the state. The climate tends to be warmer in the

southwestern part of the state, which affects the ecology of the Southwest Savanna and also makes it suitable for most agricultural uses. 80% of this Ecological Landscape is devoted to row crops, small grains, and pastures. The Southwest Savanna is part of Wisconsin's Driftless Area, a region that has not been glaciated for at least the last 2.4 million years. The topography is characterized by broad, open ridgetops, deep valleys, and steep, wooded slopes. Soils on hilltops are silt loams mostly silt loams. In some areas soils are shallow, with bedrock or stony red clay subsoil very close to or at the surface. In other locales the ridgetops have a deep cap of loess-derived silt loam (these are the most productive agricultural soils). Valley soils include alluvial sands, loams, and occasionally, peats. The drainage patterns of streams in the Southwest Savanna are dendritic, which is a pattern characteristic of unglaciated regions but absent or uncommon in most of Wisconsin. Flowing waters include warmwater rivers and streams, coldwater streams, and springs. Natural Lakes are virtually absent, though there are a few associated with the floodplains of the larger rivers. Natural lakes are rare but there are a few in the floodplains of the larger rivers, such as the Pecatonica. Impoundments and reservoirs have been constructed on some rivers and streams, and check dams have been built in ravines to hold storm and snow runoff. Agricultural crops (corn, soybeans, small grains, hay) cover 70% of this Ecological Landscape, with lesser amounts of grassland (mostly pasture), forest, and residential areas. The major forest types are oak-hickory and maple-basswood. Prairie remnants of varying quality persist in a few places, mostly on rocky hilltops or slopes that are too steep to farm. Some pastures have never been plowed, and those that historically supported prairie may retain remnants of the former prairie flora. Pastures with scattered open-grown oaks still exist in some areas, mimicking oak savanna structure. A complement of native plants persists in some of these pastured savannas. Population is estimated at 123,899, comprising 2.2% of the state total resulting in a population density of approximately 39 persons/ sq. mile. About 96.5% of the land in the Southwest Savanna is privately owned while 3.5% belongs to state, county, or municipal governments.

**Western Coulee & Ridges** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 43 inches. Because it extends over a considerable latitudinal area, the climate varies from north to south. The climate is favorable for agriculture, but steep slopes limit intensive agricultural uses to broad ridgetops and parts of valleys above floodplains. The climate variability, along with the rugged ridge and coulee (valley) topography, numerous microhabitats, and large rivers with broad, complex floodplains, allows for a high diversity of plants and animals. Characterized by its highly eroded, unglaciated topography with steep sided valleys and ridges, high gradient headwaters streams, and large rivers with extensive, complex floodplains and terraces. Ancient sand dunes occur on some of the broader terraces along the Mississippi and Wisconsin rivers. Windblown loess of varying thickness; alluvium in the floodplains. Organic soils, especially peats, are rare. Dendritic drainage patterns are well-developed in this mostly unglaciated Ecological Landscape. Natural lakes are restricted to the floodplains of large rivers. Large warmwater rivers are especially important here, and include the Wisconsin, Chippewa, and Black. The Mississippi River forms the Ecological Landscape's western boundary. Numerous spring-fed (coldwater) headwaters streams occur here. Coolwater streams are also common. Current vegetation is a mix of forest (41%), agriculture (36%), and grassland (14%) with wetlands (5%) mostly in the river valleys. Primary forest cover is oak-hickory (51%). Maple-basswood forests (28%), dominated by sugar

maple, basswood and red maple, are common in areas that were not burned frequently. Bottomland hardwoods (10%) dominated by silver maple, swamp white oak, river birch, ashes, elms, and cottonwood are common within the floodplains of the larger rivers. Relict "northern" mesic conifer forests composed of hemlock, white pine and associated hardwoods such as yellow birch are rare but do occur in areas with cool, moist microclimates. Dry rocky bluffs may support xeric stands of native white pine, sometimes mixed with red or even jack pine. Prairies are now restricted to steep south- or west-facing bluffs, unplowed outwash terraces along the large rivers, and a few other sites. They occupy far less than 1% of the current landscape. Mesic tallgrass prairies are now virtually nonexistent except as very small remnants along rights-of-way or in cemeteries. Population is estimated at 614,553, comprising 10.8% of the state total resulting in a population density of approximately 54 persons/ sq. mile. Public ownership in this Ecological Landscape is limited (only about 3%) and much of it is associated with the large rivers (i.e. Mississippi, Wisconsin, Chippewa and Black rivers).

This Service area can be further broken down into four smaller HUC-8 watersheds, the Baraboo River (07070004), Kickapoo River (07070006), Lower Wisconsin River (07070005) and the Castle-Rock (07070003). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

#### **Element II. Threats:**

Overall wetland resource threats within this service area include groundwater depletion from high capacity withdrawals in the northeast, central and along the Wisconsin River corridor, water quality throughout resulting in 303d listed impaired waters, invasive species along the western and eastern border areas, fragmentation of corridors, flooding in the southern areas and land use changes. The northern portion of this service area (Forest Transition **WDNR 2012**) has lost a significant amount of its forested landscape and exists in a highly fragmented state. The central region (Central Sand Plains, Central Sand Hills **WDNR 2012**) is under increased pressure from groundwater withdrawals in this sandy, high ground water region threatening to reduce hydrology and posing contamination concerns. Invasive species are present in high concentrations on the eastern and western extents of this region threatening natural communities. The southern lands of this service area (Western Coulee and Ridges, Southeast Glacial Plains, Southwest Savanna **WDNR 2012**) are also largely fragmented and subject to major dams constructed on the Wisconsin River that alter and further divide aquatic habitats. Terrace based development activities and overall agriculture pressure impacts wetland hydrology, vegetation cover, creates pathways for invasive species and adversely impacts resources.

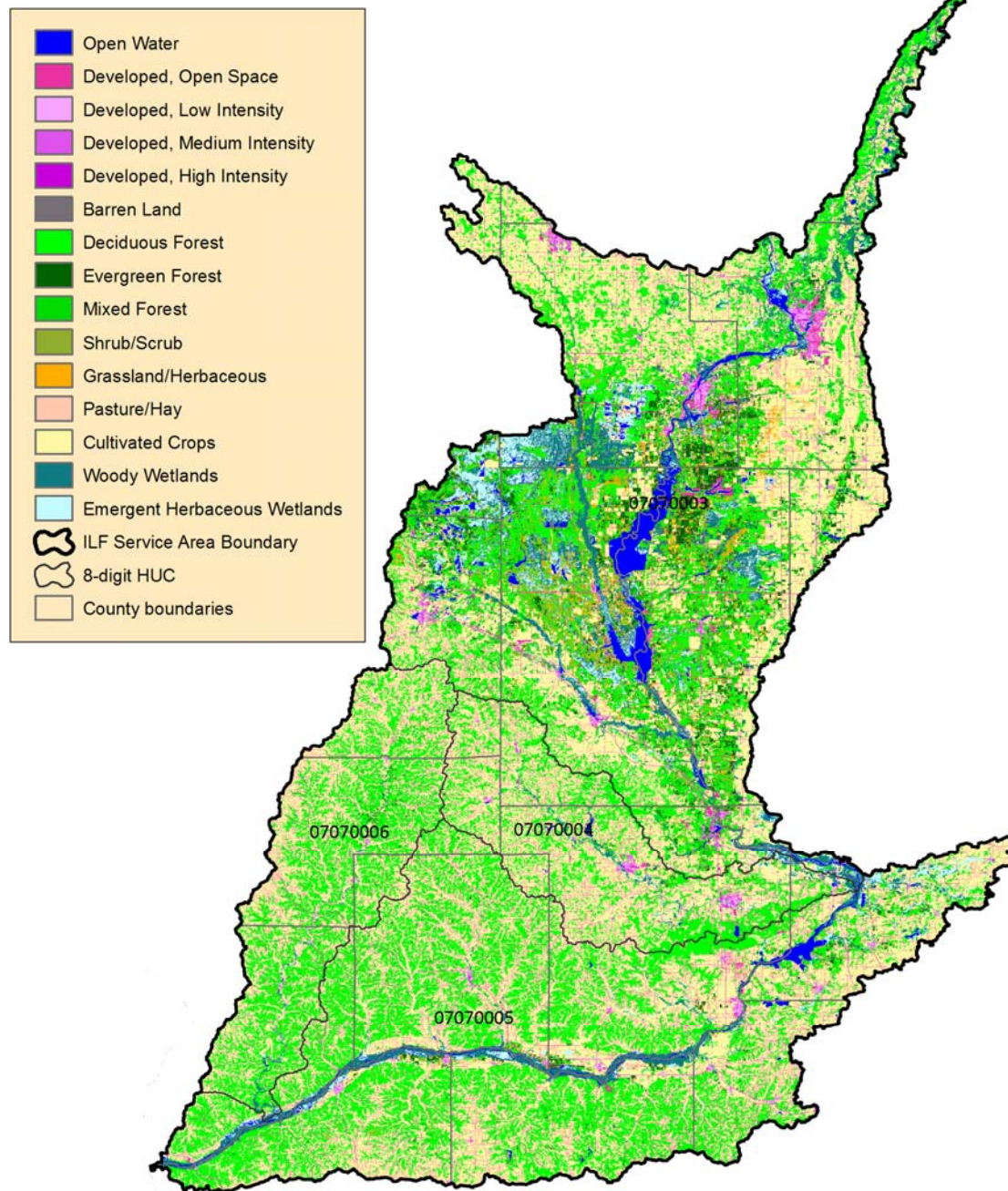
The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed

and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

**Current Land Use:**

**Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**

(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07070004 - Baraboo River	543,326	151,752	244,177	147,397	27.93%	44.94%	27.13%
07070006 - Kickapoo River	494,573	27,520	234,495	232,558	5.56%	47.41%	47.02%
07070005 - Lower Wisconsin River	1,510,102	80,301	708,369	721,432	5.32%	46.91%	47.77%
07070003 - Castle-Rock	1,950,172	23,947	747,866	1,178,359	1.23%	38.35%	60.42%

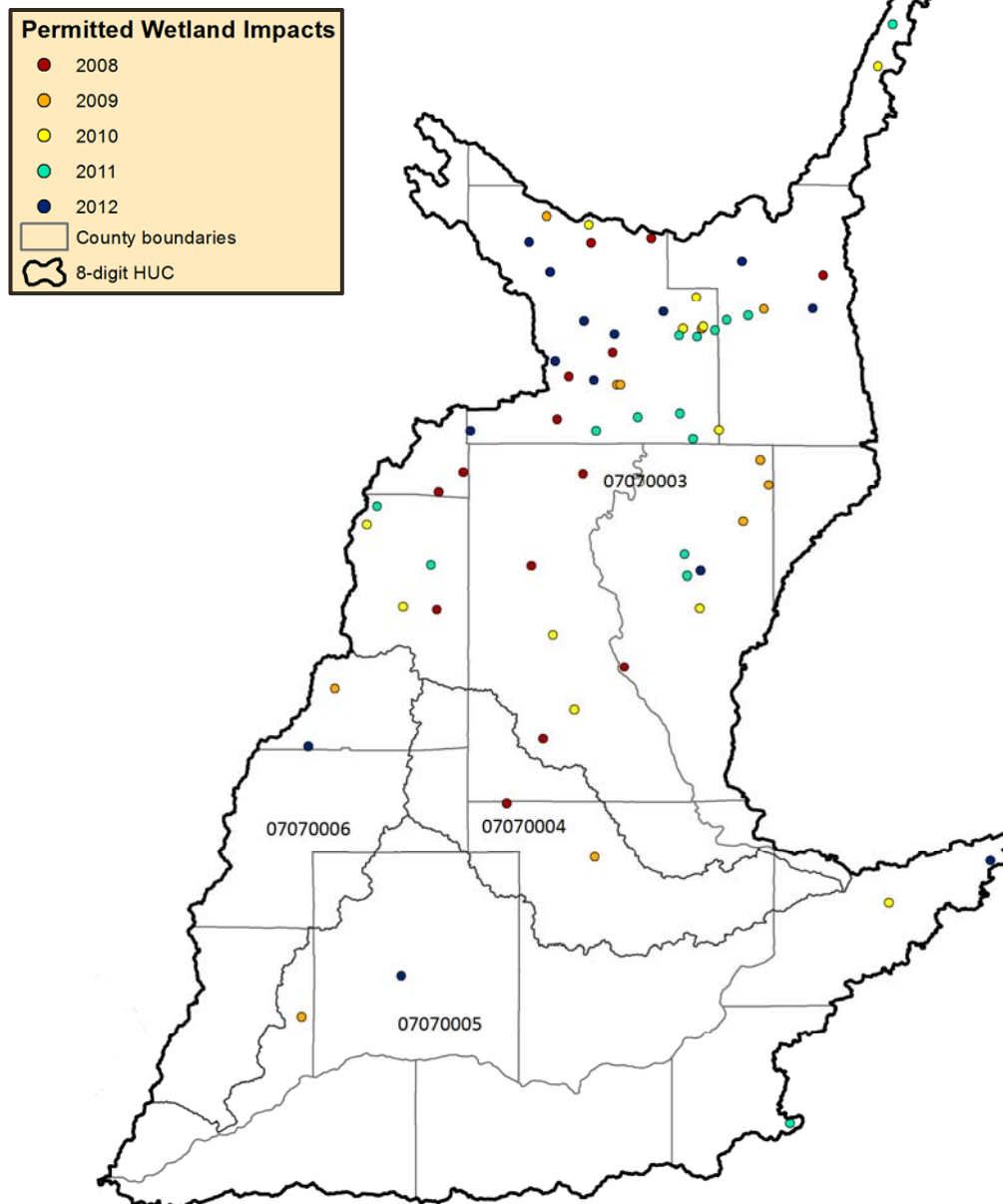
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Baraboo River HUC-07070004 is under the greatest threat from both agriculture (44.94% land use) and development (27.93% land use) with only 27.13% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07070003 - Castle-Rock	17%	5%	43%	32%	2%	1%	46,247
07070005 - Lower Wisconsin River	24%	0%	76%	0%	0%	0%	2,546
07070006 - Kickapoo River	4%	0%	96%	0%	0%	0%	2.41
07070004 - Baraboo River	64%	0%	0%	36%	0%	0%	0.451

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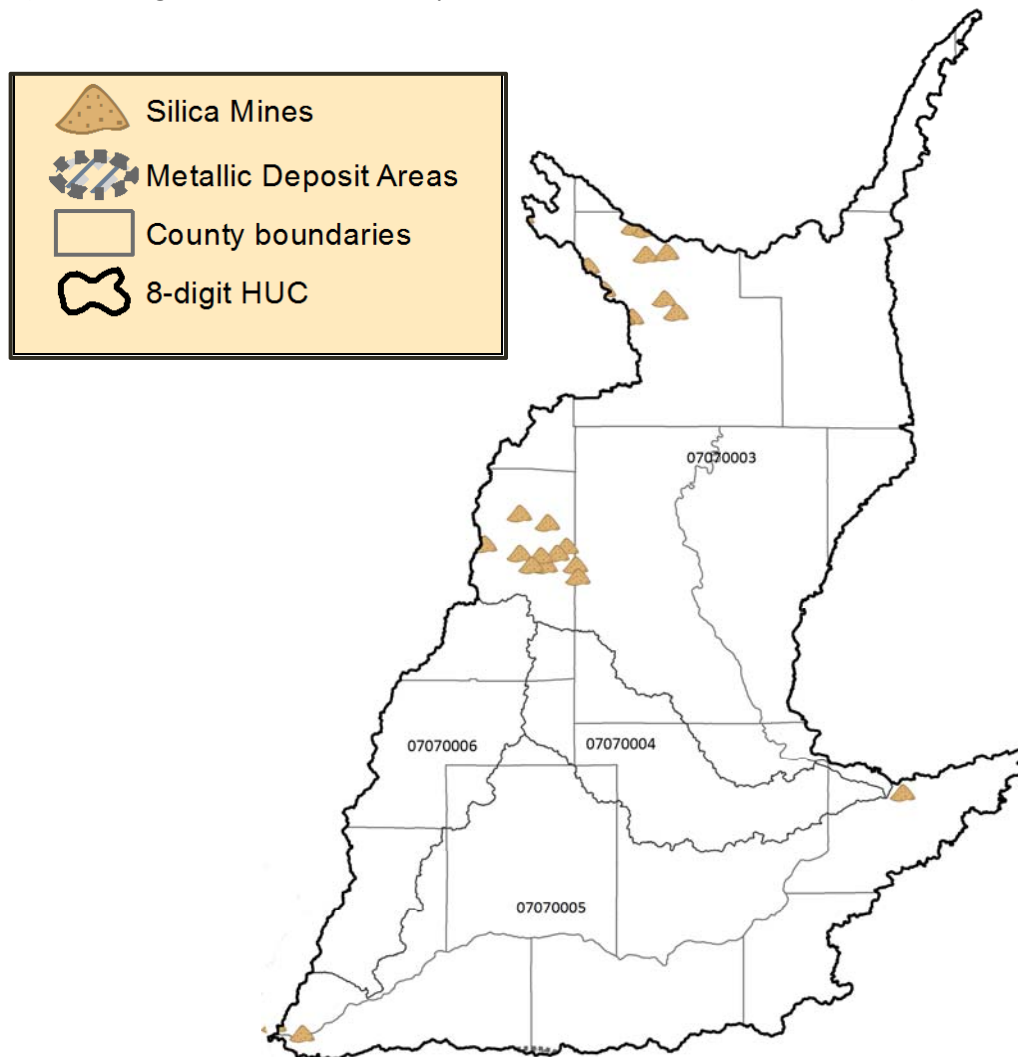
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

#### Anticipated Future Threats:

The Lower Wisconsin SA intersects with both a very small outskirts metallic mining area and non-metallic mining activity zones as depicted on the maps below. However, the Lead Zinc District metallic area barely shown on the map below is not very likely to result in mine activity, nor is it the type of mine activity associated with large open pit sites and does not represent an increased threat. The non-metallic (Frac Sand) activity zones however, do fall within two main areas of this SA as generally shown on the below map. These activities do represent increased threats impact within the Castle-Rock HUC-07070003 and Lower Wisconsin River HUC-07070005 watershed areas.

#### Potential Mining Impacts per HUC-8

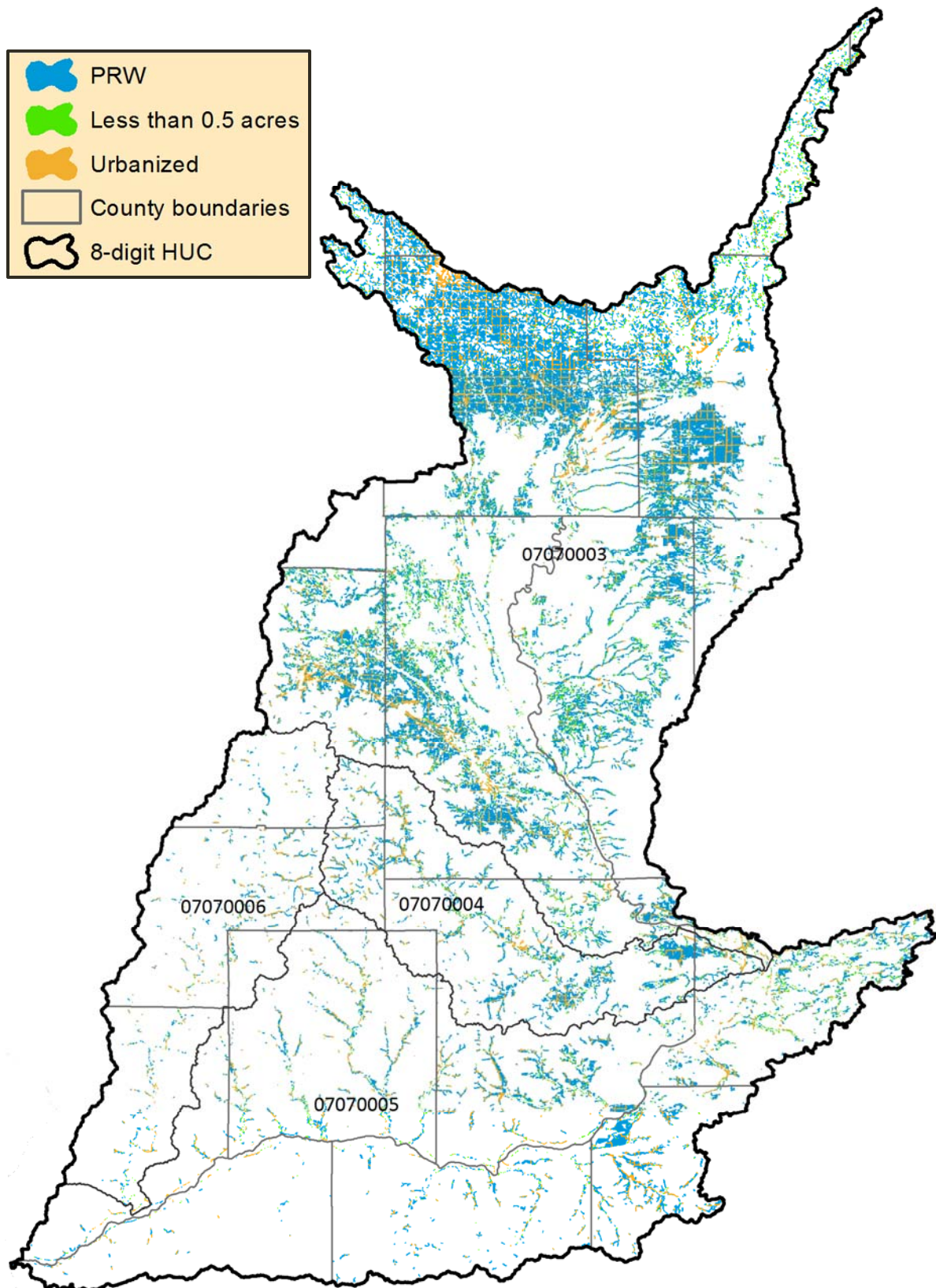
(black straight lines indicate County and/or State boundaries for reference)



**Element III. Historic Loss:**

This watershed like many other of the northern parts of Wisconsin was developed based on the timber and saw mill industry that impacted the wooded wetland vegetation of the area. Dams were also constructed to hold water that could later be used to maintain the river flow to enable logs to be floated downstream. Infrastructure to support the saw mills such as railroads and other means of transportation followed. Saw mills eventually converted to paper mills and settlers and subsequent unique sandy soil based agriculture practices followed suit as lands were cleared and changed the wetland landscape of the area (***WDNR Basin Website 2013***). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



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**Overall Estimated Historic Wetland Percent Loss Summary**

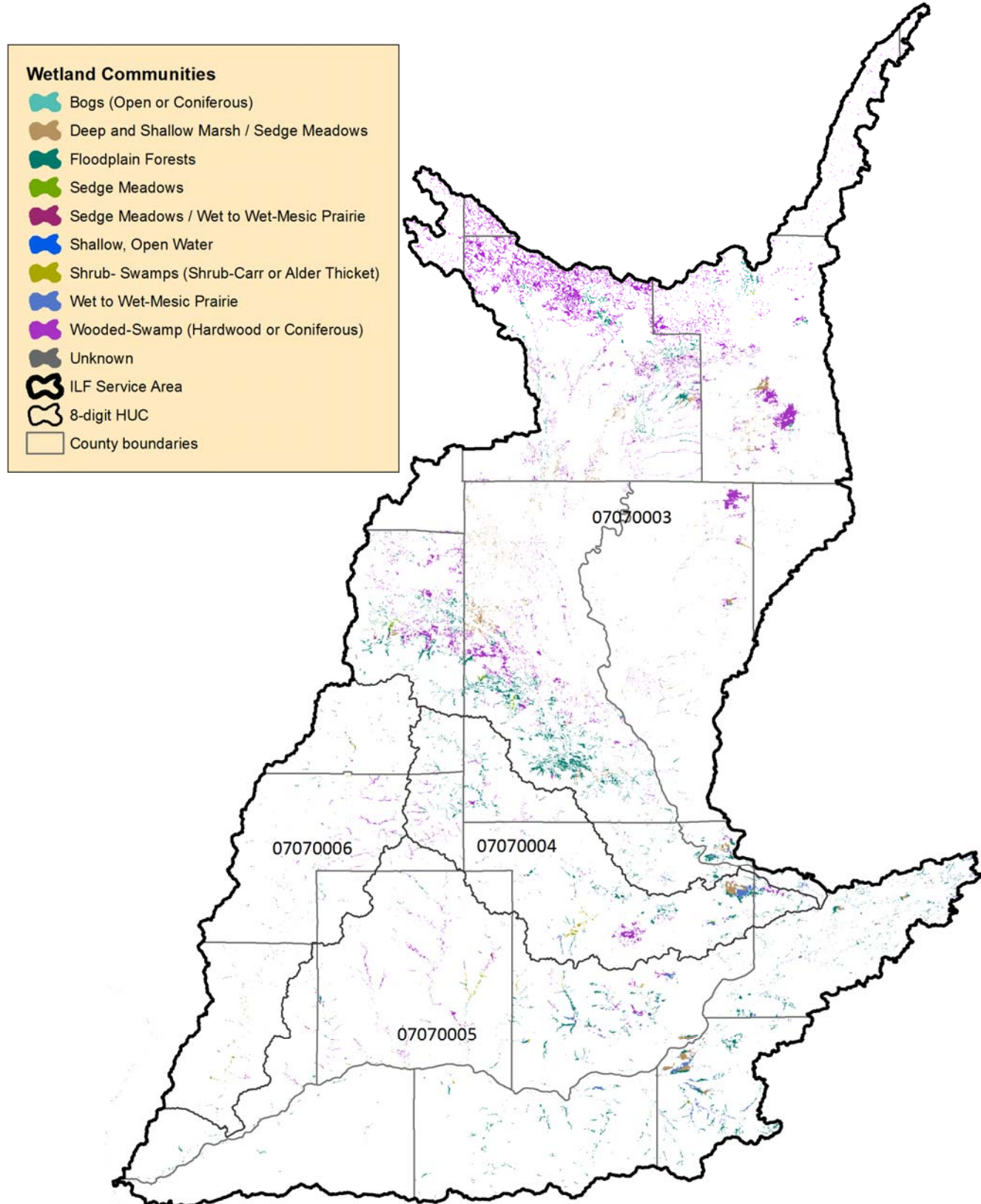
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
07070004 - Baraboo River	12,317	33.97%
07070003 - Castle-Rock	148,510	25.51%
07070005 - Lower Wisconsin River	22,683	21.01%
07070006 - Kickapoo River	2,302	19.92%

The information above identify that the Baraboo-River HUC-07070004 and Castle-Rock HUC-07070003 have sustained the greatest historic loss of wetlands.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



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**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
07070004 - Baraboo River	#DIV/0!	70.16%	40.21%	29.48%	46.23%	38.62%	50.03%	#DIV/0!	54.79%	35.05%
07070003 - Castle-Rock	3.08%	7.68%	36.81%	30.09%	22.90%	7.24%	3.90%	#DIV/0!	19.19%	23.69%
07070005 - Lower Wisconsin River	#DIV/0!	21.63%	23.18%	11.17%	11.12%	4.46%	36.75%	#DIV/0!	48.29%	26.23%
07070006 - Kickapoo River	#DIV/0!	2.83%	20.76%	52.31%	0.00%	13.33%	12.08%	#DIV/0!	0.47%	25.78%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

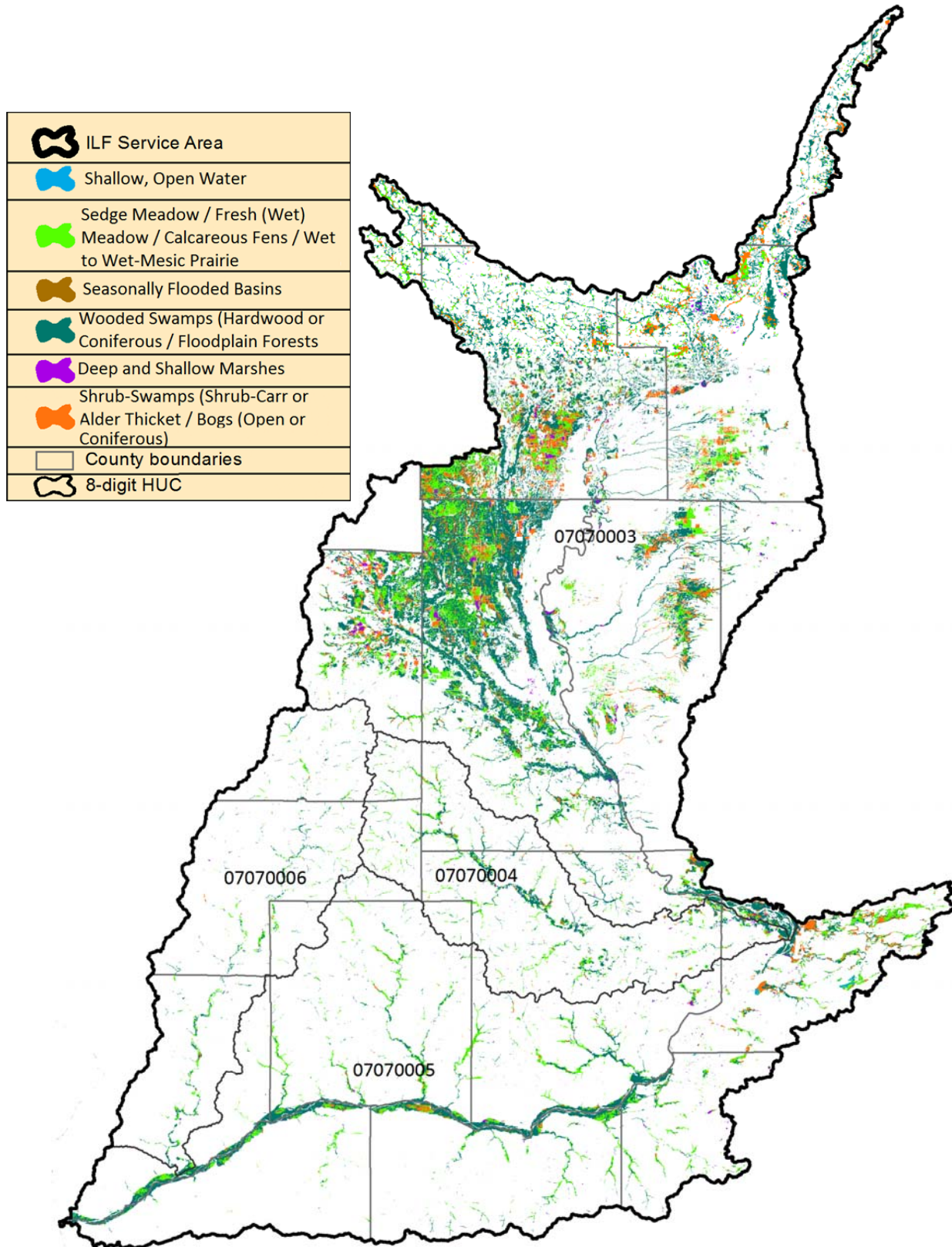
**Element IV. Current Conditions:**

The Lower Wisconsin SA's water quality is generally considered good with primary concerns centered on nonpoint runoff from agricultural land origins along with hydrological alterations of wetland areas. This SA contains few lakes, but an abundance of streams with a large portion being cold water trout fisheries comprised of some of the best trout fishing in the nation (Black Earth Creek). Most of the categorized lakes are actually flowages created to support cranberry culture or resulting from historical attempts to drain wetlands for agricultural purposes. Much of the western portion of this SA lies within the driftless region, which was not covered by the last glacier. Consequently the eastern portion of this SA was historically covered with glacial drift. The north central portion lies within the boundary of glacial Lake Wisconsin, which contains large wetland complexes ranging from wet meadow and open marsh to wooded lowlands. Other wetland areas are abundant along the riparian areas of the many streams and rivers in the watershed with the most common type of wetland resources found in this watershed being forested (**WDNR 2012**).

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



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**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07070003 - Castle-Rock	277.37	105,672.99	512.06	286,400.14	11,648.22	85,399.49	492,487.02
07070005 - Lower Wisconsin River	993.16	33,419.86	1,257.45	51,131.85	1,928.11	12,431.26	101,749.69
07070004 - Baraboo River	1.96	10,437.77	2.37	14,656.22	683.92	2,077.72	28,294.92
07070006 - Kickapoo River	0.00	5,199.93	0.00	6,279.53	241.32	367.73	12,153.26

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07070003 - Castle-Rock	0.06%	21.46%	0.10%	58.15%	2.37%	17.34%	100.00%
07070005 - Lower Wisconsin River	0.98%	32.85%	1.24%	50.25%	1.89%	12.22%	100.00%
07070004 - Baraboo River	0.01%	36.89%	0.01%	51.80%	2.42%	7.34%	100.00%
07070006 - Kickapoo River	0.00%	42.79%	0.00%	51.67%	1.99%	3.03%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and are trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitats.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient/sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other

important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.

8. Restore, enhance, establish and/or preserve 10 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Castle-Rock****HUC – 07070003**

This watershed has lost approximately 25.51% of its overall historic wetlands, which is moderate for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 46.247 acres of wetland loss, which is the highest for this service area. Permit trends show Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Calcareous Fens under the greatest pressure from permit impacts. Sedge Meadows, Wet to Wet-Mesic Prairie, Floodplain Forests and Wooded Swamps have sustained the greatest estimated historic percentage losses, which is reinforced by corresponding significant estimated acreage losses. The overall land use within this watershed is mostly natural at 60.42% followed by agriculture at 38.35% leaving only a very small 1.23% developed. The natural land use is comprised of mainly deciduous forest, woody wetlands, emergent herbaceous wetlands and evergreen forest, while the agriculture land use area is overwhelmingly cultivated crops having the second highest amount program wide. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies. Therefore, Wooded Swamps, Floodplain Forests, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall forested setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Northern Sedge Meadow, Calcareous Fen and Bog (Coniferous or Open).

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Northern Sedge Meadow, Calcareous Fen and Bog (Coniferous or Open).

**Baraboo River****HUC – 07070004**

This watershed has lost approximately 33.97% of its overall historic wetlands, which is the highest for this service area. Corps permitted actions over the past 5 years depicts 0.451 acres of wetland loss, which is the lowest for this service area. Permit trends show Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairie and Calcareous Fens under the greatest pressure from permit impacts. Estimated historic loss percentages are widely spread amongst several categories including, Sedge Meadows, Wet to Wet-Mesic Prairie, Deep and Shallow Marshes, Shrub Swamps, Floodplain Forests and Wooded Swamps. Estimated historic acreage losses were reviewed to further support these wetland

type losses and reveal the same outcome with significant acreage losses across the same types. The overall land use within this watershed is largely agriculture at 44.94% followed by spilt between developed at 27.93% and natural at 27.13%, representing the most developed watershed within this service area. The agriculture land use area is mostly cultivated crops with some pasture/hay, while the natural land use is comprised of mainly deciduous forest, woody wetlands and emergent herbaceous wetlands. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, Wet to Wet-Mesic Prairie. Therefore, Wooded Swamps, Floodplain Forests, Shrub Swamps, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall forested, emergent herbaceous wetland setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine – Red Maple, Wet Prairie, Wet Mesic-Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Wet to Wet-Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine – Red Maple, Wet Prairie, Wet Mesic-Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

#### **Lower Wisconsin River HUC – 07070005**

This watershed has lost approximately 21.01% of its overall historic wetlands, which is moderate for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 2.546 acres of wetland loss. Permit trends show Deep and Shallow Marshes and unspecified types under the greatest pressure from permit impacts. Wet to Wet-Mesic Prairies and Shrub Swamps have sustained the greatest estimated historic percentage losses at 48.29% and 36.75% respectively, followed with the remaining types all having significant percentage losses. Estimated historic acreage losses further support that historic losses were wide spread amongst wetland types. The overall land use within this watershed is mainly split between natural at 47.77% and agriculture at 46.91% leaving only 5.32% developed. The agriculture land use area is overwhelmingly cultivated crops, while the natural land use is comprised of mainly deciduous forest and then distributed amongst the remaining categories reflecting the diverse composition of the watershed. Current mapped wetlands are dominated by Wooded Swamps, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, and Wet to Wet-Mesic Prairie. Therefore, replacing Wooded Swamps, Floodplain Forests, Shrub Swamps, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall diverse composition of the natural land use and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wet to Wet-Mesic Prairie, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests, Shrub Swamps (Shrub-Carr or Alder Thicket), Sedge Meadows and Fresh (Wet) Meadows.

- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Kickapoo River HUC – 07070006**

This watershed has lost approximately 19.92% of its overall historic wetlands, which is the lowest for this service area. Corps permitted actions over the past 5 years depicts 2.410 acres of wetland loss. Permit trends show Deep and Shallow Marshes and unspecified types under the greatest pressure from permit impacts. Sedge Meadows have sustained the greatest estimated historic loss at 52.31% followed by Wooded Swamps at 25.78% and Floodplain Forests at 20.76% with Shrub Swamps also suffering significant estimated acreage losses. The overall land use within this watershed is mainly split between agriculture at 47.41% and natural at 47.02% leaving only 5.56% developed. The agriculture land use area is mainly cultivated crops with some pasture/hay areas, while the natural land use is comprised of mainly deciduous forest, shrub/scrub and woody wetlands. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, and Wet to Wet-Mesic Prairie. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall forested setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, White Pine-Red Maple, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Existing Advanced Watershed Plans (AWP): None****Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

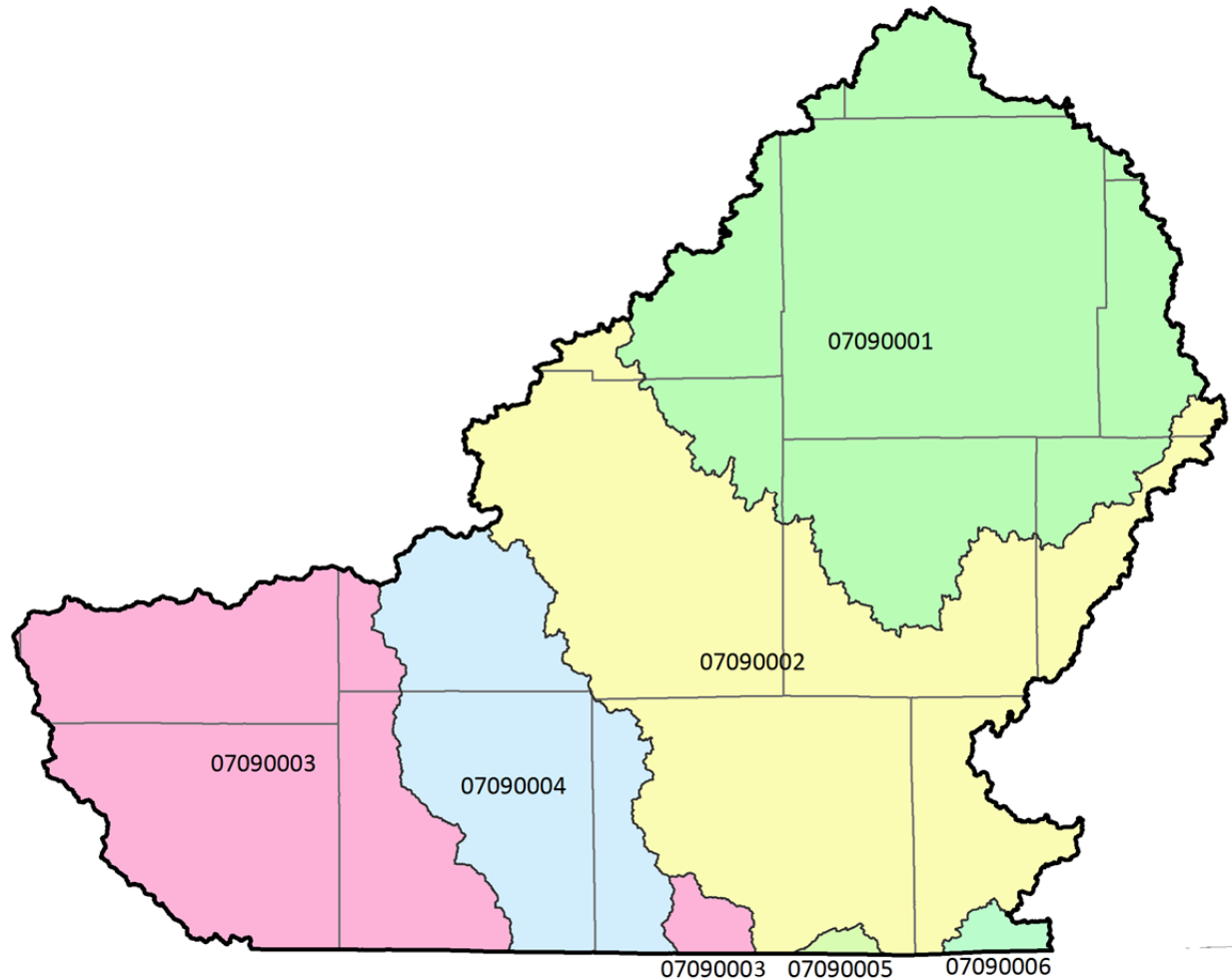
**Fourth,** prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Rock CPF

### Element I. Service area:

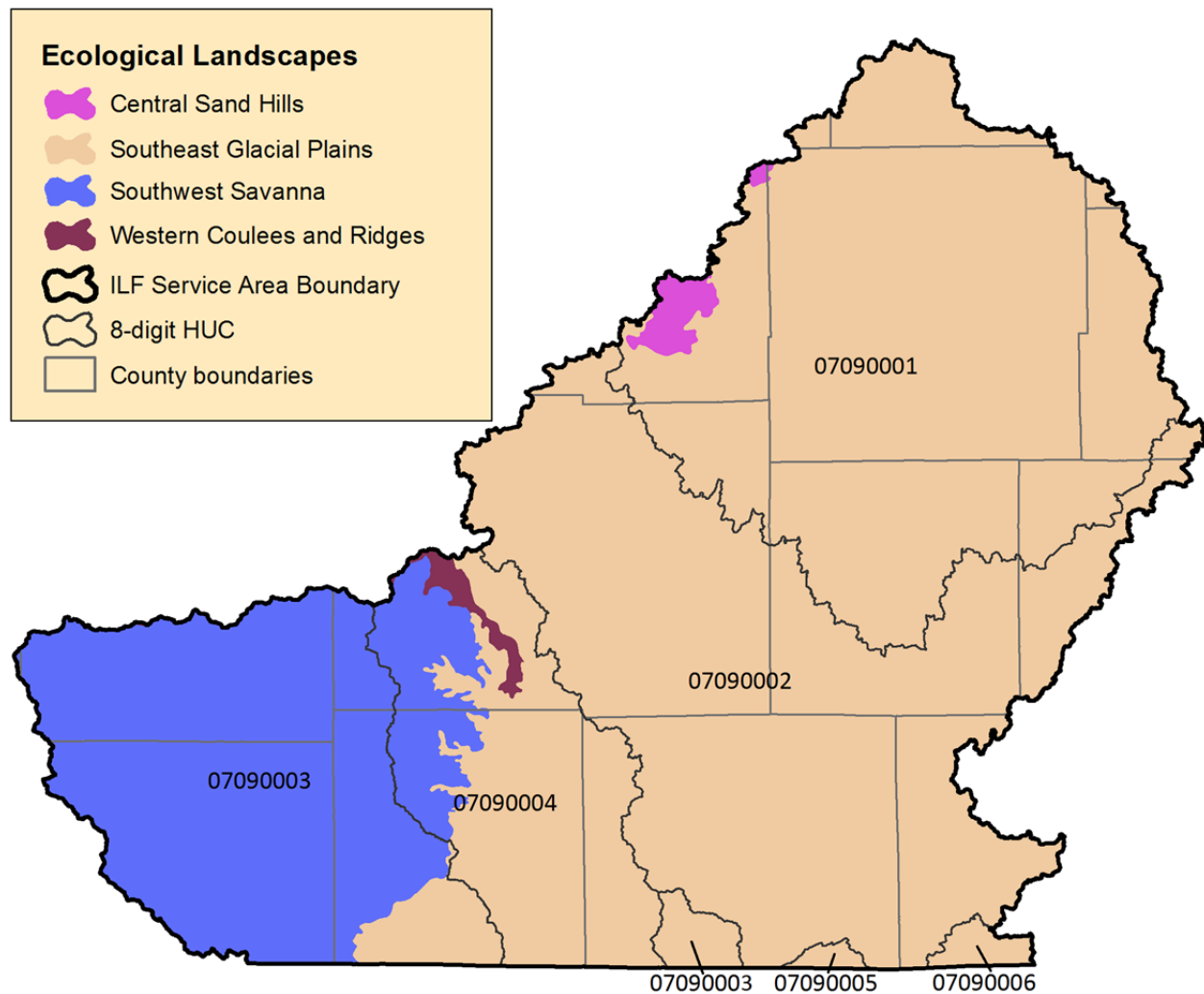
#### Overall SA Area with separate HUC-8 watersheds designated in color

(county & state boundaries shown in straight lines for further reference)



The Rock Service area is located at the southern tip of Wisconsin comprised of Green Lake, Fond Du Lac, Columbia, Dodge, Washington, Iowa, Dane, Jefferson, Waukesha, Lafayette, Green, Rock and Walworth counties and drains an area approximately 4,815 square miles.

Ecological Landscapes include **(WDNR 2012)**:

**Ecological Landscapes per HUC-8**

**Central Sand Hills** – Typical of south central Wisconsin; mean growing season of 144 days, mean annual temperature is 44.8 deg. F, average January minimum temperature is 4deg. F, average August maximum temperature is 81deg. F, mean annual precipitation is 33 inches, mean annual snowfall is 44 inches. Although the climate is suitable for agricultural row crops, small grains, and pastures, the sandy soils somewhat limit agricultural potential. The landforms in this Ecological Landscape include a series of glacial moraines (the Johnstown Moraine is the terminal moraine of the Green Bay lobe; the Arnott Moraine is older, and has more subdued topography. Pitted outwash is extensive in some areas. Glacial tunnel channels occur here, e.g., in Waushara County, just east of and visible from I-39. Soils are primarily sands. Organic soils underlie wetlands such as tamarack swamps and sedge meadows. Muck farming still occurs in some areas. Mosaic of extensive wetlands and small kettle lakes in the outwash areas, and the headwaters of coldwater streams originating in glacial moraines. Some seepage lakes and ponds exhibit dramatic natural water level fluctuations which create important Inland Beach and Coastal Plain Marsh habitats. The Wisconsin River and a short but ecologically important stretch of the lower Baraboo River flow through this Ecological Landscape. Other important rivers include the Fox, Grand, Mekan, Montello, Puchyan, and White. Large impoundments occur on the Wisconsin (Lake Wisconsin),

Fox (Buffalo and Puckaway lakes) and Grand (Grand River Marsh) rivers. Current vegetation is more than one-third agricultural crops, one third forest, and almost 20% grasslands with smaller amounts of open wetland, open water, shrubs, unvegetated (termed "barren" in WISCLAND), and urban areas. Large contiguous areas of any of the major natural or surrogate vegetation types are uncommon. Population is estimated at 182,035, comprising 3.2% of the state total resulting in a population density of approximately 59 persons/ sq. mile. Scattered Federal Waterfowl Production Areas, Fox River National Wildlife Refuge, scattered state-owned and managed lands, including Hartman Creek State Park, several State Wildlife Areas, Fisheries Areas, and Natural Areas.

**Southeast Glacial Plains** – Typical of southern Wisconsin; mean growing season of 155 days, mean annual temperature is 45.9 deg. F, mean annual precipitation is 33.6 inches, and mean annual snowfall is 39.4 inches. The climate is suitable for agricultural row crops, small grains, and pastures, which are prevalent in this Ecological Landscape. The dominant landforms are glacial till plains and moraines composed mostly of materials deposited during the Wisconsin Ice Age, but the southwestern part of the Ecological Landscape consists of older, pre-Wisconsin till and the topography is more dissected. Other glacial landforms, including drumlins, outwash plains, eskers, kames and kettles are also well-represented kames, eskers, and kettles. The "Kettle Moraine" is an area of rough topography on the eastern side of the Southeast Glacial Plains that marks the areas of contact between the Green Bay and Lake Michigan glacial lobes. Numerous excellent examples of glacial features occur and are highly visible in the Kettle Moraine. Soils are derived from lime-rich tills overlain in most areas by a silt-loam loess cap. The Southeast Glacial Plains has the highest aquatic productivity for plants, insects, other invertebrates, and fish of any Ecological Landscape in the state. Significant river systems include the Wolf, Bark, Rock, Fox, Milwaukee, Sugar, Mukwonago, and Sheboygan. Most riparian zones have been degraded. Several clusters of large lakes exist, including the Yahara chain of lakes in and around Madison, and the Lake Winnebago Pool system. Kettle lakes occur within end moraines, in outwash channels, and in ancient riverbeds. This Ecological Landscape contains some huge marshes, as well as fens, sedge meadows, wet prairies, tamarack swamps, and floodplain forests. Many wetlands here have been affected by hydrologic modifications (ditching, diking, tiling), grazing, infestations of invasive plants, and excessive inputs of sediment- and nutrient-laden runoff from croplands. Primarily agricultural cropland (58% of Landscape). Remaining forests occupy only 11% of the land area and major cover types include maple-basswood, oak, lowland hardwoods, and conifer swamps (mostly tamarack-dominated). No large areas of upland forest exist except on the Kettle Interlobate Moraine, where the topography is too rugged to practice intensive agriculture and the soils are not always conducive to high crop productivity. Wetlands are extensive (12% of Landscape, 593,248 acres) and include large marshes and sedge meadows, and extensive forested lowlands within the Lower Wolf River floodplain. Forested lowlands are also significant along stretches of the Milwaukee, Sugar, and Rock rivers. Population is estimated at 1,519,000, comprising 28.5% of the state total resulting in a population density of approximately 204 persons/ sq. mile. Only four percent of the Southeast Glacial Plains is in public ownership (226,230 acres), of which 58% is wetland and 42% is upland.

**Southwest Savanna** – Typical of southern Wisconsin; the mean growing season is 153 days, mean annual temperature is 45.6 deg. F, mean annual precipitation is 35.2, and mean annual snowfall is 39.9

inches. However, the Southwest Savanna has the fourth longest growing season, the most precipitation, the third lowest snowfall, and second warmest January low temperature among Ecological Landscapes in the state. The climate tends to be warmer in the southwestern part of the state, which affects the ecology of the Southwest Savanna and also makes it suitable for most agricultural uses. 80% of this Ecological Landscape is devoted to row crops, small grains, and pastures. The Southwest Savanna is part of Wisconsin's Driftless Area, a region that has not been glaciated for at least the last 2.4 million years. The topography is characterized by broad, open ridgetops, deep valleys, and steep, wooded slopes. Soils on hilltops are silt loams mostly silt loams. In some areas soils are shallow, with bedrock or stony red clay subsoil very close to or at the surface. In other locales the ridgetops have a deep cap of loess-derived silt loam (these are the most productive agricultural soils). Valley soils include alluvial sands, loams, and occasionally, peats. The drainage patterns of streams in the Southwest Savanna are dendritic, which is a pattern characteristic of unglaciated regions but absent or uncommon in most of Wisconsin. Flowing waters include warmwater rivers and streams, coldwater streams, and springs. Natural Lakes are virtually absent, though there are a few associated with the floodplains of the larger rivers. Natural lakes are rare but there are a few in the floodplains of the larger rivers, such as the Pecatonica. Impoundments and reservoirs have been constructed on some rivers and streams, and check dams have been built in ravines to hold storm and snow runoff. Agricultural crops (corn, soybeans, small grains, hay) cover 70% of this Ecological Landscape, with lesser amounts of grassland (mostly pasture), forest, and residential areas. The major forest types are oak-hickory and maple-basswood. Prairie remnants of varying quality persist in a few places, mostly on rocky hilltops or slopes that are too steep to farm. Some pastures have never been plowed, and those that historically supported prairie may retain remnants of the former prairie flora. Pastures with scattered open-grown oaks still exist in some areas, mimicking oak savanna structure. A complement of native plants persists in some of these pastured savannas. Population is estimated at 123,899, comprising 2.2% of the state total resulting in a population density of approximately 39 persons/ sq. mile. About 96.5% of the land in the Southwest Savanna is privately owned while 3.5% belongs to state, county, or municipal governments.

**Western Coulee & Ridges** – Typical of southern Wisconsin; mean growing season of 145 days, mean annual temperature is 43.7 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 43 inches. Because it extends over a considerable latitudinal area, the climate varies from north to south. The climate is favorable for agriculture, but steep slopes limit intensive agricultural uses to broad ridgetops and parts of valleys above floodplains. The climate variability, along with the rugged ridge and coulee (valley) topography, numerous microhabitats, and large rivers with broad, complex floodplains, allows for a high diversity of plants and animals. Characterized by its highly eroded, unglaciated topography with steep sided valleys and ridges, high gradient headwaters streams, and large rivers with extensive, complex floodplains and terraces. Ancient sand dunes occur on some of the broader terraces along the Mississippi and Wisconsin rivers. Windblown loess of varying thickness; alluvium in the floodplains. Organic soils, especially peats, are rare. Dendritic drainage patterns are well-developed in this mostly unglaciated Ecological Landscape. Natural lakes are restricted to the floodplains of large rivers. Large warmwater rivers are especially important here, and include the Wisconsin, Chippewa, and Black. The Mississippi River forms the Ecological Landscape's western boundary. Numerous spring-fed

(coldwater) headwaters streams occur here. Coolwater streams are also common. Current vegetation is a mix of forest (41%), agriculture (36%), and grassland (14%) with wetlands (5%) mostly in the river valleys. Primary forest cover is oak-hickory (51%). Maple-basswood forests (28%), dominated by sugar maple, basswood and red maple, are common in areas that were not burned frequently. Bottomland hardwoods (10%) dominated by silver maple, swamp white oak, river birch, ashes, elms, and cottonwood are common within the floodplains of the larger rivers. Relict "northern" mesic conifer forests composed of hemlock, white pine and associated hardwoods such as yellow birch are rare but do occur in areas with cool, moist microclimates. Dry rocky bluffs may support xeric stands of native white pine, sometimes mixed with red or even jack pine. Prairies are now restricted to steep south- or west-facing bluffs, unplowed outwash terraces along the large rivers, and a few other sites. They occupy far less than 1% of the current landscape. Mesic tallgrass prairies are now virtually nonexistent except as very small remnants along rights-of-way or in cemeteries. Population is estimated at 614,553, comprising 10.8% of the state total resulting in a population density of approximately 54 persons/ sq. mile. Public ownership in this Ecological Landscape is limited (only about 3%) and much of it is associated with the large rivers (i.e. Mississippi, Wisconsin, Chippewa and Black rivers).

This Service area can be further broken down into six smaller HUC-8 watersheds, the Kiskauke River (07090006), Pecatonica River (07090003), Sugar River (07090004), Lower Rock-Piscasaw Creek (07090005), Lower Rock River (07090002) and Upper Rock River (07090001). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

#### **Element II. Threats:**

Overall wetland resource threats within this service area include a very high rate of agricultural activity throughout, groundwater depletion from high capacity withdrawals in the eastern half, water quality throughout resulting in 303d listed impaired waters, invasive species throughout, fragmentation of corridors, flooding throughout and land use changes. This service area can be roughly divided in half, creating an eastern portion and western portion. The eastern portion (Southeast Glacial Plains **WDNR 2012**) has been heavily developed with agricultural practices very well represented throughout this area that highly fragment this area. High capacity wells used largely for irrigation are also spread throughout this region threatening to deplete groundwater. Nonpoint runoff and nutrient loading threaten resources with a large quantity of 303d listed impaired waterways present. While the western areas (Southwest Savanna **WDNR 2012**) have less development and agriculture land use in comparison, it's resources remain largely threatened from these activities from fragmentation, adverse impacts to hydrology and an overall reduction of prairie grassland areas. Invasive species are well established and pose a major threat to wetland areas. Nonpoint runoff and nutrient loading from agricultural practices threatens the quality of many aquatic resources resulting in large lists of 303d impaired waterways.

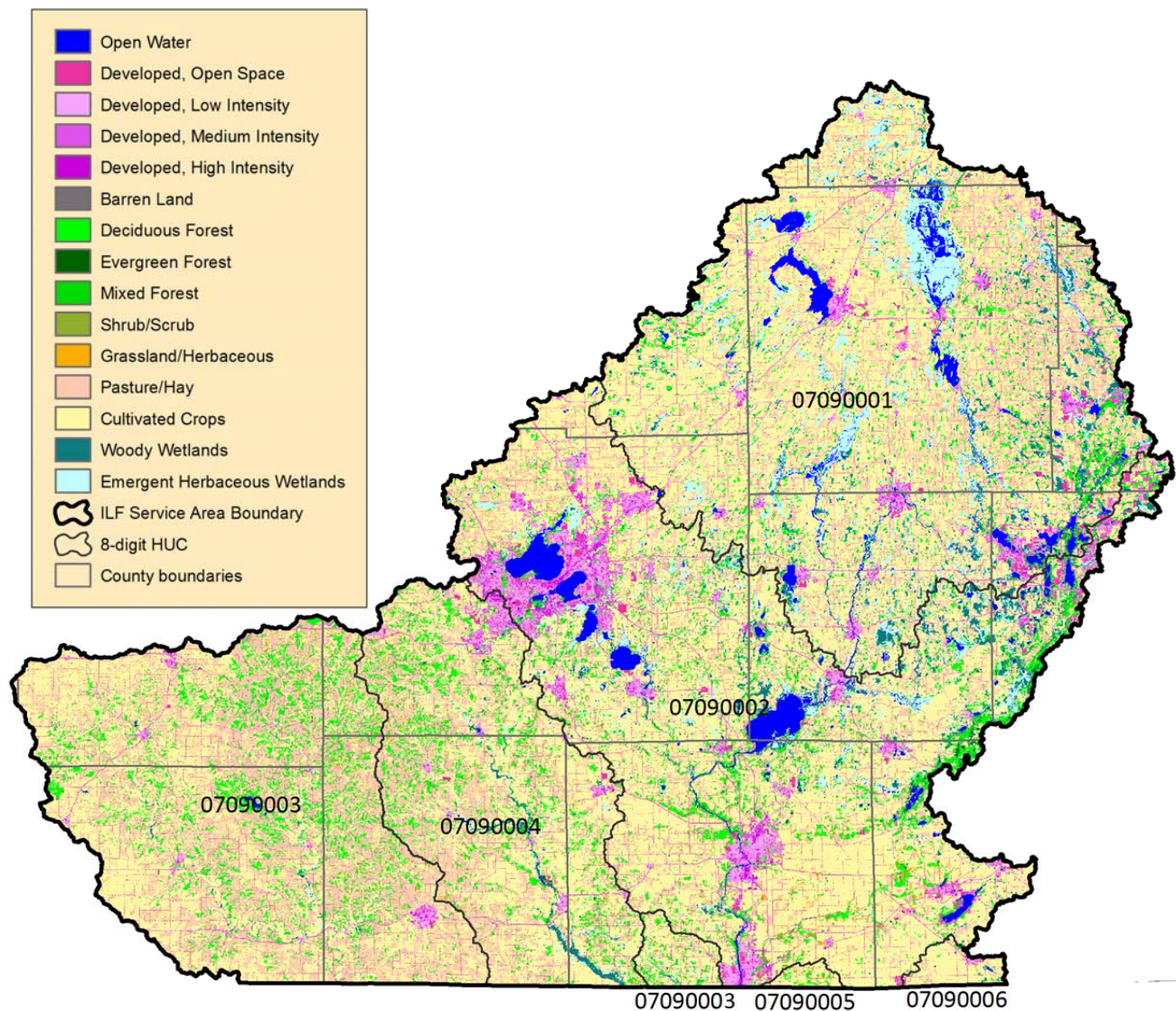
The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit

impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

### Current Land Use:

#### Land Use (NLCD 2006) per HUC-8

(black straight lines indicate County and/or State boundaries for reference)



**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07090006 - Kishwaukee River	118,603	100,401	17,139	1,063	84.65%	14.45%	0.90%
07090003 - Pecatonica River	860,015	169,202	588,352	102,462	19.67%	68.41%	11.91%
07090004 - Sugar River	450,225	40,789	332,763	76,673	9.06%	73.91%	17.03%
07090005 - Lower Rock-Piscasaw Creek	41,420	32,966	6,774	1,680	79.59%	16.36%	4.05%
07090002 - Lower Rock River	995,674	444	745,452	249,778	0.04%	74.87%	25.09%
07090001 - Upper Rock River	1,112,372	1,924	838,336	272,112	0.17%	75.36%	24.46%

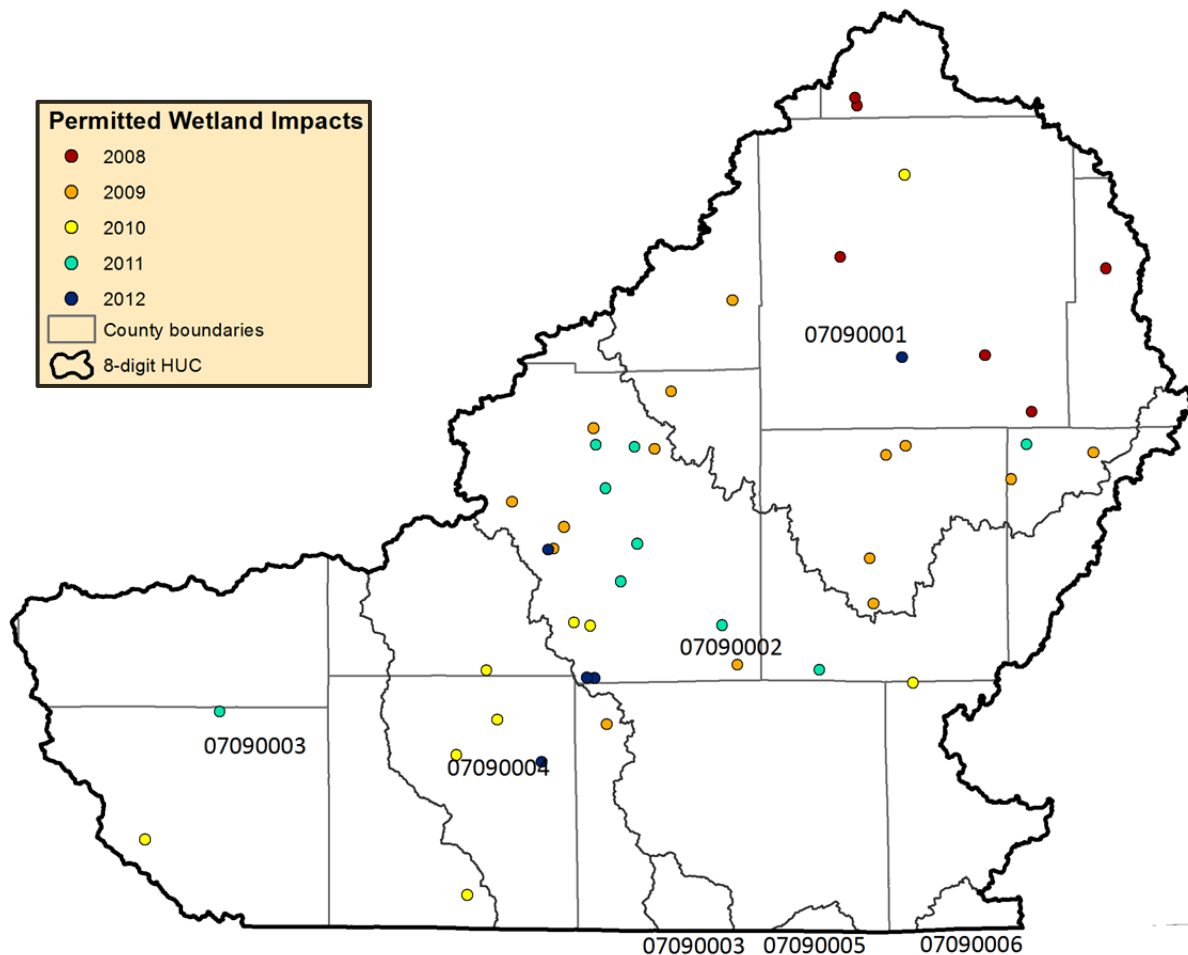
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Kishwaukee River HUC-07090006 is under the greatest threat from development with 84.65% of its area containing development based land uses and only 0.90% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07090001 - Upper Rock River	62%	2%	19%	2%	8%	7%	82.727
07090004 - Sugar River	95%	0%	5%	0%	0%	0%	20.001
07090002 - Lower Rock River	83%	0%	0%	0%	17%	0%	2.104
07090003 - Pecatonica River	18%	0%	82%	0%	0%	0%	0.11
07090005 - Lower Rock-Piscasaw Creek	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0
07090006 - Kishwaukee River	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0

The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

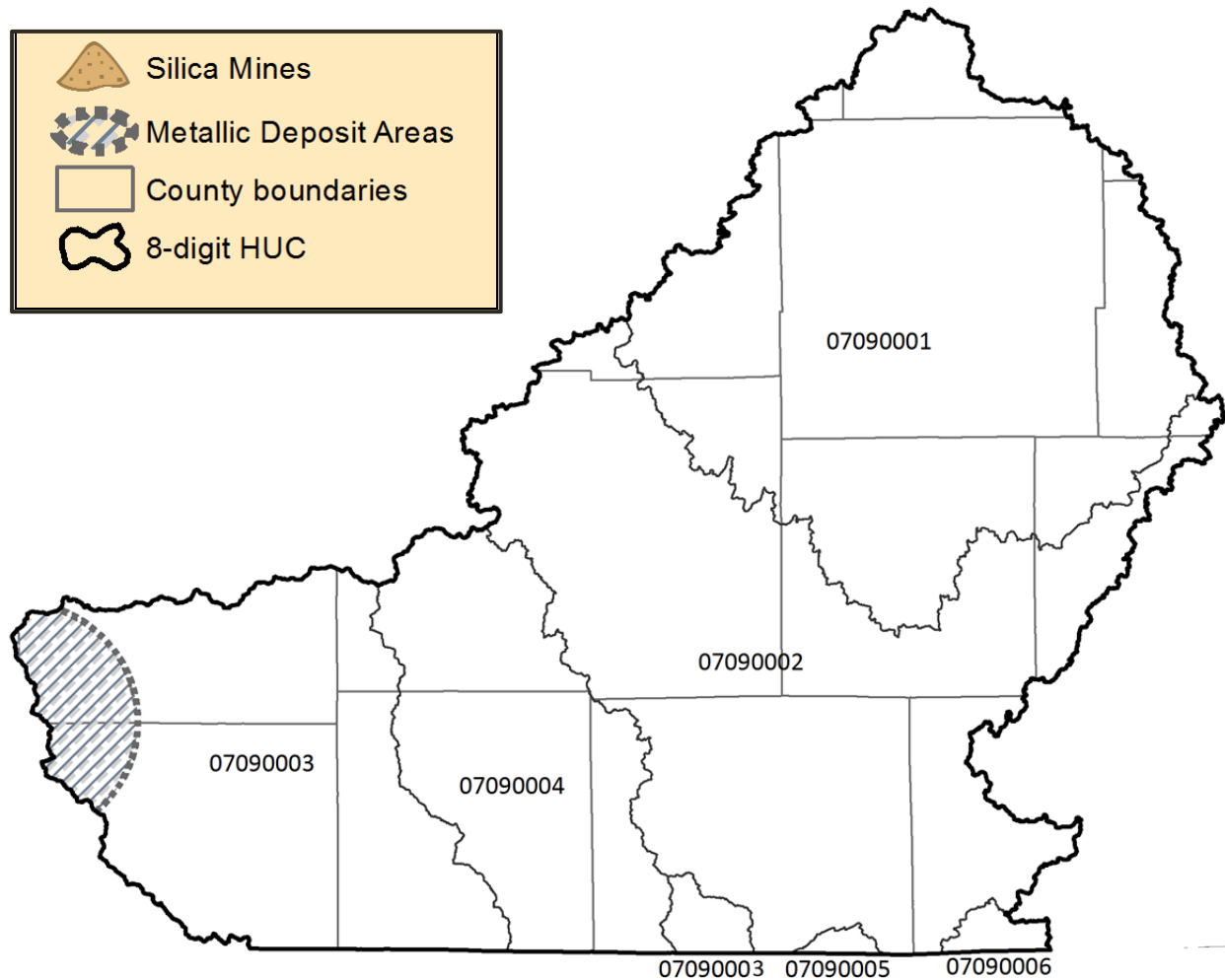
**Anticipated Future Threats:**

The Rock SA does intersect with the Lead Zinc District metallic exploration areas, however, this area shown on the map below is not very likely to result in mine activity, nor is it the type of mine activity

associated with large open pit sites and does not represent an increased threat. This SA does not contain activity zones for non-metallic mining and therefore there are no foreseen increased future threats.

#### Potential Mining Impacts per HUC-8

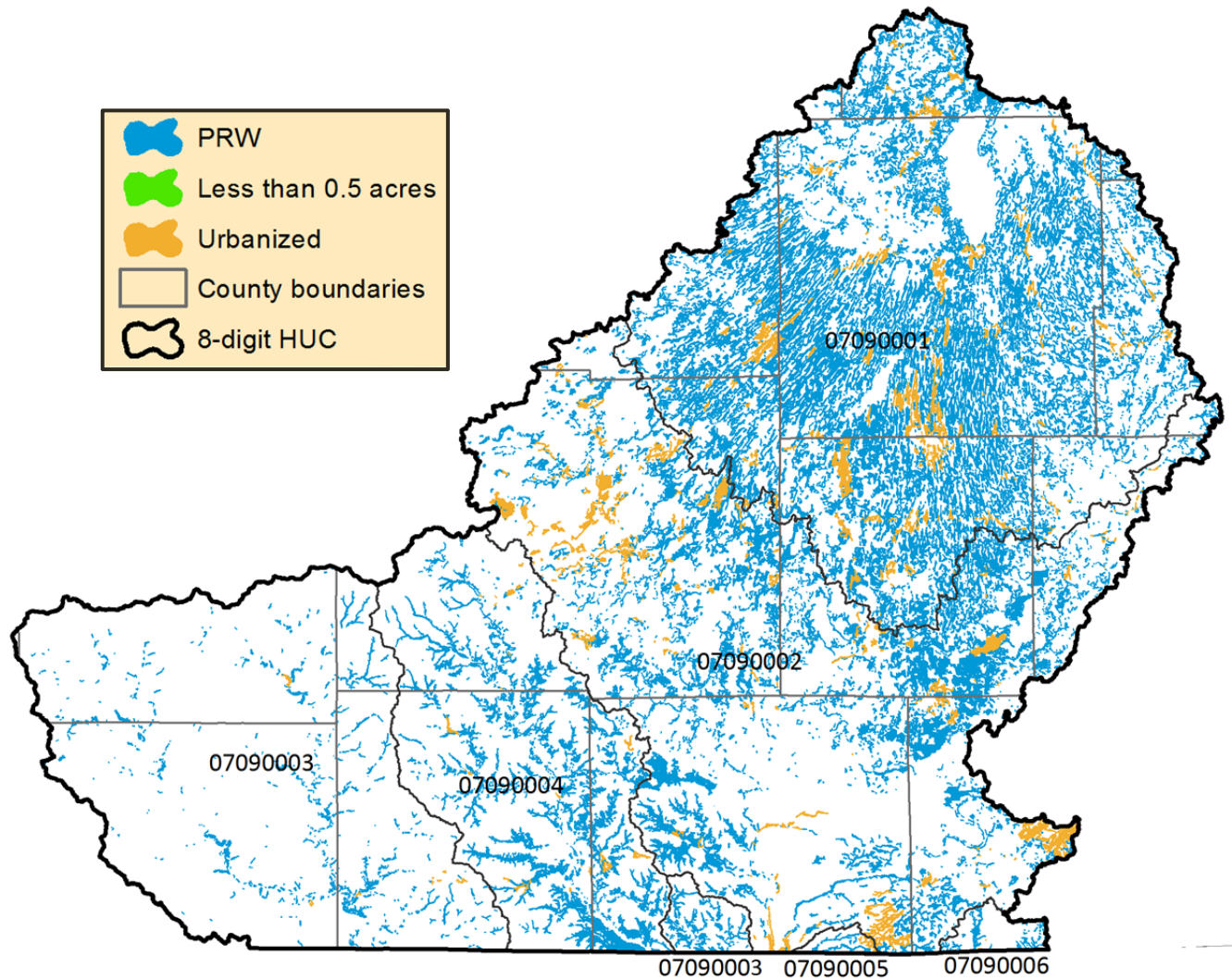
(black straight lines indicate County and/or State boundaries for reference)



#### Element III. Historic Loss:

This watershed has been most impacted by agricultural practices that still dominate the land use. Also located within the western areas of this watershed is the center of historic lead and zinc mining district with most being adjacent to streams, drainage ways and their associated wetlands. The economic development of the area was due largely in part to the railroad, which brought with it opportunity to grow commerce and industry leading to subsequent development that heavily impacted wetlands (**WDNR Basin Website 2013**). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



**Overall Estimated Historic Wetland Percent Loss Summary**

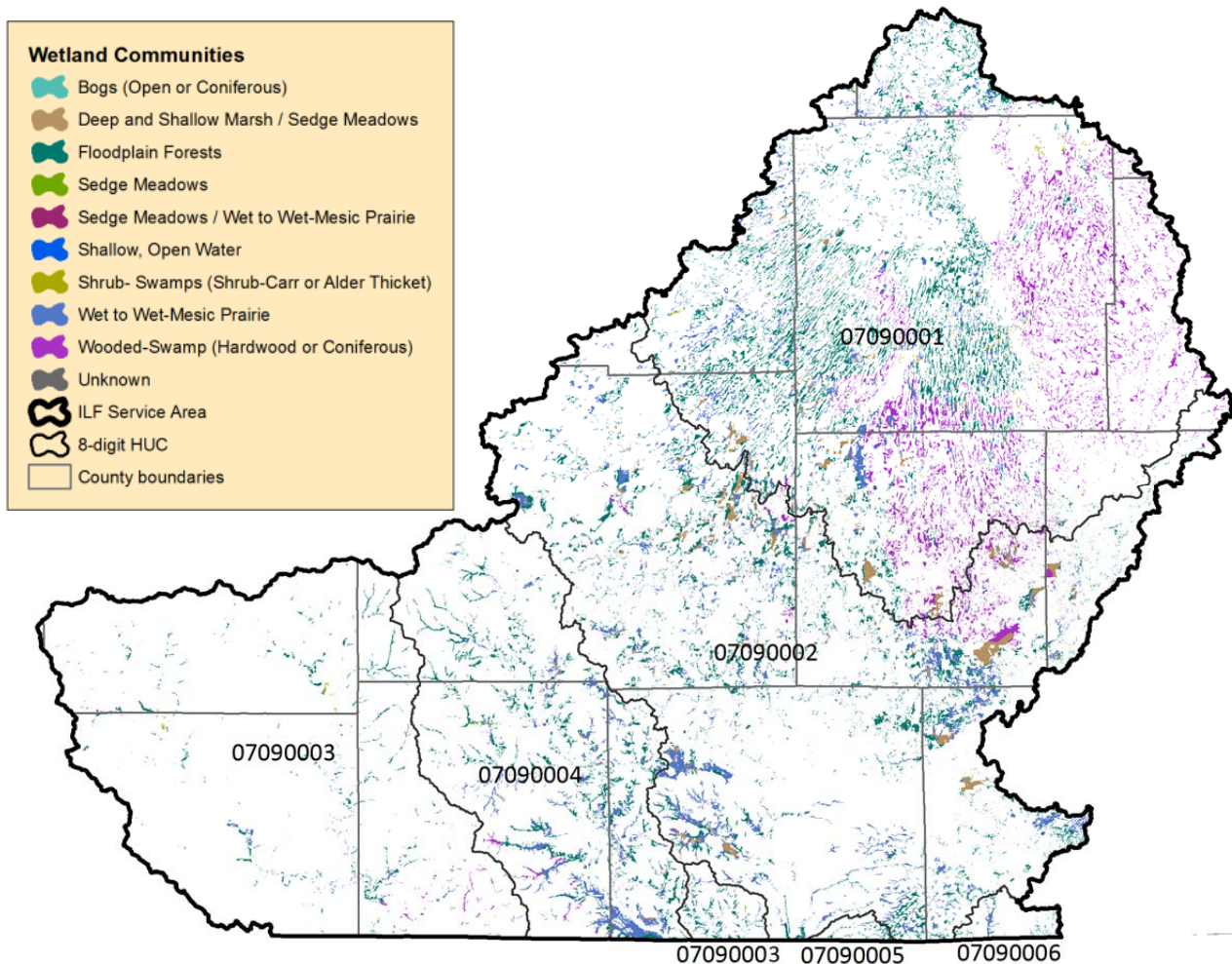
(sorted from greatest to least historic loss)

HUC	Acres of PRW Opportunity	Historic Wetland Loss % (Total PRW all / Total historic)
07090005 - Lower Rock-Piscasaw Creek	472	69.88%
07090006 - Kishwaukee River	1,164	63.19%
07090004 - Sugar River	39,485	58.39%
07090003 - Pecatonica River	12,234	50.91%
07090002 - Lower Rock River	95,554	49.17%
07090001 - Upper Rock River	152,247	43.70%

The information above depict heavy historic loss of wetlands throughout all of the HUC-8 watersheds, however the Lower Rock-Piscasaw Creek HUC-07090005 and Kishwaukee River HUC-07090006 areas lead the way in historic loss of wetlands.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge Meadows	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder Thicket)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or Coniferous)
07090005 - Lower Rock-Piscasaw Creek	#DIV/0!	#DIV/0!	69.40%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	100.00%	#DIV/0!
07090006 - Kishwaukee River	#DIV/0!	82.25%	57.89%	#DIV/0!	#DIV/0!	#DIV/0!	4.02%	#DIV/0!	90.18%	#DIV/0!
07090004 - Sugar River	#DIV/0!	31.11%	68.99%	48.03%	2.81%	60.27%	1.08%	#DIV/0!	71.48%	93.81%
07090003 - Pecatonica River	#DIV/0!	19.77%	56.69%	87.72%	90.99%	14.69%	61.27%	#DIV/0!	55.53%	87.35%
07090002 - Lower Rock River	#DIV/0!	40.40%	55.70%	23.32%	0.72%	30.11%	0.93%	#DIV/0!	74.46%	45.10%
07090001 - Upper Rock River	#DIV/0!	14.17%	56.75%	19.78%	40.70%	14.62%	46.29%	#DIV/0!	56.61%	47.97%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

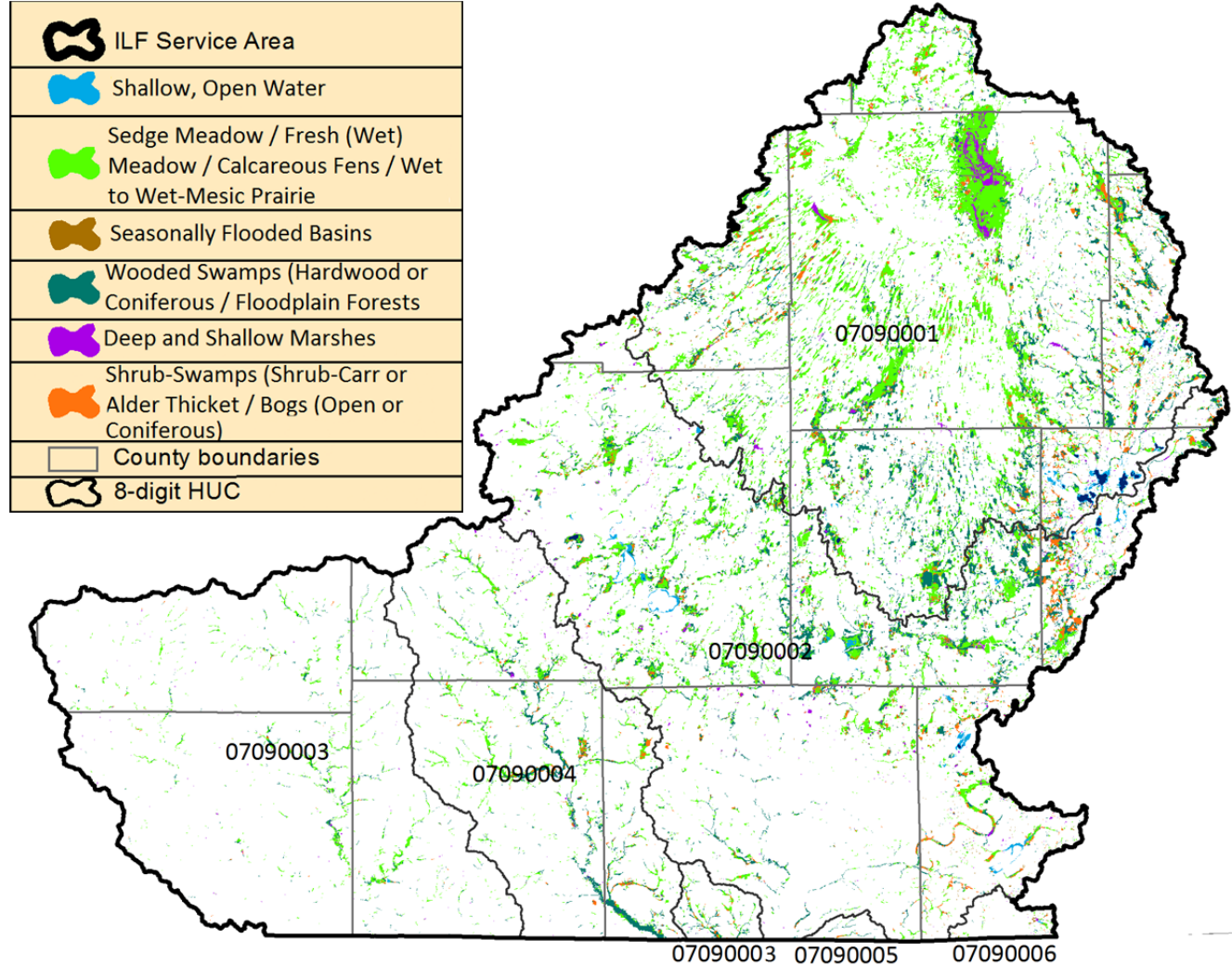
**Element IV. Current Conditions:**

The Land use within the Rock SA is similar to other portions of the state and is dominated by pockets of urban developed centered around agriculture with crops cultivation leading the way as area soils are fertile and productive. This area is also home to Horicon Marsh, which comprises the confluence of East, South and West branches of the Rock River. Despite the rural character of the watershed urbanization is a growing trend in this glaciated portion of the state. The overall watershed has been heavily impacted by sedimentation and nutrient loading stemming from non-point runoff from agricultural sources and also suffers from habitat fragmentation and alteration of hydrology to accommodate farming. These same activities have also lead to significant groundwater contamination, mainly in the portions of the Lower Rock River Basin (**WDNR Basin Website 2013**). Rural land uses and pockets of urban development stemming from agriculture activities will continue to lead the way in wetland impacts.

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07090001 - Upper Rock River	2,567.43	126,194.14	913.22	57,458.82	11,221.06	20,824.53	221,649.92
07090002 - Lower Rock River	4,567.50	58,093.66	965.37	40,110.17	4,957.59	14,410.54	124,017.71
07090004 - Sugar River	0.00	12,574.33	0.00	11,699.92	659.62	2,922.68	29,377.74
07090003 - Pecatonica River	79.32	7,208.73	0.00	2,882.55	214.65	834.43	12,179.22
07090006 - Kishwaukee River	42.48	344.82	107.78	65.41	61.75	91.27	723.15
07090005 - Lower Rock-Piscasaw Creek	0.00	79.17	0.00	166.42	1.31	67.37	351.67

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07090001 - Upper Rock River	1.16%	56.93%	0.41%	25.92%	5.06%	9.40%	100.00%
07090002 - Lower Rock River	3.68%	46.84%	0.78%	32.34%	4.00%	11.62%	100.00%
07090004 - Sugar River	0.00%	42.80%	0.00%	39.83%	2.25%	9.95%	100.00%
07090003 - Pecatonica River	0.65%	59.19%	0.00%	23.67%	1.76%	6.85%	100.00%
07090006 - Kishwaukee River	5.87%	47.68%	14.90%	9.05%	8.54%	12.62%	100.00%
07090005 - Lower Rock-Piscasaw Creek	0.00%	22.51%	0.00%	47.32%	0.37%	19.16%	100.00%

**Element V. Goals and Objectives:****Existing Advanced Watershed Plans (AWP): None**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.

8. Restore, enhance, establish and/or preserve 20 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Sugar River****HUC – 07090004**

This watershed has lost approximately 58.39% of its overall historic wetlands, which is moderate for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 20.001 acres of wetland loss, which is the second highest for this service area. Permit trends do not specify the type of wetland of impact for the vast majority of permit actions. Wooded Swamps and Wet to Wet-Mesic Prairies have sustained the greatest estimated historic percentage losses at 93.81% and 71.48% respectively, followed by Sedge Meadows. Estimated historic acreage losses reinforce significant quantity losses across these categories. The overall land use within this watershed is overwhelmingly agriculture at 73.91%, with the remaining area split between natural at 17.03% and developed at 9.06%. The agriculture areas are comprised of mainly cultivated crops with some pasture/hay area, while the natural land use is comprised of mainly deciduous forest, emergent herbaceous wetlands and woody wetlands. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Wooded Swamp and Floodplain Forests. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps and Floodplain Forests will fit well within this watershed given the overall forested / emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wet to Wet-Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Kishwaukee River****HUC – 07090006**

This watershed has lost approximately 63.19% of its overall historic wetlands, which is the second highest for this service area. Corps permitted actions over the past 5 years depicts 0 acres of wetland loss. Wet to Wet-Mesic Prairie, Deep and Shallow Marshes, Sedge Meadows and Floodplain Forests have sustained the greatest estimated historic percentage losses, which are reinforced by corresponding significant estimated acreage losses. The overall land use within this watershed is overwhelmingly developed at 84.65% representing the highest program wide. The remaining land use shows agriculture at 14.45% and a mere 0.90% natural remaining. The agriculture is comprised of mostly cultivated crops while the natural land use has only a small amount of deciduous forest, woody wetlands, open water and emergent/herbaceous wetlands. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, Wet to Wet-Mesic Prairies, Seasonally Flooded Basins and Shrub Swamps. Therefore, replacing Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall highly developed and disturbed state of land use and compatible mapped

wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Fresh (Wet) Meadows, Wet to Wet Mesic Prairies and Floodplain Forests.
- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Pecatonica River****HUC – 07090003**

This watershed has lost approximately 50.91% of its overall historic wetlands, which is relatively low for this service area. Corps permitted actions over the past 5 years depicts 0.110 acres of wetland loss, which is low for this service area. Sedge Meadows and Wet to Wet-Mesic Prairie have sustained the greatest estimated historic loss percentages, followed by Wooded Swamps, Shrub Swamps and Floodplain Forests. Further review of the estimated historic acreage losses reinforces these types as having significant acreage losses. The overall land use within this watershed is mostly agriculture at 68.41% followed by developed at 19.67% leaving a relatively small natural area of 11.91%. The agriculture land use is comprised of both cultivated crops and pasture/hay areas, while the natural area is composed of deciduous forest, grassland/herbaceous, shrub/scrub and emergent herbaceous wetlands. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Wooded Swamps and Floodplain Forests. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps and Floodplain Forests will fit well within this watershed given the overall herbaceous/emergent and forested setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Wet to Wet Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Lower Rock-Piscasaw Creek****HUC – 07090005**

This watershed has lost approximately 69.88% of its overall historic wetlands, which is the highest for this service area. Corps permitted actions over the past 5 years depicts 0 acres of wetland loss. Wet to Wet-Mesic Prairies and Floodplain Forests have sustained the greatest estimated historic percentage losses at 100.00% and 69.40% respectively, which is reinforced by corresponding significant estimated acreage losses. The overall land use within this watershed is overwhelmingly developed at 79.59%, followed by agriculture at 16.36% leaving a very small 4.05% natural land area. The agriculture is comprised of mainly cultivated crops, while the natural land use is holding onto a small amount of deciduous forest, grassland/herbaceous and open water. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, Wet to Wet-Mesic Prairies, Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Fresh (Wet) Meadows and Floodplain Forests will fit well within this highly developed and disturbed watershed given the small forested and grassland/herbaceous remains and compatible mapped

wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

#### **Upper Rock River**

#### **HUC – 07090001**

This watershed has lost approximately 43.70% of its overall historic wetlands, which is the lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 82.727 acres of wetland loss, which is the highest for this service area. Permit trends show the majority (62%) of wetland impacts unspecified. Floodplain Forests and Wet to Wet-Mesic Prairies have sustained the greatest estimated historic percentage losses at 56.75% and 56.61% respectively, followed by distribution across Wooded Swamps, Shrub Swamps, Deep and Shallow Marsh and Sedge Meadows, which are reinforced by corresponding significant estimated acreage losses. The overall land use within this watershed is overwhelmingly agriculture at 75.36%, followed by natural at 24.46% leaving a very small 0.17% developed area. The agriculture is comprised of mainly cultivated crops, while the natural land use is composed of mainly deciduous forest, emergent/herbaceous wetlands, woody wetlands and open water. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, Wooded Swamps and Floodplain Forests. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall forested, emergent/herbaceous setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wet to Wet-Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

#### **Lower Rock River**

#### **HUC – 07090002**

This watershed has lost approximately 49.17% of its overall historic wetlands, which is low for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 2.104 acres of wetland loss, which is moderate for this service area. Permit trends show the majority (83%) of wetland impacts unspecified with 17% of the remaining occurring with Wooded Swamps and Floodplain Forests. Wet to Wet-Mesic Prairies and Floodplain Forests have sustained the greatest estimated historic percentage losses at 74.46% and 55.70% respectively, followed by Wooded Swamps, Deep and Shallow Marsh and Sedge Meadows. A review of the estimated historic acreage loss reinforces these types as being the greatest impacted. The overall land use within this watershed is

overwhelmingly agriculture at 74.87%, followed by natural at 25.09% leaving a very small 0.04% developed area. The agriculture is comprised of mainly cultivated crops, while the natural land use is composed of mainly deciduous forest, open water, emergent/herbaceous wetlands, woody wetlands and grassland/herbaceous areas. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, Wet to Wet-Mesic Prairies, followed by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps and Floodplain Forests will fit well within this watershed given the overall forested and emergent/herbaceous setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Wet to Wet-Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Existing Advanced Watershed Plans (AWP): None**

#### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

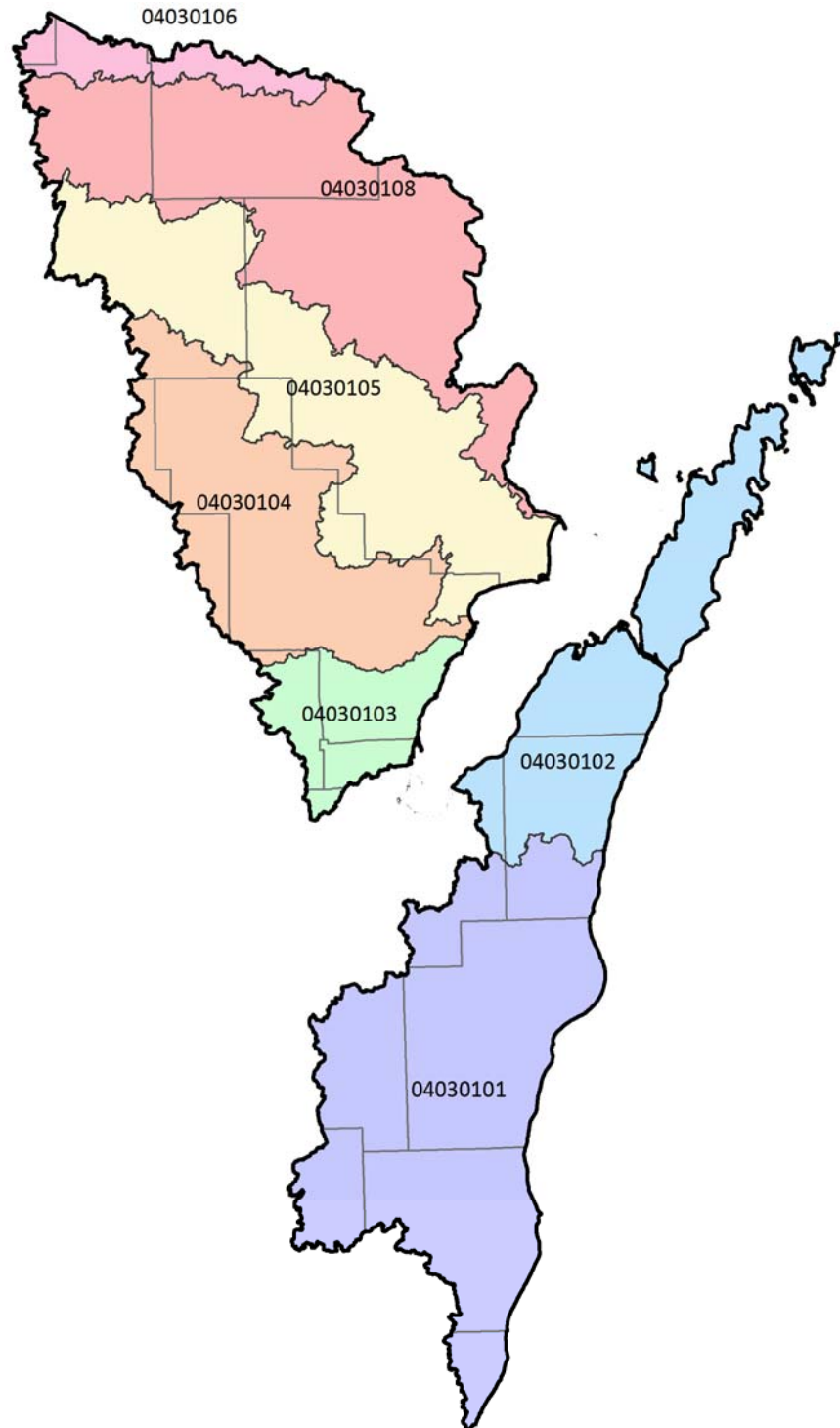
**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Northwestern Lake Michigan CPF

### Element I. Service area:

#### Overall SA Area with separate HUC-8 watersheds designated in color

(county & state boundaries shown in straight lines for further reference)

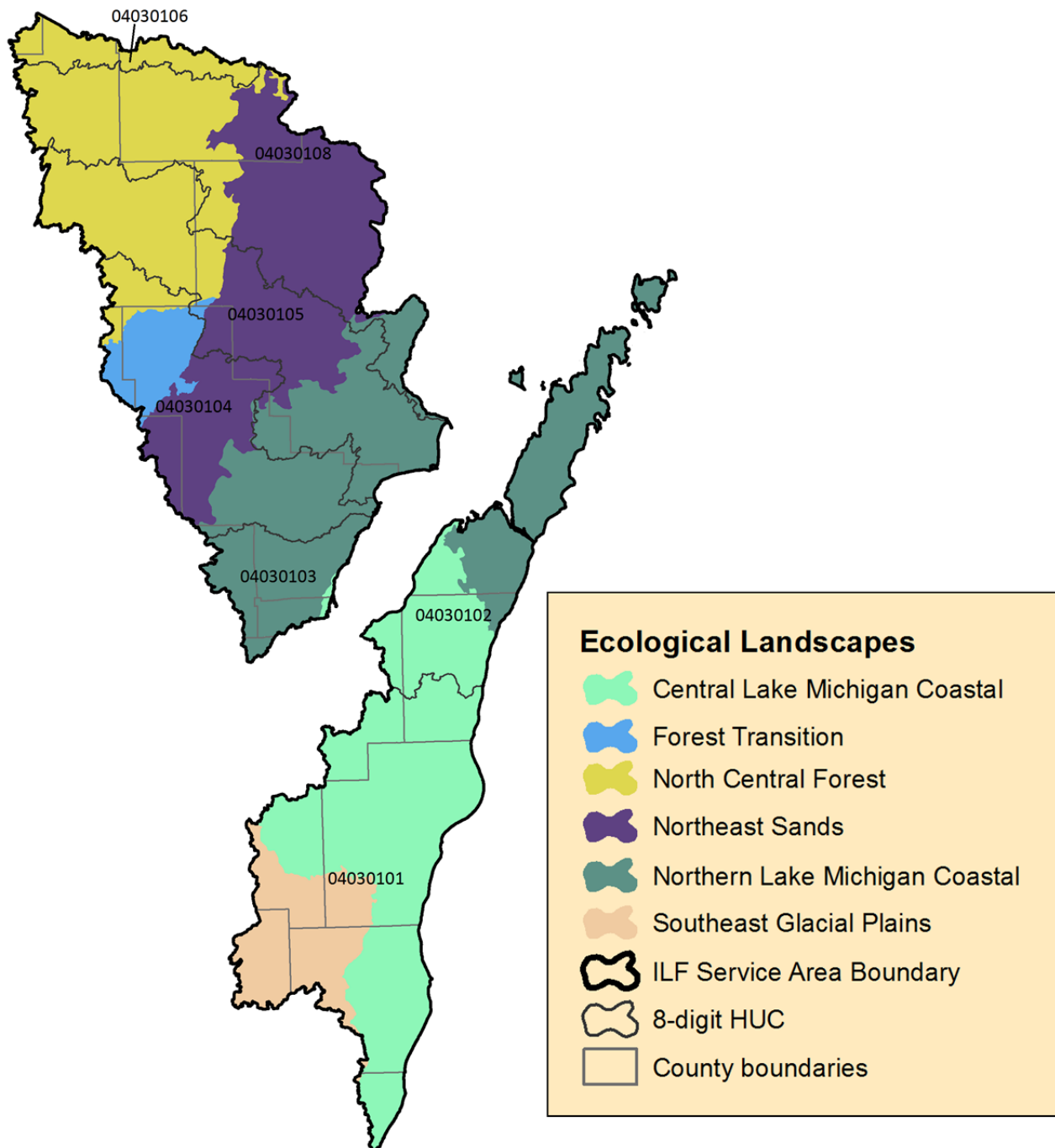


November 12, 2014

The Northwestern Lake Michigan Service area is located at the north eastern portion of Wisconsin comprised of Vilas, Forest, Florence, Langlade, Menominee, Shawano, Outagamie, Marinette, Oconto, Brown, Calumet, Fond Du Lac, Sheboygan, Ozaukee, Manitowoc, Kewaunee and Door counties and drains an area approximately 6,579 square miles.

Ecological Landscapes include (WDNR 2012):

#### Ecological Landscapes per HUC 8



**Central Lake Michigan Coastal** – The climate in the eastern part of this Ecological Landscape is moderated by its proximity to Lake Michigan, leading to warmer temperatures in the fall and early winter and somewhat cooler temperatures during spring and early summer that influence vegetation and other aspects of the ecology. Lake effect snow can occur in areas along the Lake Michigan coast during the winter. Mean growing season is 160 days (second longest in the state), mean annual temperature is 45.1 deg. F, mean annual precipitation is 31.1 (second lowest in the state), and mean annual snowfall is 43.4 inches. There is adequate rainfall and growing degree days to support agricultural row crops, small grains, and pastures which are prevalent land uses here. Landforms are mostly glacial in origin, especially till plains and moraines, reworked and overlain in the western part by Glacial Lake Oshkosh. Beach ridges, terraces, and dunes formed near the shorelines of this glacial lake when sandy sediments were present. At other locations boulder fields were formed when silts and clays were removed by wave action. Along Lake Michigan coastal ridge and swale complexes, drowned river mouths (freshwater estuaries), and clay bluffs and ravines occur. The Niagara Escarpment is a prominent bedrock feature that runs along the east sides of lower Green Bay and the Fox River Valley. Most upland soils are reddish-brown calcareous loamy till or lacustrine deposits on moraines, till plains, and lake plains. The dominant soil is loamy or clayey with a silt loam surface, with moderately slow permeability, and high available water capacity. Lake Michigan is a key ecological and socioeconomic feature. It influences the climate, created unique landforms, and is responsible in part for the presence and distribution of rare species. The shoreline constitutes a major flyway for migratory birds. Most of the major cities in this Ecological Landscape are located at the mouths of rivers entering Lake Michigan or Green Bay. Inland lakes are scarce, and all are small. The Fox River drains Lake Winnebago and runs into Green Bay. The other major rivers here run directly into Lake Michigan, and include the Ahnapee, Kewaunee, East Twin, West Twin, Manitowoc, Sheboygan, and Milwaukee. Agriculture is the dominant land use here by area, and there are several medium sized cities. Some large forested wetlands occur in both the eastern and western parts of the Ecological Landscape. The Wolf River bottoms are especially important in the west. Extensive marshes persist in southwestern Green Bay. The ridge and swale complex at Point Beach contains the largest area of coastal forest (with associated wetlands, dunes, and beaches) and constitutes an extremely important repository of regional biodiversity. Population is estimated at 814,770, comprising 14.5% of the state total resulting in a population density of approximately 199 persons/ sq. mile. Public lands include Point Beach State Forest, Harrington Beach and Kohler-Andrae State Parks, several State Wildlife Areas (including several units of Green Bay West Shores, C. D. Besadny, Collins Marsh, Brillion Marsh, and Navarino), State Fishery Areas, and State Natural Areas.

**Forest Transition** – Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the "Tension Zone") that runs southeast-northwest across the state. The mean growing season is 133 days, mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The growing season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. The Forest Transition was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material

deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Most soils are non-calcareous, moderately well-drained sandy loams derived from glacial till, but there is considerable diversity in the range of soil attributes. The area includes sandy soils formed in outwash, as well as organic soils, and loam and silt loam soils on moraines. There are many areas with shallow soils. Drainage classes range from poorly drained to excessively drained. Density of the till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition. Soils throughout the Ecological Landscape have silt loam surface deposits formed in aeolian loess, about 6 to 24 inches thick in much of the area. Major river systems draining this Ecological Landscape include the Wolf, Wisconsin, Black, Chippewa, and St. Croix. Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the Ecological Landscape remains heavily forested, the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared), and the west end is a mixture of forest, lakes, and agricultural land. Population is estimated at 639,625, comprising 11.4% of the state total resulting in a population density of approximately 49 persons/ sq. mile. About 88% of all forested land is privately-owned while 12% belongs to the state, counties or municipalities.

**North Central Forest** – Typical of northern Wisconsin, mean growing season in the North Central Forest is 115 days, the shortest growing season of all Ecological Landscapes in the state. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean annual snowfall is 63 inches. However, heavier snowfall can occur closer to Lake Superior, especially in the northwestern part of the Ecological Landscape in the topographically higher Penoque-Gogebic Iron Range. The cool temperatures and short growing season are not conducive to supporting agricultural row crops such as corn in most parts of the Ecological Landscape. Only six percent of the North Central Forest is in agricultural use. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penoque-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands. Rivers, streams, and springs are common and found throughout this Ecological Landscape. Major rivers include the Wisconsin, Chippewa, Flambeau, Jump, Wolf, Pine, Popple, and Peshtigo. Large lakes include Namekagon, Courte Oreilles, Owen, Round, Butternut, North Twin, Metonga, Pelican, Pine, Kentuck, Pickerel, and Lucerne. Several large man-made flowages occur here such as the Chippewa, Turtle-Flambeau, Gile, Pine, and Mondeaux. There are several localized but significant concentrations of glacial kettle lakes associated with end and recessional moraines (e.g., the Perkinstown, Bloomer, Winegar, Birchwood Lakes, and Valhalla/Marenisco Moraines.) In southern Ashland and Bayfield counties, the concentrations of lakes are associated with till plains or outwash over till. Lakes here are due to dense till holding up the water table. Rare lake types in the North Central

Forest include marl and meromictic lakes. Forests cover approximately 75% of this Ecological Landscape. The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack), non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marsh (including wild rice marshes) are widespread in the North Central Forest. Population is estimated at 244,782, comprising 4.4% of the state total resulting in a population density of approximately 19 persons/ sq. mile. Forty-two percent is publicly owned, mostly by federal, state or county governments.

**Northeast Sands** – The short growing season (122 days) is similar to other northern Ecological Landscapes and limits yield potential for row crop agriculture. January minimum temperatures average higher than other northern Ecological Landscapes. The average August maximum temperature (78.8o) is the third coolest of any other Ecological Landscape in the state. The Green Bay Lobe covered this Ecological Landscape during the last part of the Wisconsin Glaciation. As the Green Bay Lobe melted and retreated eastward, outwash was deposited over lower-lying surface features, so the Ecological Landscape now appears as a nearly level to rolling sandy outwash plain, pitted in places, with sandy heads-of-outwash and loamy moraines protruding through the outwash sediment. Heads-of-outwash, uncommon in most of Wisconsin, are a distinctive glacial feature here. A series of north-south trending morainal and head-of-outwash hills runs the length of the west side of this Ecological Landscape. They are oriented in roughly parallel positions, marking the outer extent of Green Bay Lobe deposits in northeastern Wisconsin. Most upland soils formed in acid outwash sand on outwash plains or outwash heads. The dominant soil is excessively drained and sandy with a loamy sand surface, rapid permeability, and very low available water capacity. More than half the land surface is made up of outwash sand and gravel. Glacial till deposits here have pH values that are neutral to calcareous, unlike the acid tills of most of northern Wisconsin, because dolomite was incorporated into the till as glaciers passed over the Niagara Escarpment. Rivers and streams include the Menominee, Peshtigo, Pike, Pine, Oconto, South Branch of the Oconto, and Wolf rivers. Scattered lakes are present, with local concentrations of small lakes in the far north, far south, and the northeast. Several large impoundments have been constructed, such as those on the Menominee and Peshtigo rivers. Hwy 64 bisects the Brazeau Swamp, one of Wisconsin's largest cedar swamps, disrupting its hydrology and altering composition and function. A large portion of this swamp was cleared and drained and is now a "muck farm" used to grow vegetables. Forests cover about 75% of this Ecological Landscape. Aspen is the most abundant cover type, and dry forests dominated by scrub-oak and jack pine are common. Plantation-grown pine, hemlock-hardwoods and northern hardwoods are also among the important upland cover types. Common lowland communities include wet-mesic forests dominated by northern white cedar, black spruce-tamarack swamps, and alder-dominated shrub swamps. Agriculture (only 7% of the area) is concentrated mostly in the southeastern and northernmost portions of the Ecological Landscape. Population is estimated at 89,421, comprising 1.6% of the state total resulting in a population density of approximately 27 persons/ sq. mile. Notable properties include the Chequamegon-Nicolet National Forest, Peshtigo River State

Forest, Governor Tommy Thompson State Park, Peshtigo Brook State Wildlife Area, the Pine-Popple Wild Rivers, the Menominee River Natural Resources Area, and scattered State Natural Areas, including Dunbar Barrens and Spread Eagle Barrens.

**Northern Lake Michigan Coastal** – Cold winters and warm summers are moderated by the thermal mass of Lake Michigan, especially in coastal areas. The mean growing season is 140 days, mean annual temperature is 42.8 deg. F, mean annual precipitation is 32.1, and mean annual snowfall is 46 inches. Lake effect snow can be significant, especially along Lake Michigan. Rainfall and growing degree days are adequate to support agricultural row crops, small grains, hay and pastures. Warmer temperatures near Lake Michigan in fall and early winter and slightly cooler temperatures during spring and early summer are favorable for growing cherries, apples, and other fruits on the Door Peninsula. The Niagara Escarpment is a prominent bedrock ridge of Silurian dolomite that is exposed as cliffs and ledges along the western edge of the Door Peninsula and in the Grand Traverse Islands. The same bedrock is also exposed at many locations along the east side of the northern Door Peninsula, where it forms broad, nearly level bedrock shorelines. A broad, level lacustrine plain occurs in areas bordering the west shore of Green Bay, where an extensive delta has been created at the mouth of the Peshtigo River. Landforms along the Lake Michigan shore include beaches, dunes, baymouth bars, and complex ridge and swale topography. Embayment lakes and freshwater estuaries are also characteristic of the Lake Michigan shore. Elsewhere in this Ecological Landscape, ground moraine is the dominant landform. Soils are diverse; in some areas, lacustrine sands are found overlying clays, or bedrock which is within a few feet of the surface. On the Door Peninsula soils are calcareous, typically stony loamy sands to loams. Shallow soils and exposures of dolomite bedrock are frequent near the Lake Michigan and Green Bay coasts. Poorly drained sands are common in the lake plain west of Green Bay and in depressions between dunes and beach ridges. Beyond the lake plain west of Green Bay, the ground moraine is composed mostly of moderately well-drained, rocky sandy loams, interspersed with lacustrine sands and clays. Peats and mucks are common along the west shore of Green Bay and in the northwestern part of the Ecological Landscape. There is an area of sandy soils between Stiles and Oconto Falls west of Green Bay. Chambers Island has "sandy, gravelly, clayey soils". Lake Michigan is cold, deep, oligotrophic, and relatively clean; Green Bay, an estuary that is also the largest bay on Lake Michigan, is warm, shallow, productive, and dynamic. It has been heavily polluted, especially by industries that formerly dumped wastes into the Fox River at the head of the bay (which is within the Central Lake Michigan Coastal Ecological Landscape). The larger rivers that flow through this Ecological Landscape into Green Bay include the Menominee, Oconto, Peshtigo, and Pensaukee. These rivers and their tributaries drain the uplands west of Green Bay before passing through the extensive wetlands along Green Bay's west shore. Several large embayment lakes (e.g., Clark, Europe, and Kangaroo lakes) occur along the east side of the northern Door Peninsula. There are few large inland lakes. Several impoundments constructed on rivers west of Green Bay had been subjected to high levels of pollution from past industrial activity. On the Door Peninsula there have been serious groundwater contamination problems from agricultural pesticides and manure. These pollutants were able to reach the groundwater through the fractured dolomite bedrock. The lower Wolf River drains the westernmost part of this Ecological Landscape. Historically, the uplands were almost entirely covered by forest. Today, more than 64% is non-forested. Most of this land is now in agricultural crops (51%), with smaller amounts of grassland (5.6%), non-forested wetlands (6.1%), shrubland 0.1%),

and urbanized areas (0.8%). The most abundant cover type in the forested uplands (262,119 acres or 20.4% of the Ecological Landscape) is maple-basswood, with smaller amounts of aspen-birch. Forested wetlands (mostly lowland hardwoods, with some conifer swamps) cover slightly over 14% of the area. Other cover types are comparatively scarce but of high importance ecologically, and include maple-beech, hemlock-hardwoods, white pine, and mixtures of boreal conifers (dominants include white spruce-balsam fir-white pine-white cedar). Important non-forested wetland communities include marsh, sedge meadow, and shrub swamp. Population is estimated at 148,920, comprising 2.7% of the state total resulting in a population density of approximately 39 persons/ sq. mile. Only about 3.5% of the Ecological Landscape is public land.

**Southeast Glacial Plains** – Typical of southern Wisconsin; mean growing season of 155 days, mean annual temperature is 45.9 deg. F, mean annual precipitation is 33.6 inches, and mean annual snowfall is 39.4 inches. The climate is suitable for agricultural row crops, small grains, and pastures, which are prevalent in this Ecological Landscape. The dominant landforms are glacial till plains and moraines composed mostly of materials deposited during the Wisconsin Ice Age, but the southwestern part of the Ecological Landscape consists of older, pre-Wisconsin till and the topography is more dissected. Other glacial landforms, including drumlins, outwash plains, eskers, kames and kettles are also well-represented kames, eskers, and kettles. The "Kettle Moraine" is an area of rough topography on the eastern side of the Southeast Glacial Plains that marks the areas of contact between the Green Bay and Lake Michigan glacial lobes. Numerous excellent examples of glacial features occur and are highly visible in the Kettle Moraine. Soils are derived from lime-rich tills overlain in most areas by a silt-loam loess cap. The Southeast Glacial Plains has the highest aquatic productivity for plants, insects, other invertebrates, and fish of any Ecological Landscape in the state. Significant river systems include the Wolf, Bark, Rock, Fox, Milwaukee, Sugar, Mukwonago, and Sheboygan. Most riparian zones have been degraded. Several clusters of large lakes exist, including the Yahara chain of lakes in and around Madison, and the Lake Winnebago Pool system. Kettle lakes occur within end moraines, in outwash channels, and in ancient riverbeds. This Ecological Landscape contains some huge marshes, as well as fens, sedge meadows, wet prairies, tamarack swamps, and floodplain forests. Many wetlands here have been affected by hydrologic modifications (ditching, diking, tiling), grazing, infestations of invasive plants, and excessive inputs of sediment- and nutrient-laden runoff from croplands. Primarily agricultural cropland (58% of Landscape). Remaining forests occupy only 11% of the land area and major cover types include maple-basswood, oak, lowland hardwoods, and conifer swamps (mostly tamarack-dominated). No large areas of upland forest exist except on the Kettle Interlobate Moraine, where the topography is too rugged to practice intensive agriculture and the soils are not always conducive to high crop productivity. Wetlands are extensive (12% of Landscape, 593,248 acres) and include large marshes and sedge meadows, and extensive forested lowlands within the Lower Wolf River floodplain. Forested lowlands are also significant along stretches of the Milwaukee, Sugar, and Rock rivers. Population is estimated at 1,519,000, comprising 28.5% of the state total resulting in a population density of approximately 204 persons/ sq. mile. Only four percent of the Southeast Glacial Plains is in public ownership (226,230 acres), of which 58% is wetland and 42% is upland.

This SA can be further broken down into seven smaller HUC-8 watersheds, the Manitowoc-Sheboygan Rivers (04030101), Door-Kewaunee Rivers (04030102), Pensaukee River (04030103), Oconto River (04030104), Peshtigo River (04030105), Menominee River (04030108) and Brule River (04030106). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

## **Element II. Threats:**

Overall wetland resource threats within this service area include a very high rate of agricultural activity and development in the southern extents, groundwater depletion in the southern and northeastern portions, water quality in the southern and northeastern regions resulting in 303d listed impaired waters, invasive species in the south and coastal areas, fragmentation of corridors and land use changes affecting shoreline areas. The north/northwestern lobe of this service area (North Central Forests, Forest Transition, Northeast Sands **WDNR 2012**) is wrangling with the roles played by and ecological relationships among public, private, industrial, and tribal lands from a conservation, socioeconomic, and recreational perspectives. In recent years there has been documentation of widespread negative impacts to forests from: excessive deer browse; invasive earthworms, insects, plants and pathogens; divestitures of large private holdings (especially estates and industrial forests); increased parcelization; and the development of shoreline habitats. Other important factors to consider include: the potential implications of climate change; ecological impacts of increased biomass harvest; forest type conversions; forest simplification and homogenization of resource types. Hydrologic modifications from dams also threaten wetland resource conditions in this landscape. Invasive species, especially along coastal areas, are well established and pose a significant threat to vegetative biodiversity. The central portions and northeastern lobe of this service area (Northern Lake Michigan Coastal **WDNR 2012**) have changed dramatically over the past decades resulting in a highly adaptive landscape. Pollutants in the Green Bay area have placed serious constraints on conservation efforts and negatively affected shoreline ecosystems and lead towards many 303d listed impaired waterways throughout this region. Invasive species have spread rapidly from a high density of tourists, commercial ships from global destinations and roadways. The southern extents of this service area (Central Lake Michigan, Southeast Glacial Plains **WDNR 2012**) have been severely impacted from agriculture and development pressures that have fragmented forested landscapes. Groundwater withdrawals threaten to deplete hydrologic reserves. Impaired waterways are numerous and invasive species have taken a strong hold in this area posing a major problem. Impervious surfaces are also largely present in the southern areas threatening sensitive resources from increased runoff, thermal impacts and pollutant loading.

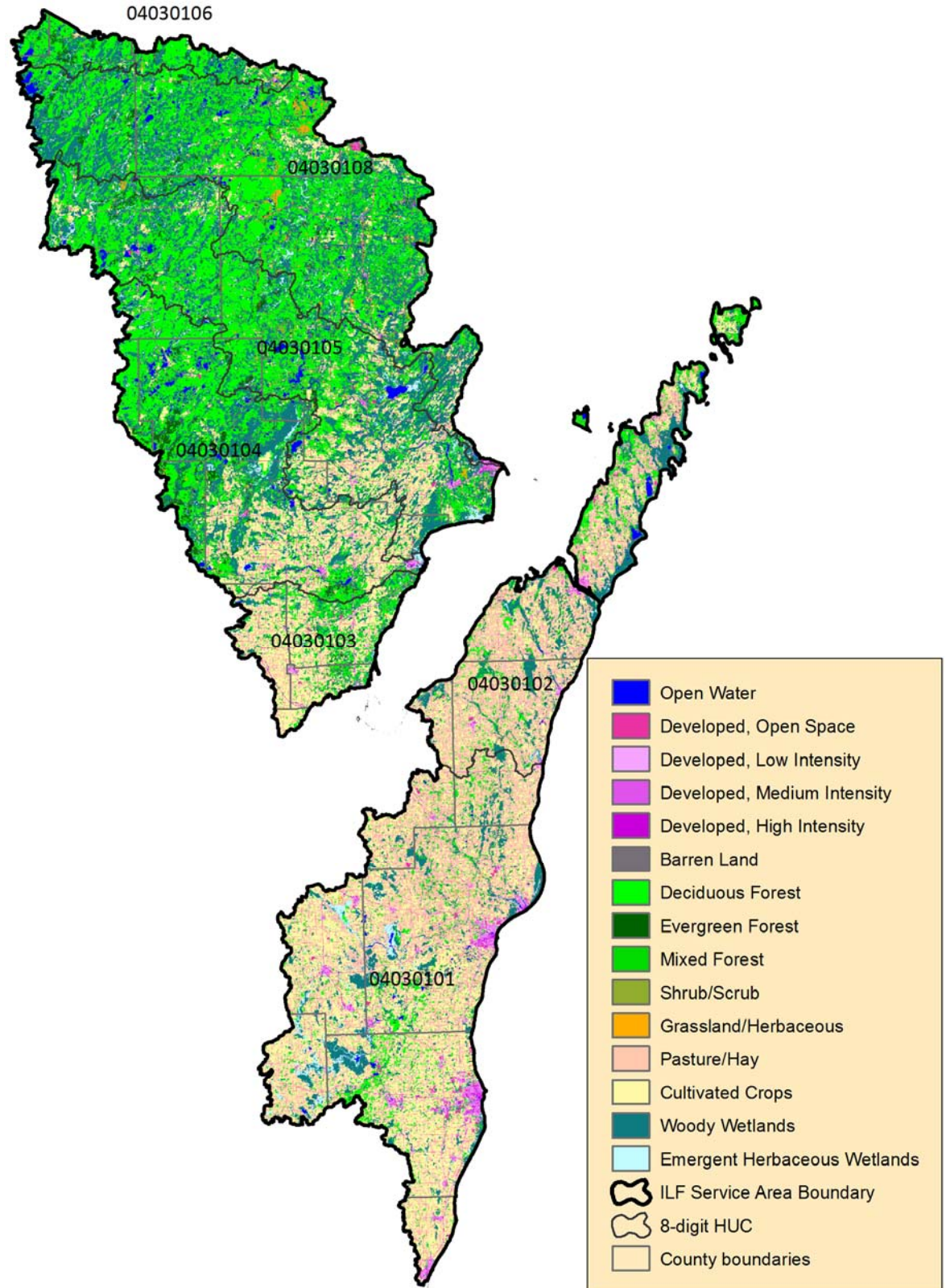
The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an

increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

**Current Land Use:**

**Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



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**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
04030101 - Manitowoc-Sheboygan Rivers	1,042,318	100,268	713,155	228,895	9.62%	68.42%	21.96%
04030102 - Door-Kewaunee Rivers	489,670	36,889	287,445	165,336	7.53%	58.70%	33.76%
04030103 - Pensaukee River	212,861	15,329	117,972	79,559	7.20%	55.42%	37.38%
04030104 - Oconto River	614,694	30,907	132,964	450,823	5.03%	21.63%	73.34%
04030106 - Brule River	146,350	31,833	3,833	110,684	21.75%	2.62%	75.63%
04030105 - Peshtigo River	780,183	37,411	127,372	615,400	4.80%	16.33%	78.88%
04030108 - Menominee River	833,434	3,694	39,469	790,271	0.44%	4.74%	94.82%

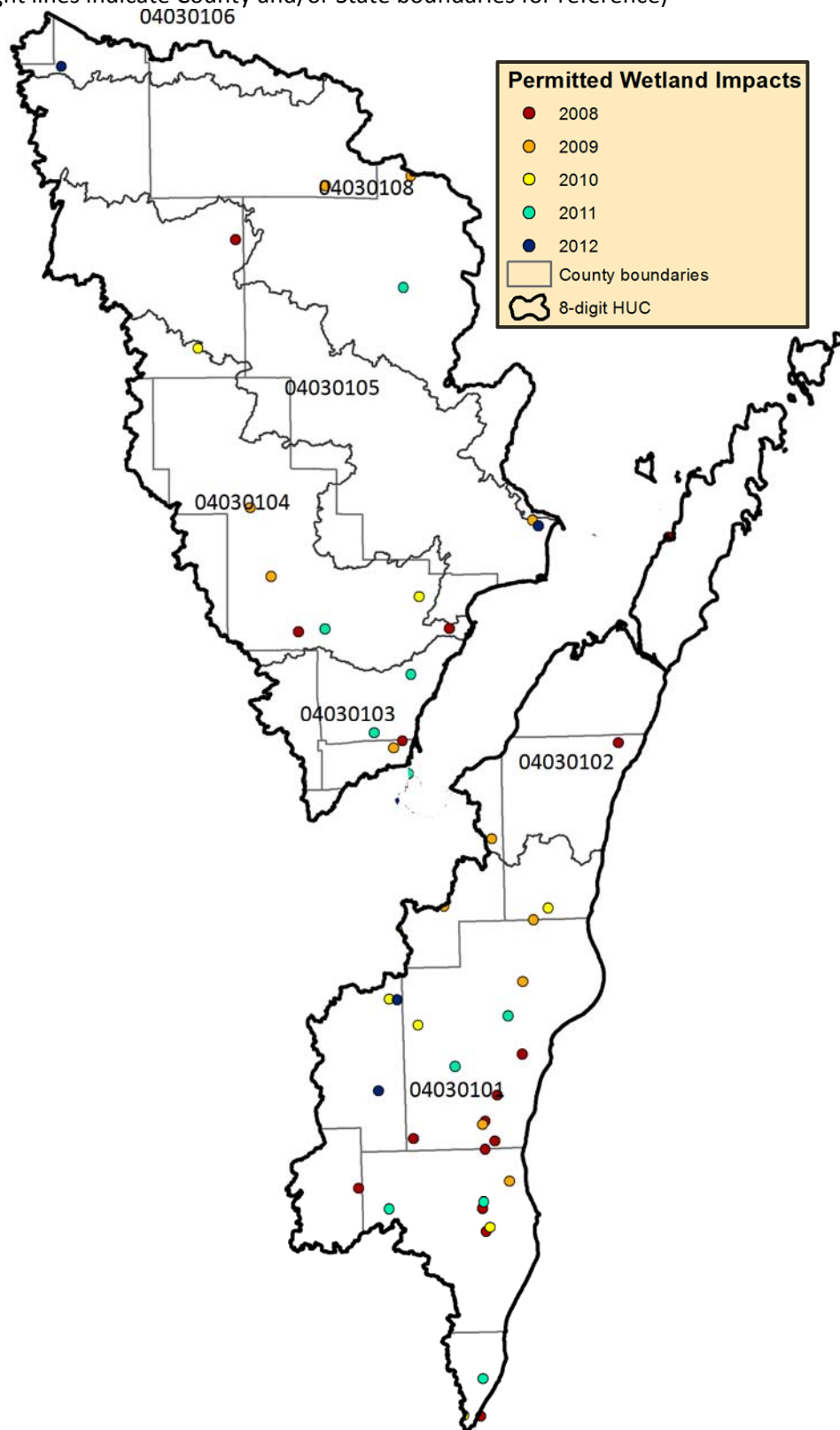
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Manitowoc-Sheboygan Rivers HUC-04030101 is under the greatest threat from agricultural activities with 68.42% of its area containing agriculture based land uses and only 21.96% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



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**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
04030104 - Oconto River	0%	0%	4%	1%	78%	17%	137.706
04030103 - Pensaukee River	56%	0%	4%	3%	37%	1%	120.375
04030101 - Manitowoc-Sheboygan Rivers	43%	0%	39%	5%	9%	4%	27.821
04030105 - Peshtigo River	1%	0%	23%	0%	18%	59%	2.951
04030108 - Menominee River	0%	36%	0%	0%	0%	64%	2.663
04030106 - Brule River	0%	0%	0%	0%	100%	0%	0.492
04030102 - Door-Kewaunee Rivers	100%	0%	0%	0%	0%	0%	0.3

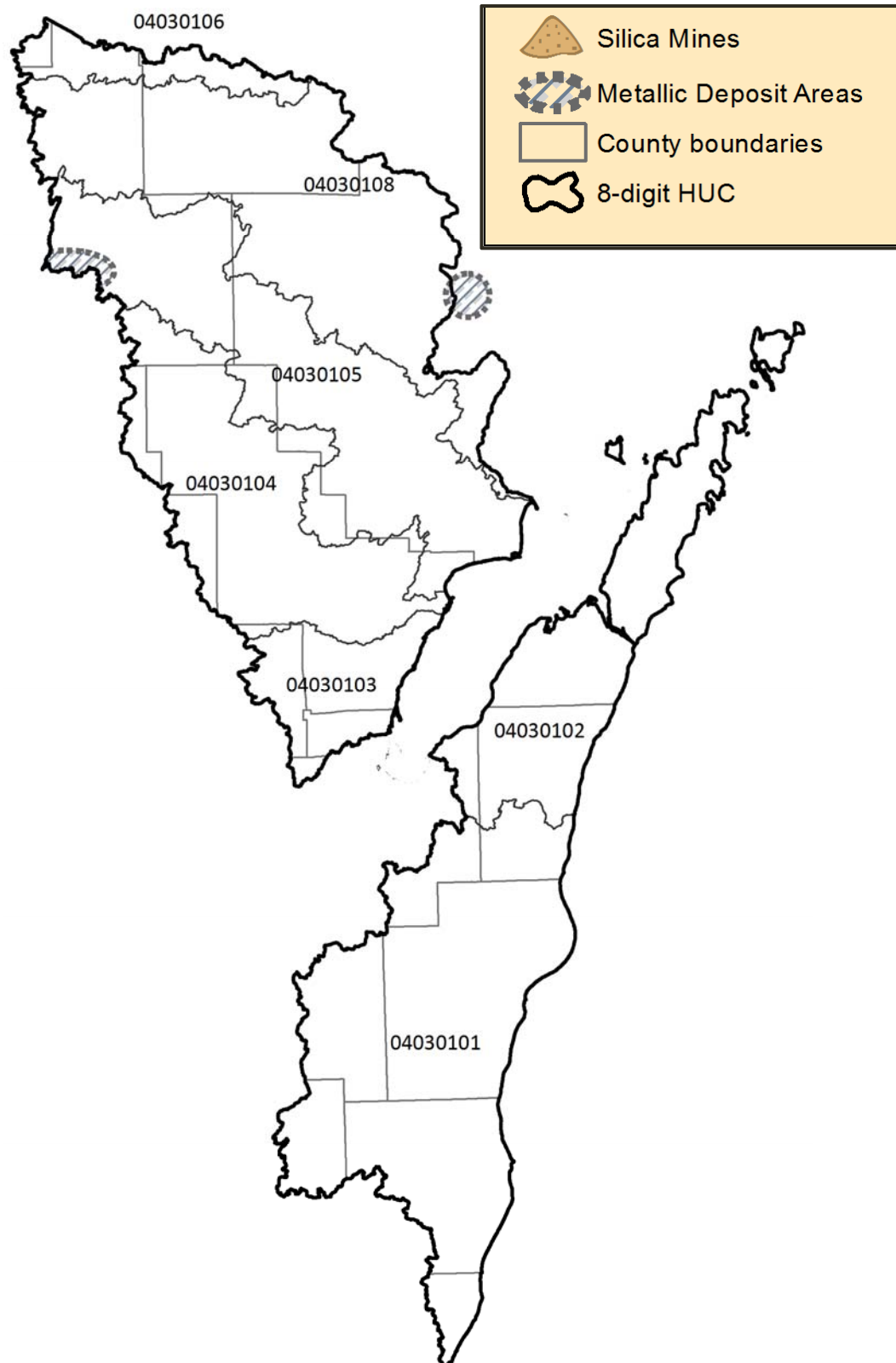
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

While the Northwestern Lake Michigan SA does not intersect with any foreseen non-metallic mining, it does contain portions of the Crandon Deposit, which generally refers to a 55 million ton ore containing zinc, copper, lead, gold and silver. If developed this mine would be an underground mine with approximately 55 acres of surface impact. This deposit falls within the Peshtigo River HUC-04030105 thus presenting an increased future threat within this watershed giving greater priority to this HUC-8 watershed.

**Potential Mining Impacts per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

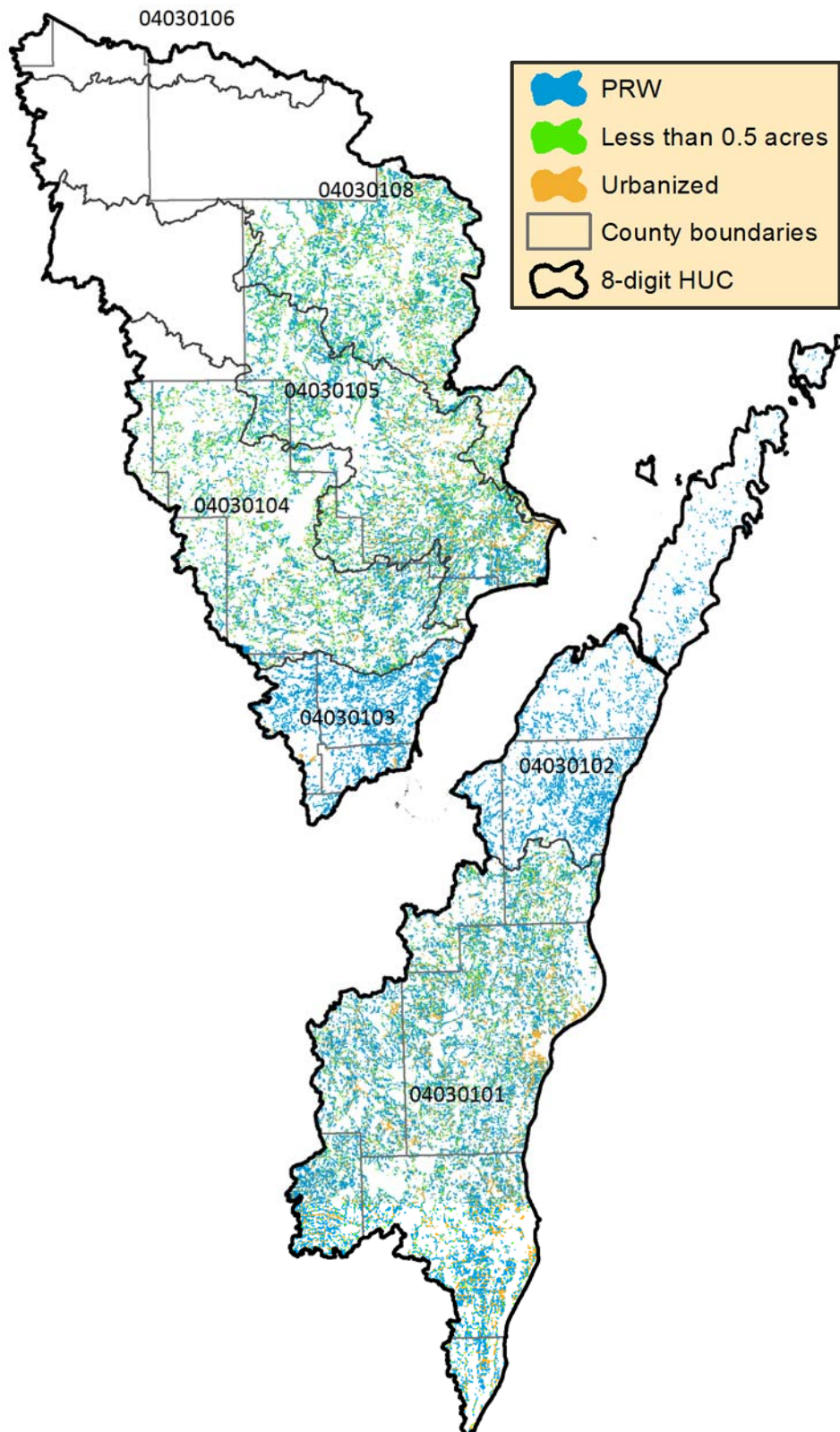


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**Element III. Historic Loss:**

This Service area's settlement was centered initially on the timber industry as settlers moved into this area rich in its shore line areas that provided natural harbors for transporting goods and people. As saw mills began dotting the landscape so did commercial fishing and shipbuilding, which brought more people to the area leading to typical anthropogenic adverse impacts. Original vegetation in the northern portions of the watershed was heavy with hemlock providing the catalyst for the tanning industry. After forested areas were cleared agriculture moved in as the dominating force altering the wetland landscape followed by the adverse effects of an increasing population (***WDNR Basin Website 2013***). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Overall Estimated Historic Wetland Percent Loss Summary**

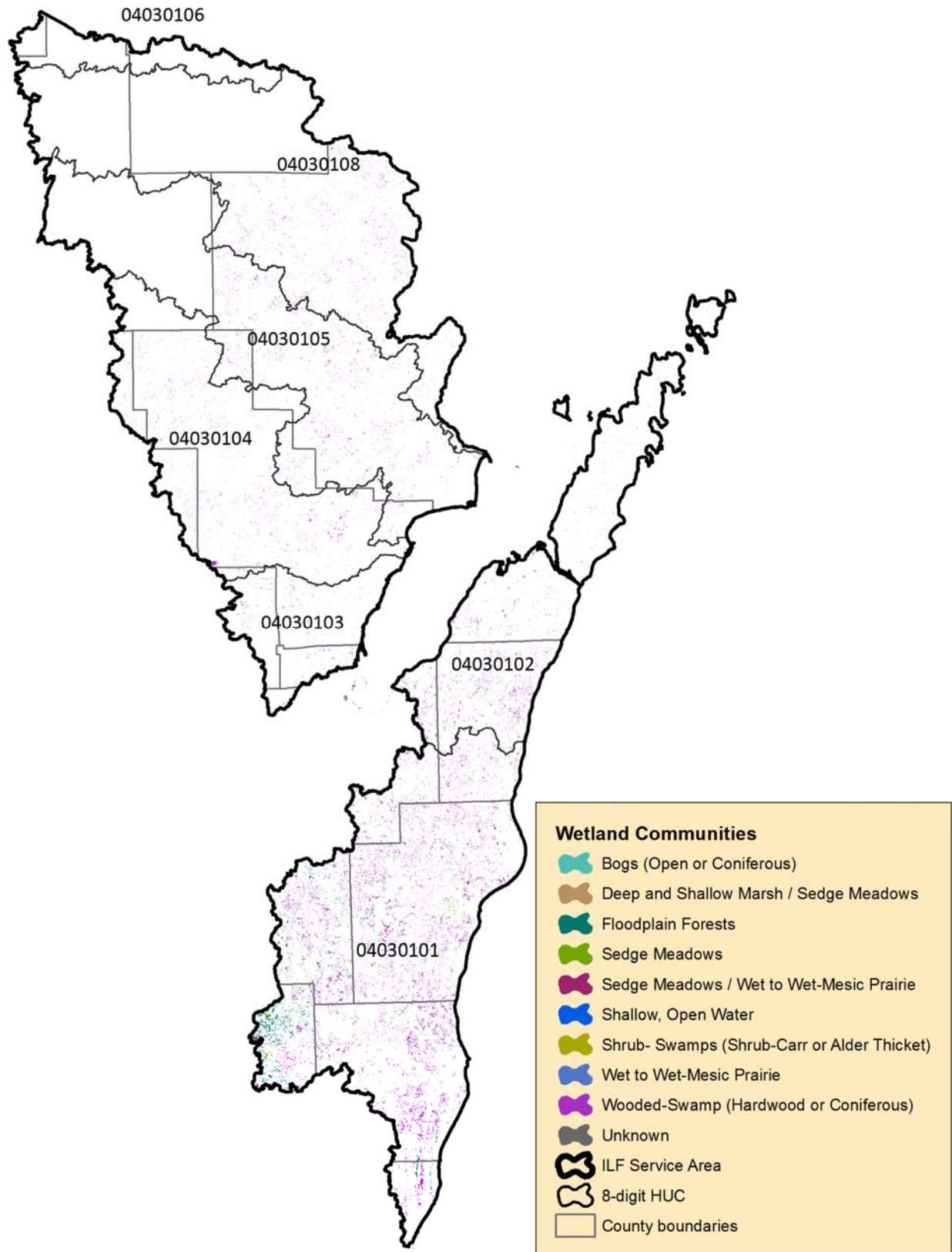
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
04030101 - Manitowoc-Sheboygan Rivers	56,509	30.13%
04030103 - Pensaukee River	11,301	20.21%
04030102 - Door-Kewaunee Rivers	11,128	12.45%
04030105 - Peshtigo River	16,616	12.02%
04030108 - Menominee River	9,905	10.66%
04030104 - Oconto River	11,903	9.87%

The information above identifies the Manitowoc-Sheboygan Rivers HUC-04030101 and Pensaukee River HUC-04030103 as having sustained the greatest historic loss of wetlands. However, Forest County and Florence County do not currently have digitally available WWI or PRW data, which affects portions of Menominee River HUC-04030108, Peshtigo River HUC-04030105 and Oconto River HUC-04030104. Therefore, when establishing the priority HUC-8 watershed to target for mitigation projects greater weight was placed upon the other threats factors such as land use, permit trends and future threats.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
04030101 - Manitowoc-Sheboygan Rivers	12.85%	3.56%	30.59%	48.01%	81.39%	7.61%	52.50%	23.06%	74.83%	30.98%
04030103 - Pensaukee River	0.08%	#DIV/0!	#DIV/0!	8.61%	#DIV/0!	2.17%	3.22%	#DIV/0!	#DIV/0!	7.21%
04030102 - Door-Kewaunee Rivers	0.03%	#DIV/0!	26.20%	8.14%	#DIV/0!	0.58%	0.86%	#DIV/0!	#DIV/0!	11.01%
04030105 - Peshtigo River	0.01%	#DIV/0!	2.51%	3.74%	#DIV/0!	5.48%	0.00%	#DIV/0!	#DIV/0!	6.79%
04030106 - Brule River	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	100.00%
04030108 - Menominee River	0.01%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3.06%	#DIV/0!	#DIV/0!	#DIV/0!	6.34%
04030104 - Oconto River	0.01%	#DIV/0!	#DIV/0!	3.06%	#DIV/0!	4.60%	#DIV/0!	#DIV/0!	#DIV/0!	5.77%

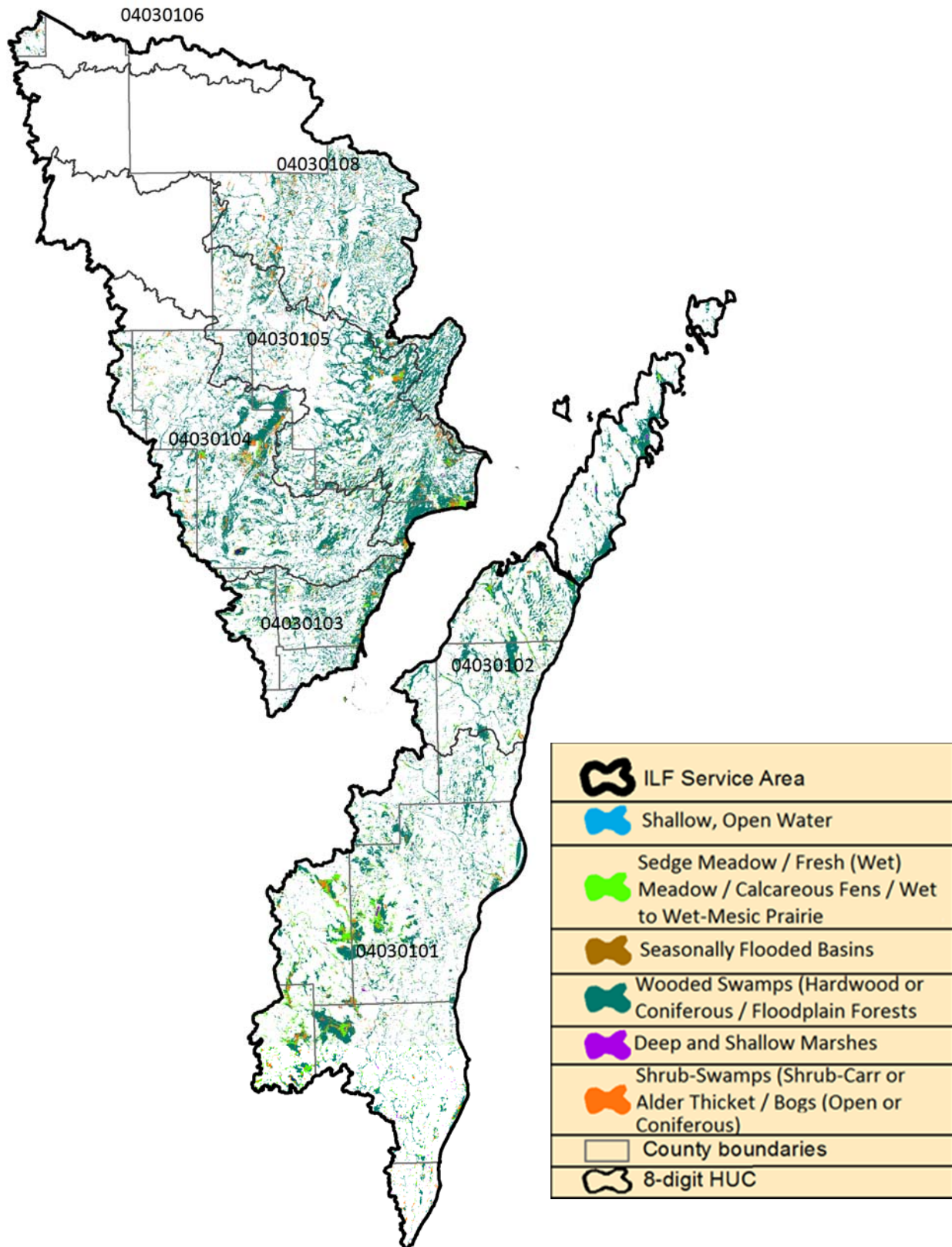
The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

**Element IV. Current Conditions:**

The 8 digit HUC's within the Northwest Lake Michigan all ultimately drain into Lake Michigan and include several large urbanized city centers, but is still dominated by rural agriculture activities. Glaciers sculpted this area, which is dominated by Niagara limestone formation and contains the longest stretch of Lake Michigan shore line compared with all other Service areas. Areas of interest include the wildlife sensitive bay area and peninsula offering a unique opportunity for shoreline and coastal wetlands. Land use is somewhat spread between natural areas and agriculture with dense pockets of urban development. There are also significant areas hosting large percentages of classified coldwater streams in the northern portions fed by networks of groundwater discharges. Tourism, manufacturing and agriculture dominate the overall watershed with increased natural resources threats stemming from agricultural activities and increased development interest in this SA (**WDNR Basin Website 2013**). WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04030101 - Manitowoc-Sheboygan Rivers	35.43	34,828.11	184.97	105,281.23	2,932.15	13,773.10	157,542.17
04030105 - Peshtigo River	92.98	8,057.47	1.01	128,023.99	970.58	13,596.92	150,873.08
04030104 - Oconto River	115.85	7,603.35	18.50	107,157.39	1,956.04	12,487.21	129,376.90
04030108 - Menominee River	100.03	3,169.17	27.79	89,904.35	784.14	9,244.61	103,233.08
04030102 - Door-Kewaunee Rivers	28.15	8,786.78	0.00	69,559.15	676.25	4,174.82	83,226.60
04030103 - Pensaukee River	0.00	4,957.25	0.00	38,610.57	481.60	4,252.66	48,378.57

**Relative Frequency of major wetland category types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04030101 - Manitowoc-Sheboygan Rivers	0.02%	22.11%	0.12%	66.83%	1.86%	8.74%	100.00%
04030105 - Peshtigo River	0.06%	5.34%	0.00%	84.86%	0.64%	9.01%	100.00%
04030104 - Oconto River	0.09%	5.88%	0.01%	82.83%	1.51%	9.65%	100.00%
04030108 - Menominee River	0.10%	3.07%	0.03%	87.09%	0.76%	8.96%	100.00%
04030102 - Door-Kewaunee Rivers	0.03%	10.56%	0.00%	83.58%	0.81%	5.02%	100.00%
04030103 - Pensaukee River	0.00%	10.25%	0.00%	79.81%	1.00%	8.79%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.

6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.
8. Restore, enhance, establish and/or preserve 25 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Pensaukee River****HUC-04030103**

This watershed has lost approximately 20.21% of its overall historic wetlands, which is the second highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 120.375 acres of wetland loss, which is the second highest for this service area. Permit trends do not specify wetland type for most (56%) of the impacts, but do list Wooded Swamps/Floodplain Forest as under pressure with 37% of wetland impacts. Sedge Meadows and Wooded Swamps have sustained the greatest estimated historic percentage losses at 8.61% and 7.21% respectively, followed by Shrub Swamps at 3.22%. Estimated historic acreage losses reinforce quantity losses across these categories. The overall land use within this watershed is mainly agriculture at 55.42%, with natural at 37.38% and developed at 7.20%. The agriculture areas are comprised of mainly cultivated crops with some pasture/hay area, while the natural land use is comprised of mainly deciduous forest, woody wetlands and emergent herbaceous with some shrub/scrub areas. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Shrub Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps and Shrub Swamps will fit well within this watershed given the overall forested / emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Interdunal and Open Bog.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps (Hardwood or Coniferous) and Shrub Swamps Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Interdunal and Open Bog.

**Manitowoc-Sheboygan Rivers HUC-04030101**

This watershed has lost approximately 30.13% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting

good opportunity for project development. Corps permitted actions over the past 5 years depicts 27.821 acres of wetland loss, which is moderate for this service area. Permit trends do not specify wetland type for most (43%) of the impacts, but do indicate Deep and Shallow Marshes, Wooded Swamps/Floodplain Forest, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairie and Shrub Swamps as the top types under pressure from wetland impacts. Wet to Wet-Mesic Prairie, Sedge Meadows and Shrub Swamps have sustained the greatest estimated historic percentage losses. Estimated historic acreage losses reinforce significant quantity losses across these categories. The overall land use within this watershed is overwhelmingly agriculture at 68.42%, with the remaining area comprised of natural at 21.96% and developed at 9.62%. The agriculture areas are split between cultivated crops and some pasture/hay area, while the natural land use is comprised of mainly deciduous forest, woody wetlands and emergent herbaceous wetlands. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Shrub Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Shrub Swamps will fit well within this watershed given the overall forested / emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

**Oconto River****HUC-04030104**

This watershed has lost approximately 9.87% of its overall historic wetlands, which is the lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 137.706 acres of wetland loss, which is the highest for this service area. Permit trends show Wooded Swamps/Floodplain Forests and Shrub Swamps under the greatest pressure from impacts at 78% and 17% losses respectively. Wooded Swamps, Shallow Open Water and Sedge Meadows have sustained the greatest estimated historic percentage losses for this watershed. Estimated historic acreage losses reinforce quantity losses across these categories. The overall land use within this watershed is overwhelmingly natural at 73.34%, followed by agriculture at 58.70% and developed at 5.03%. The natural areas are comprised of mainly deciduous forest, woody wetlands, evergreen forest, mixed forest, open water and emergent/herbaceous wetlands, while the agriculture is mainly cultivated crops with some pasture/hay area. Current mapped wetlands are dominated by Wooded Swamps and Floodplain Forests, followed by Shrub Swamps. Therefore, replacing Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall forested setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

**Door-Kewaunee Rivers HUC-04030102**

This watershed has lost approximately 12.45% of its overall historic wetlands, which is moderate for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 0.3 acres of wetland loss, which is the lowest for this service. Permit trends do not specify the type of wetland of impact for the permit actions. Floodplain Forest and Wooded Swamps have sustained the greatest estimated historic percentage losses at 26.20% and 11.01% respectively, followed by Sedge Meadows at 8.14%. Estimated historic acreage losses reinforce significant quantity losses across these categories. The overall land use within this watershed is comprised of agriculture at 58.70%, natural at 33.76% and developed at 7.53%. The agriculture areas are comprised of mainly pasture/hay areas, while the natural land use is comprised of mainly deciduous forest, woody wetlands and mixed forest. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies. Therefore, replacing Wooded Swamps, Floodplain Forests, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall forested setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous), Floodplain Forests, Sedge Meadows and Fresh (Wet) Meadows.
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

**Peshtigo River HUC-04030105**

This watershed has lost approximately 12.02% of its overall historic wetlands, which is low for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 2.951 acres of wetland loss, which is the low for this service area. Permit trends show Shrub Swamps, Wooded Swamps, Floodplain Forests and Deep and Shallow Marshes under pressure from permitted actions. Wooded Swamps and Sedge Meadows have sustained the greatest estimated historic percentage losses when also considering estimated historic acreage losses to reinforce quantity losses across categories. The overall land use within this watershed is overwhelmingly natural at 78.88%, followed by agriculture at 16.33% and developed at 4.80%. The natural areas are comprised of mainly deciduous forest, woody wetlands, mixed forest and emergent herbaceous wetlands, while agriculture is composed of mainly cultivated crops with some pasture/hay area. Current mapped wetlands are dominated by Wooded Swamp and Floodplain Forests. Therefore, replacing Wooded Swamps, Sedge Meadows and Fresh (Wet) Meadows will fit well within this watershed given the overall forested / emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and forested vegetation

will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

- Restore and enhance Wooded Swamps, Sedge Meadows and Fresh (Wet) Meadows.
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Great Lakes Alkaline Rockshore, Boreal Rich Fen, Northern Sedge Meadow, Shore Fens, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

**Menominee River****HUC-04030108**

This watershed has lost approximately 10.66% of its overall historic wetlands, which is low for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 2.663 acres of wetland loss, which is the low for this service area. Permit trends identify Shrub Swamps as being under the greatest pressure from permitted actions. Wooded Swamps have sustained the greatest estimated historic percentage losses at 6.34% with significant estimated historic acreage losses. The overall land use within this watershed is overwhelmingly natural at 94.82%, with the remaining area split between agriculture at 4.74% and developed at a mere 0.44%, which is by far the lowest for this service area. The natural areas are comprised of mainly deciduous forest, woody wetlands and mixed forest, while agriculture is comprised of mainly cultivated crops. Current mapped wetlands are dominated by Wooded Swamps and Floodplain Forests, followed by Shrub Swamps. Therefore, replacing Wooded Swamps and Shrub Swamps will fit well within this watershed given the overall forested setting and compatible mapped wetland community dominant types. Forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Open Bog.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous) and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Open Bog.

**Brule River****HUC-04030106**

This watershed is found mainly in Florence, Forest and Vilas counties, where overlap data for WWI and PRW is not available and therefore historic wetland characterizations are not available at this time. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 0.492 acres of wetland loss, which is the low for this service area. Permit trends identify Wooded Swamps/Floodplain Forests as the wetland types under the greatest pressure from permitted actions. The overall land use within this watershed is overwhelmingly natural at 75.63%, with the remaining area split between developed at 21.75% and a small agriculture area of 2.62%. The natural areas are comprised of mainly deciduous forest, woody wetlands, mixed forest and evergreen forest, while agriculture is composed of mainly cultivated crops. Therefore, replacing Wooded Swamps and Floodplain Forests will fit well within this watershed given the overall forested setting and permitted losses. Forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also

shows this general watershed area as an opportunity area for the management of the following rare wetlands: Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Open Bog.

- Restore and enhance Wooded Swamps (Hardwood or Coniferous) and Floodplain Forests.
- Preserve and enhance Floodplain Forest, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond and Open Bog.

#### **Existing Advanced Watershed Plans (AWP):**

Miller, N., T. Bernthal, J. Wagner, M. Grimm, G. Casper, and J. Kline. (2012). *The Duck-Pensaukee Watershed Approach: Mapping Wetland Services, Meeting Watershed Needs*. The Nature Conservancy and Environmental Law Institute. Madison, Wisconsin.

#### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

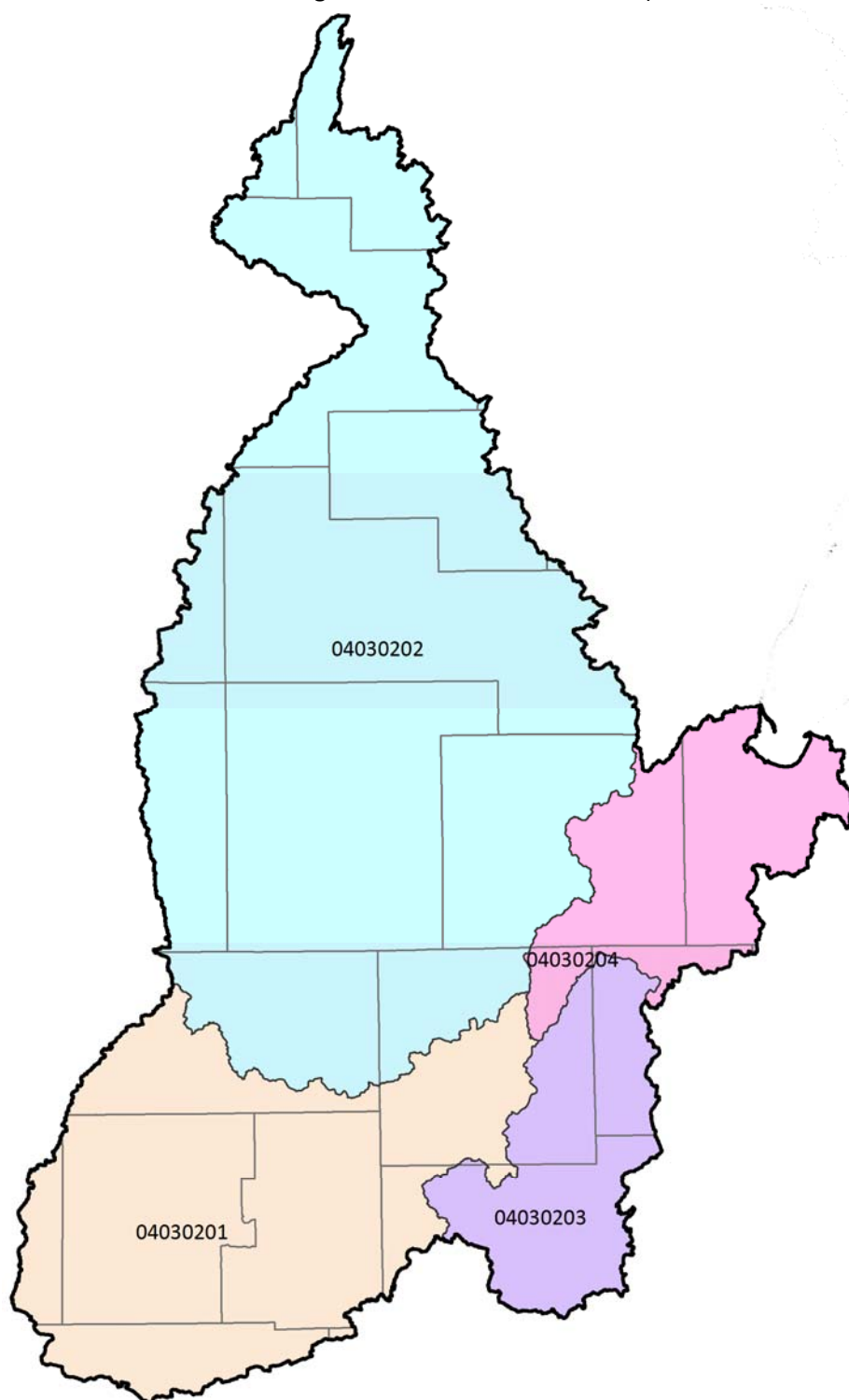
**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Fox CPF

### Element I. Service area:

**Overall SA Area with separate HUC-8 watersheds designated in color**  
(county & state boundaries shown in straight lines for further reference)

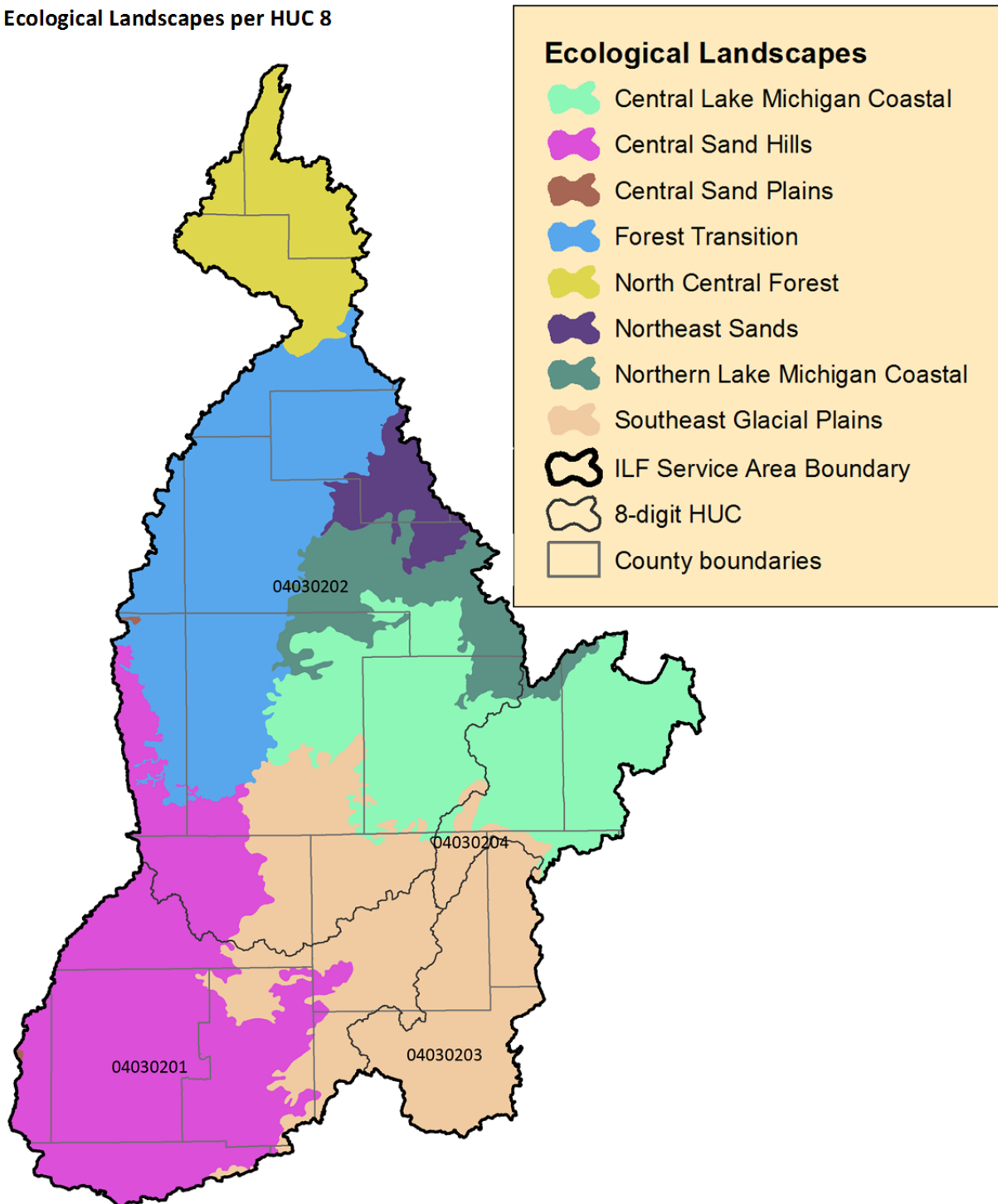


November 12, 2014

The Fox Service area is located in the eastern portion of Wisconsin comprised of Forest, Oneida, Langlade, Marathon, Shawano, Oconto, Brown, Portage, Waupaca, Outagamie, Waushara, Adams, Marquette, Green lake, Fond Du Lac and Columbia counties and drains an area approximately 6,359 square miles.

Ecological Landscapes include (WDNR 2012):

#### Ecological Landscapes per HUC 8



**Central Lake Michigan Coastal** – The climate in the eastern part of this Ecological Landscape is moderated by its proximity to Lake Michigan, leading to warmer temperatures in the fall and early winter and somewhat cooler temperatures during spring and early summer that influence vegetation and other aspects of the ecology. Lake effect snow can occur in areas along the Lake Michigan coast during the winter. Mean growing season is 160 days (second longest in the state), mean annual temperature is 45.1 deg. F, mean annual precipitation is 31.1 (second lowest in the state), and mean annual snowfall is 43.4 inches. There is adequate rainfall and growing degree days to support agricultural row crops, small grains, and pastures which are prevalent land uses here. Landforms are mostly glacial in origin, especially till plains and moraines, reworked and overlain in the western part by Glacial Lake Oshkosh. Beach ridges, terraces, and dunes formed near the shorelines of this glacial lake when sandy sediments were present. At other locations boulder fields were formed when silts and clays were removed by wave action. Along Lake Michigan coastal ridge and swale complexes, drowned river mouths (freshwater estuaries), and clay bluffs and ravines occur. The Niagara Escarpment is a prominent bedrock feature that runs along the east sides of lower Green Bay and the Fox River Valley. Most upland soils are reddish-brown calcareous loamy till or lacustrine deposits on moraines, till plains, and lake plains. The dominant soil is loamy or clayey with a silt loam surface, with moderately slow permeability, and high available water capacity. Lake Michigan is a key ecological and socioeconomic feature. It influences the climate, created unique landforms, and is responsible in part for the presence and distribution of rare species. The shoreline constitutes a major flyway for migratory birds. Most of the major cities in this Ecological Landscape are located at the mouths of rivers entering Lake Michigan or Green Bay. Inland lakes are scarce, and all are small. The Fox River drains Lake Winnebago and runs into Green Bay. The other major rivers here run directly into Lake Michigan, and include the Ahnapee, Kewaunee, East Twin, West Twin, Manitowoc, Sheboygan, and Milwaukee. Agriculture is the dominant land use here by area, and there are several medium sized cities. Some large forested wetlands occur in both the eastern and western parts of the Ecological Landscape. The Wolf River bottoms are especially important in the west. Extensive marshes persist in southwestern Green Bay. The ridge and swale complex at Point Beach contains the largest area of coastal forest (with associated wetlands, dunes, and beaches) and constitutes an extremely important repository of regional biodiversity. Population is estimated at 814,770, comprising 14.5% of the state total resulting in a population density of approximately 199 persons/ sq. mile. Public lands include Point Beach State Forest, Harrington Beach and Kohler-Andrae State Parks, several State Wildlife Areas (including several units of Green Bay West Shores, C. D. Besadny, Collins Marsh, Brillion Marsh, and Navarino), State Fishery Areas, and State Natural Areas.

**Central Sand Hills** – Typical of south central Wisconsin; mean growing season of 144 days, mean annual temperature is 44.8 deg. F, average January minimum temperature is 4deg. F, average August maximum temperature is 81deg. F, mean annual precipitation is 33 inches, mean annual snowfall is 44 inches. Although the climate is suitable for agricultural row crops, small grains, and pastures, the sandy soils somewhat limit agricultural potential. The landforms in this Ecological Landscape include a series of glacial moraines (the Johnstown Moraine is the terminal moraine of the Green Bay lobe; the Arnott Moraine is older, and has more subdued topography. Pitted outwash is extensive in some areas. Glacial tunnel channels occur here, e.g., in Waushara County, just east of and visible from I-39. Soils are

primarily sands. Organic soils underlie wetlands such as tamarack swamps and sedge meadows. Muck farming still occurs in some areas. Mosaic of extensive wetlands and small kettle lakes in the outwash areas, and the headwaters of coldwater streams originating in glacial moraines. Some seepage lakes and ponds exhibit dramatic natural water level fluctuations which create important Inland Beach and Coastal Plain Marsh habitats. The Wisconsin River and a short but ecologically important stretch of the lower Baraboo River flow through this Ecological Landscape. Other important rivers include the Fox, Grand, Mecedun, Montello, Puchyan, and White. Large impoundments occur on the Wisconsin (Lake Wisconsin), Fox (Buffalo and Puckaway lakes) and Grand (Grand River Marsh) rivers. Current vegetation is more than one-third agricultural crops, one third forest, and almost 20% grasslands with smaller amounts of open wetland, open water, shrubs, unvegetated (termed "barren" in WISCLAND), and urban areas. Large contiguous areas of any of the major natural or surrogate vegetation types are uncommon. Population is estimated at 182,035, comprising 3.2% of the state total resulting in a population density of approximately 59 persons/ sq. mile. Scattered Federal Waterfowl Production Areas, Fox River National Wildlife Refuge, scattered state-owned and managed lands, including Hartman Creek State Park, several State Wildlife Areas, Fisheries Areas, and Natural Areas.

**Central Sand Plains** – Typical of southern Wisconsin, mean annual temperature is 43.8 deg. F, mean annual precipitation is 32.8 inches, and mean annual snowfall is 45.0 inches. However, the mean growing season (135 days) is almost 19 days less than other southern Wisconsin ecological landscapes. Summer temperatures can drop below freezing at night in low-lying areas, restricting the distribution of some native plants. The short growing season and summer frosts limit agriculture, especially west of the Wisconsin River where commercially-grown cranberries are an important crop. East of the Wisconsin River the growing season is somewhat longer (by approximately 11 days), with fewer nights of potential summer frost. In this area agriculture is focused primarily on cool season crops such as potatoes, vegetables, and early maturing corn. Center pivot irrigation is widely used to water crops in this region of sandy soils. Grazing is a common land use practice in some areas. An extensive, nearly level expanse of lacustrine and outwash sand that originated from a huge glacial lake characterizes much of the Central Sand Plains. Sand was deposited in Glacial Lake Wisconsin by outwash derived from melting glaciers to the north. Exposures of eroded sandstone bedrock remnants as buttes, mounds and pinnacles are unique to this Ecological Landscape. Sandstone is also exposed as cliffs along the Black River and some of its tributaries. Most soils formed from deep sand deposits of glacial lacustrine or outwash origin or in materials eroded from sandstone hillslopes and sometimes with a surface of wind-deposited (aeolian) sand. These soils are excessively drained, with very rapid permeability, very low available water capacity, and low nutrient status. In lower-lying terrain where silty lacustrine material impedes drainage, the water table is very close to the surface. Such areas are extensive in the western part of the Ecological Landscape, where soils may be poorly drained with surfaces of peat, muck or mucky peat. Thickness of peat deposits ranges from a few inches to more than 15 feet. Large areas of wetlands and a number of generally low-gradient streams that range from small coldwater streams to large warmwater rivers. Major rivers include the Wisconsin, Black, East Fork of the Black, Yellow, and Lemonweir. A number of headwaters streams originate in the extensive peatlands west of the Wisconsin River. Natural lakes are rare, and are limited to riverine floodplains and a few scattered ponds within the bed of extinct Glacial Lake Wisconsin. The hydrology of this Ecological Landscape has been greatly

disrupted by past drainage, channelization, impoundment construction, and groundwater withdrawal. The eastern portion of the Central Sand Plains is a mosaic of cropland, managed grasslands and scattered woodlots of pine, oak, and aspen. Many of the historic wetlands in the east were drained early in the 1900s and are now used for agricultural purposes. The western portion of this Ecological Landscape is mostly forest or wetland. Oak, pine, and aspen are the most abundant forest cover types. Plantations of red pine are common in some areas. On wet sites the forests are of two major types: tamarack and black spruce in the peatlands, and bottomland hardwoods in the floodplains of the larger rivers. Many attempts to practice agriculture west of the Wisconsin River failed due to poor soils, poor drainage, and growing season frosts. Population is estimated at 292,119, comprising 5.1% of the state total resulting in a population density of approximately 46 persons/ sq. mile. Approximately one-quarter of the Ecological Landscape is publicly owned, very high for an Ecological Landscape this far south.

**Forest Transition** – Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the "Tension Zone") that runs southeast-northwest across the state. The mean growing season is 133 days, mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The growing season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. The Forest Transition was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Most soils are non-calcareous, moderately well-drained sandy loams derived from glacial till, but there is considerable diversity in the range of soil attributes. The area includes sandy soils formed in outwash, as well as organic soils, and loam and silt loam soils on moraines. There are many areas with shallow soils. Drainage classes range from poorly drained to excessively drained. Density of the till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition. Soils throughout the Ecological Landscape have silt loam surface deposits formed in aeolian loess, about 6 to 24 inches thick in much of the area. Major river systems draining this Ecological Landscape include the Wolf, Wisconsin, Black, Chippewa, and St. Croix. Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the Ecological Landscape remains heavily forested, the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared), and the west end is a mixture of forest, lakes, and agricultural land. Population is estimated at 639,625, comprising 11.4% of the state total resulting in a population density of approximately 49 persons/ sq. mile. About 88% of all forested land is privately-owned while 12% belongs to the state, counties or municipalities.

**North Central Forest** – Typical of northern Wisconsin, mean growing season in the North Central Forest is 115 days, the shortest growing season of all Ecological Landscapes in the state. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean

annual snowfall is 63 inches. However, heavier snowfall can occur closer to Lake Superior, especially in the northwestern part of the Ecological Landscape in the topographically higher Penokee-Gogebic Iron Range. The cool temperatures and short growing season are not conducive to supporting agricultural row crops such as corn in most parts of the Ecological Landscape. Only six percent of the North Central Forest is in agricultural use. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penokee-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands. Rivers, streams, and springs are common and found throughout this Ecological Landscape. Major rivers include the Wisconsin, Chippewa, Flambeau, Jump, Wolf, Pine, Popple, and Peshtigo. Large lakes include Namekagon, Courte Oreilles, Owen, Round, Butternut, North Twin, Metonga, Pelican, Pine, Kentucky, Pickerel, and Lucerne. Several large man-made flowages occur here such as the Chippewa, Turtle-Flambeau, Gile, Pine, and Mondeaux. There are several localized but significant concentrations of glacial kettle lakes associated with end and recessional moraines (e.g., the Perkinstown, Bloomer, Winegar, Birchwood Lakes, and Valhalla/Marenisco Moraines.) In southern Ashland and Bayfield counties, the concentrations of lakes are associated with till plains or outwash over till. Lakes here are due to dense till holding up the water table. Rare lake types in the North Central Forest include marl and meromictic lakes. Forests cover approximately 75% of this Ecological Landscape. The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack), non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marsh (including wild rice marshes) are widespread in the North Central Forest. Population is estimated at 244,782, comprising 4.4% of the state total resulting in a population density of approximately 19 persons/ sq. mile. Forty-two percent is publicly owned, mostly by federal, state or county governments.

**Northeast Sands** – The short growing season (122 days) is similar to other northern Ecological Landscapes and limits yield potential for row crop agriculture. January minimum temperatures average higher than other northern Ecological Landscapes. The average August maximum temperature (78.8o) is the third coolest of any other Ecological Landscape in the state. The Green Bay Lobe covered this Ecological Landscape during the last part of the Wisconsin Glaciation. As the Green Bay Lobe melted and retreated eastward, outwash was deposited over lower-lying surface features, so the Ecological Landscape now appears as a nearly level to rolling sandy outwash plain, pitted in places, with sandy heads-of-outwash and loamy moraines protruding through the outwash sediment. Heads-of-outwash, uncommon in most of Wisconsin, are a distinctive glacial feature here. A series of north-south trending morainal and head-of-outwash hills runs the length of the west side of this Ecological Landscape. They

are oriented in roughly parallel positions, marking the outer extent of Green Bay Lobe deposits in northeastern Wisconsin. Most upland soils formed in acid outwash sand on outwash plains or outwash heads. The dominant soil is excessively drained and sandy with a loamy sand surface, rapid permeability, and very low available water capacity. More than half the land surface is made up of outwash sand and gravel. Glacial till deposits here have pH values that are neutral to calcareous, unlike the acid tills of most of northern Wisconsin, because dolomite was incorporated into the till as glaciers passed over the Niagara Escarpment. Rivers and streams include the Menominee, Peshtigo, Pike, Pine, Oconto, South Branch of the Oconto, and Wolf rivers. Scattered lakes are present, with local concentrations of small lakes in the far north, far south, and the northeast. Several large impoundments have been constructed, such as those on the Menominee and Peshtigo rivers. Hwy 64 bisects the Brazeau Swamp, one of Wisconsin's largest cedar swamps, disrupting its hydrology and altering composition and function. A large portion of this swamp was cleared and drained and is now a "muck farm" used to grow vegetables. Forests cover about 75% of this Ecological Landscape. Aspen is the most abundant cover type, and dry forests dominated by scrub-oak and jack pine are common. Plantation-grown pine, hemlock-hardwoods and northern hardwoods are also among the important upland cover types. Common lowland communities include wet-mesic forests dominated by northern white cedar, black spruce-tamarack swamps, and alder-dominated shrub swamps. Agriculture (only 7% of the area) is concentrated mostly in the southeastern and northernmost portions of the Ecological Landscape. Population is estimated at 89,421, comprising 1.6% of the state total resulting in a population density of approximately 27 persons/sq. mile. Notable properties include the Chequamegon-Nicolet National Forest, Peshtigo River State Forest, Governor Tommy Thompson State Park, Peshtigo Brook State Wildlife Area, the Pine-Popple Wild Rivers, the Menominee River Natural Resources Area, and scattered State Natural Areas, including Dunbar Barrens and Spread Eagle Barrens.

**Northern Lake Michigan Coastal** – Cold winters and warm summers are moderated by the thermal mass of Lake Michigan, especially in coastal areas. The mean growing season is 140 days, mean annual temperature is 42.8 deg. F, mean annual precipitation is 32.1, and mean annual snowfall is 46 inches. Lake effect snow can be significant, especially along Lake Michigan. Rainfall and growing degree days are adequate to support agricultural row crops, small grains, hay and pastures. Warmer temperatures near Lake Michigan in fall and early winter and slightly cooler temperatures during spring and early summer are favorable for growing cherries, apples, and other fruits on the Door Peninsula. The Niagara Escarpment is a prominent bedrock ridge of Silurian dolomite that is exposed as cliffs and ledges along the western edge of the Door Peninsula and in the Grand Traverse Islands. The same bedrock is also exposed at many locations along the east side of the northern Door Peninsula, where it forms broad, nearly level bedrock shorelines. A broad, level lacustrine plain occurs in areas bordering the west shore of Green Bay, where an extensive delta has been created at the mouth of the Peshtigo River. Landforms along the Lake Michigan shore include beaches, dunes, baymouth bars, and complex ridge and swale topography. Embayment lakes and freshwater estuaries are also characteristic of the Lake Michigan shore. Elsewhere in this Ecological Landscape, ground moraine is the dominant landform. Soils are diverse; in some areas, lacustrine sands are found overlying clays, or bedrock which is within a few feet of the surface. On the Door Peninsula soils are calcareous, typically stony loamy sands to loams. Shallow soils and exposures of dolomite bedrock are frequent near the Lake Michigan and Green Bay coasts.

Poorly drained sands are common in the lake plain west of Green Bay and in depressions between dunes and beach ridges. Beyond the lake plain west of Green Bay, the ground moraine is composed mostly of moderately well-drained, rocky sandy loams, interspersed with lacustrine sands and clays. Peats and mucks are common along the west shore of Green Bay and in the northwestern part of the Ecological Landscape. There is an area of sandy soils between Stiles and Oconto Falls west of Green Bay. Chambers Island has "sandy, gravelly, clayey soils". Lake Michigan is cold, deep, oligotrophic, and relatively clean; Green Bay, an estuary that is also the largest bay on Lake Michigan, is warm, shallow, productive, and dynamic. It has been heavily polluted, especially by industries that formerly dumped wastes into the Fox River at the head of the bay (which is within the Central Lake Michigan Coastal Ecological Landscape). The larger rivers that flow through this Ecological Landscape into Green Bay include the Menominee, Oconto, Peshtigo, and Pensaukee. These rivers and their tributaries drain the uplands west of Green Bay before passing through the extensive wetlands along Green Bay's west shore. Several large embayment lakes (e.g., Clark, Europe, and Kangaroo lakes) occur along the east side of the northern Door Peninsula. There are few large inland lakes. Several impoundments constructed on rivers west of Green Bay had been subjected to high levels of pollution from past industrial activity. On the Door Peninsula there have been serious groundwater contamination problems from agricultural pesticides and manure. These pollutants were able to reach the groundwater through the fractured dolomite bedrock. The lower Wolf River drains the westernmost part of this Ecological Landscape. Historically, the uplands were almost entirely covered by forest. Today, more than 64% is non-forested. Most of this land is now in agricultural crops (51%), with smaller amounts of grassland (5.6%), non-forested wetlands (6.1%), shrubland 0.1%), and urbanized areas (0.8%). The most abundant cover type in the forested uplands (262,119 acres or 20.4% of the Ecological Landscape) is maple-basswood, with smaller amounts of aspen-birch. Forested wetlands (mostly lowland hardwoods, with some conifer swamps) cover slightly over 14% of the area. Other cover types are comparatively scarce but of high importance ecologically, and include maple-beech, hemlock-hardwoods, white pine, and mixtures of boreal conifers (dominants include white spruce-balsam fir-white pine-white cedar). Important non-forested wetland communities include marsh, sedge meadow, and shrub swamp. Population is estimated at 148,920, comprising 2.7% of the state total resulting in a population density of approximately 39 persons/ sq. mile. Only about 3.5% of the Ecological Landscape is public land.

**Southeast Glacial Plains** – Typical of southern Wisconsin; mean growing season of 155 days, mean annual temperature is 45.9 deg. F, mean annual precipitation is 33.6 inches, and mean annual snowfall is 39.4 inches. The climate is suitable for agricultural row crops, small grains, and pastures, which are prevalent in this Ecological Landscape. The dominant landforms are glacial till plains and moraines composed mostly of materials deposited during the Wisconsin Ice Age, but the southwestern part of the Ecological Landscape consists of older, pre-Wisconsin till and the topography is more dissected. Other glacial landforms, including drumlins, outwash plains, eskers, kames and kettles are also well-represented kames, eskers, and kettles. The "Kettle Moraine" is an area of rough topography on the eastern side of the Southeast Glacial Plains that marks the areas of contact between the Green Bay and Lake Michigan glacial lobes. Numerous excellent examples of glacial features occur and are highly visible in the Kettle Moraine. Soils are derived from lime-rich tills overlain in most areas by a silt-loam loess cap. The Southeast Glacial Plains has the highest aquatic productivity for plants, insects, other invertebrates,

and fish of any Ecological Landscape in the state. Significant river systems include the Wolf, Bark, Rock, Fox, Milwaukee, Sugar, Mukwonago, and Sheboygan. Most riparian zones have been degraded. Several clusters of large lakes exist, including the Yahara chain of lakes in and around Madison, and the Lake Winnebago Pool system. Kettle lakes occur within end moraines, in outwash channels, and in ancient riverbeds. This Ecological Landscape contains some huge marshes, as well as fens, sedge meadows, wet prairies, tamarack swamps, and floodplain forests. Many wetlands here have been affected by hydrologic modifications (ditching, diking, tiling), grazing, infestations of invasive plants, and excessive inputs of sediment- and nutrient-laden runoff from croplands. Primarily agricultural cropland (58% of Landscape). Remaining forests occupy only 11% of the land area and major cover types include maple-basswood, oak, lowland hardwoods, and conifer swamps (mostly tamarack-dominated). No large areas of upland forest exist except on the Kettle Interlobate Moraine, where the topography is too rugged to practice intensive agriculture and the soils are not always conducive to high crop productivity. Wetlands are extensive (12% of Landscape, 593,248 acres) and include large marshes and sedge meadows, and extensive forested lowlands within the Lower Wolf River floodplain. Forested lowlands are also significant along stretches of the Milwaukee, Sugar, and Rock rivers. Population is estimated at 1,519,000, comprising 28.5% of the state total resulting in a population density of approximately 204 persons/ sq. mile. Only four percent of the Southeast Glacial Plains is in public ownership (226,230 acres), of which 58% is wetland and 42% is upland.

This Service area can be further broken down into four smaller HUC-8 watersheds, the Wolf River (04030202), Upper Fox River (04030201), Lower Fox River (04030204) and Lake Winnebago (04030203). These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

## **Element II. Threats:**

Overall wetland resource threats within this service area include a very high rate of agricultural activity and development in the eastern extents, groundwater depletion in the western and southwestern portions, water quality in the southeastern extents resulting in 303d listed impaired waters, invasive species in the southeastern areas, fragmentation of corridors and land use changes areas. The northern tip of this service area (North Central Forests **WDNR 2012**) is wrangling with the roles played by and ecological relationships among public, private, industrial, and tribal lands from a conservation, socioeconomic, and recreational perspectives. In recent years there has been documentation of widespread negative impacts to forests from: excessive deer browse; invasive earthworms, insects, plants and pathogens; divestitures of large private holdings (especially estates and industrial forests); increased parcelization; and the development of shoreline habitats. Other important factors to consider include: the potential implications of climate change; ecological impacts of increased biomass harvest; forest type conversions; forest simplification and homogenization of resources. The central portions (Forest Transition, Northeast Sands, North Lake Michigan Coastal, Central Lake Michigan Coastal **WDNR 2012**) have lost a vast majority of its forested landscape in the eastern extents to development and agricultural land uses, while some forest tracts remain in the west and northern extent with fragmentation running rampant. Invasive species mirror the disturbance pattern of land use with high

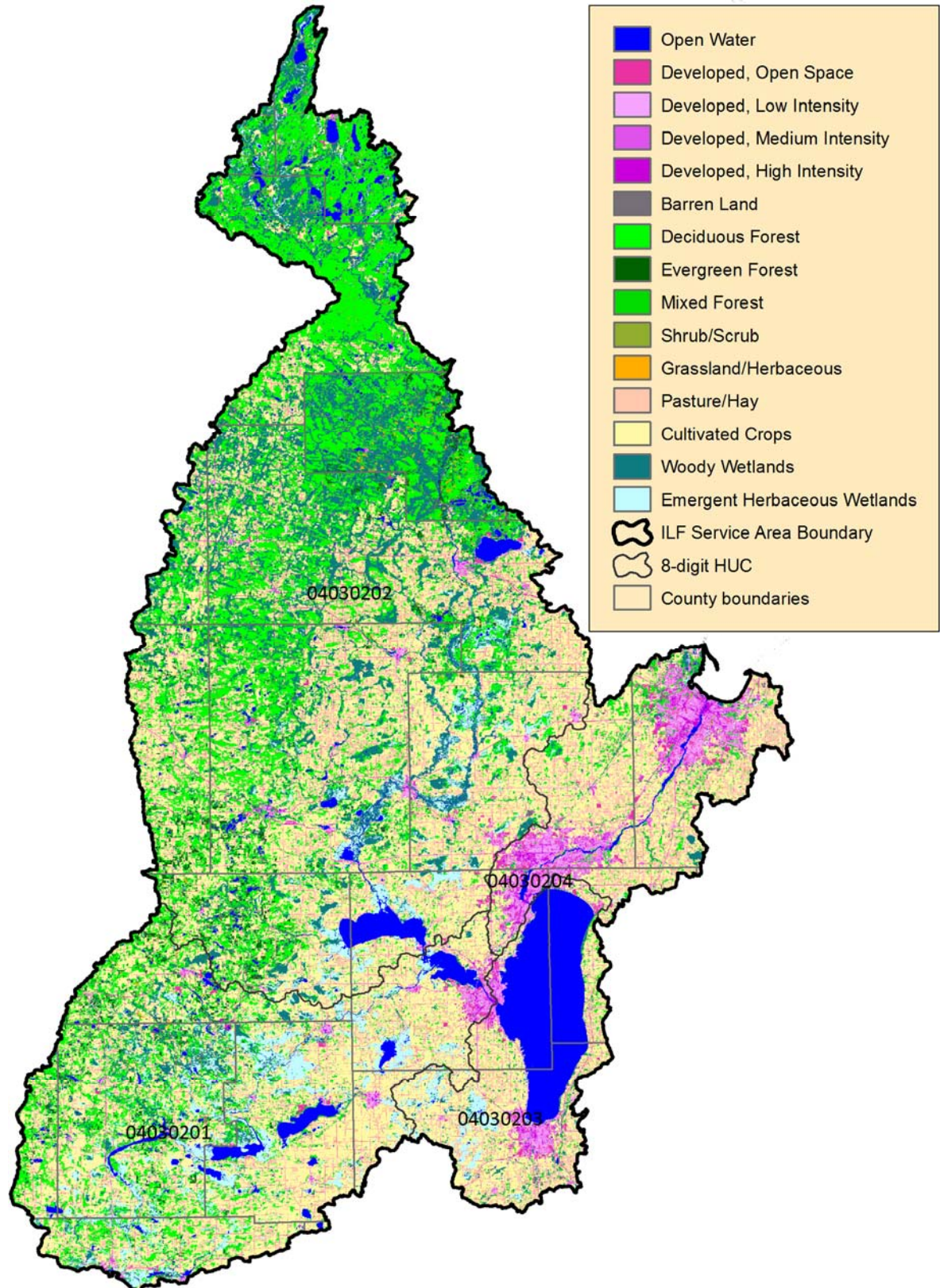
establishment present in the eastern portions. Impaired 303d listed waterways follow this pattern with higher occurrences within the eastern and southern portions. The southern portions of this service area (Central Sand Hills, Southeast Glacial Plains **WDNR 2012**) are under threat from groundwater withdrawals and other hydrologic disruptions from ditching and diking. Overall fragmentation of habitat and shoreline development combined with the spread of invasives threatens resource quality. Increasing impervious surfaces threaten resource quality from increased runoff, thermal impacts and nutrient loading. Impaired 303d listed waterways are present in the southern and southeastern extents.

The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

**Current Land Use:**

**Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**  
(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
04030204 - Lower Fox River	360,721	70,485	229,220	61,017	19.54%	63.54%	16.92%
04030201 - Upper Fox River	1,093,198	127,471	528,750	436,977	11.66%	48.37%	39.97%
04030203 - Lake Winnebago	366,131	38,730	151,853	175,548	10.58%	41.48%	47.95%
04030202 - Wolf River	2,379,689	124,040	858,092	1,397,557	5.21%	36.06%	58.73%

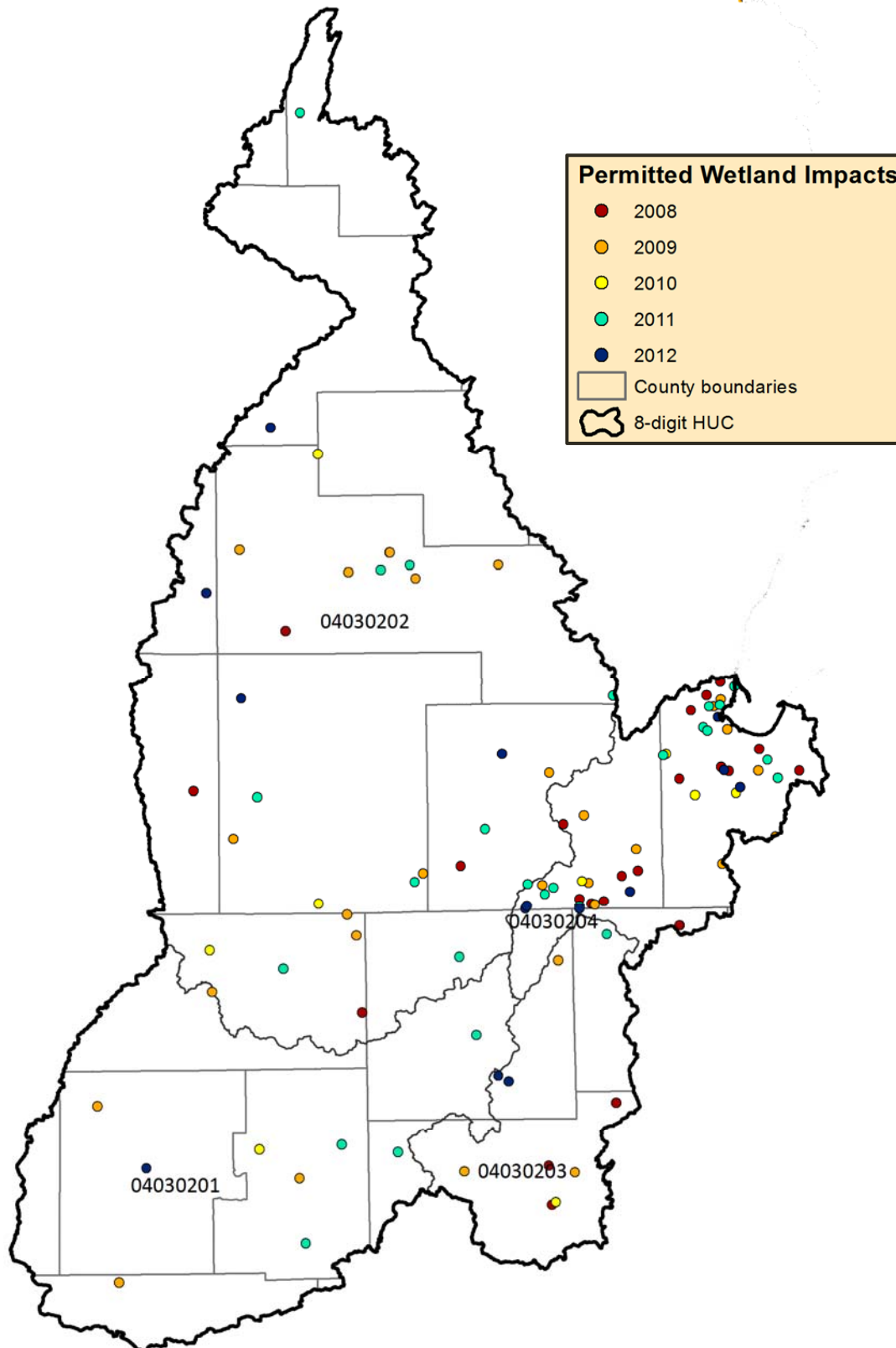
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that the from the perspective of land use changes the Lower Fox River HUC-04030204 is under the greatest threat from both development (19.54% land use) and agriculture (63.54% land use) with only 16.92% of its area containing natural land uses. The table also depicts significant land use affecting the majority of all HUC-8 watershed areas with agriculture leading the way following by development.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



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**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
04030202 - Wolf River	13%	0%	66%	14%	8%	0%	31.665
04030204 - Lower Fox River	25%	1%	42%	19%	8%	4%	21.185
04030203 - Lake Winnebago	0%	0%	86%	0%	12%	2%	4.927
04030201 - Upper Fox River	35%	0%	65%	0%	0%	0%	3.802

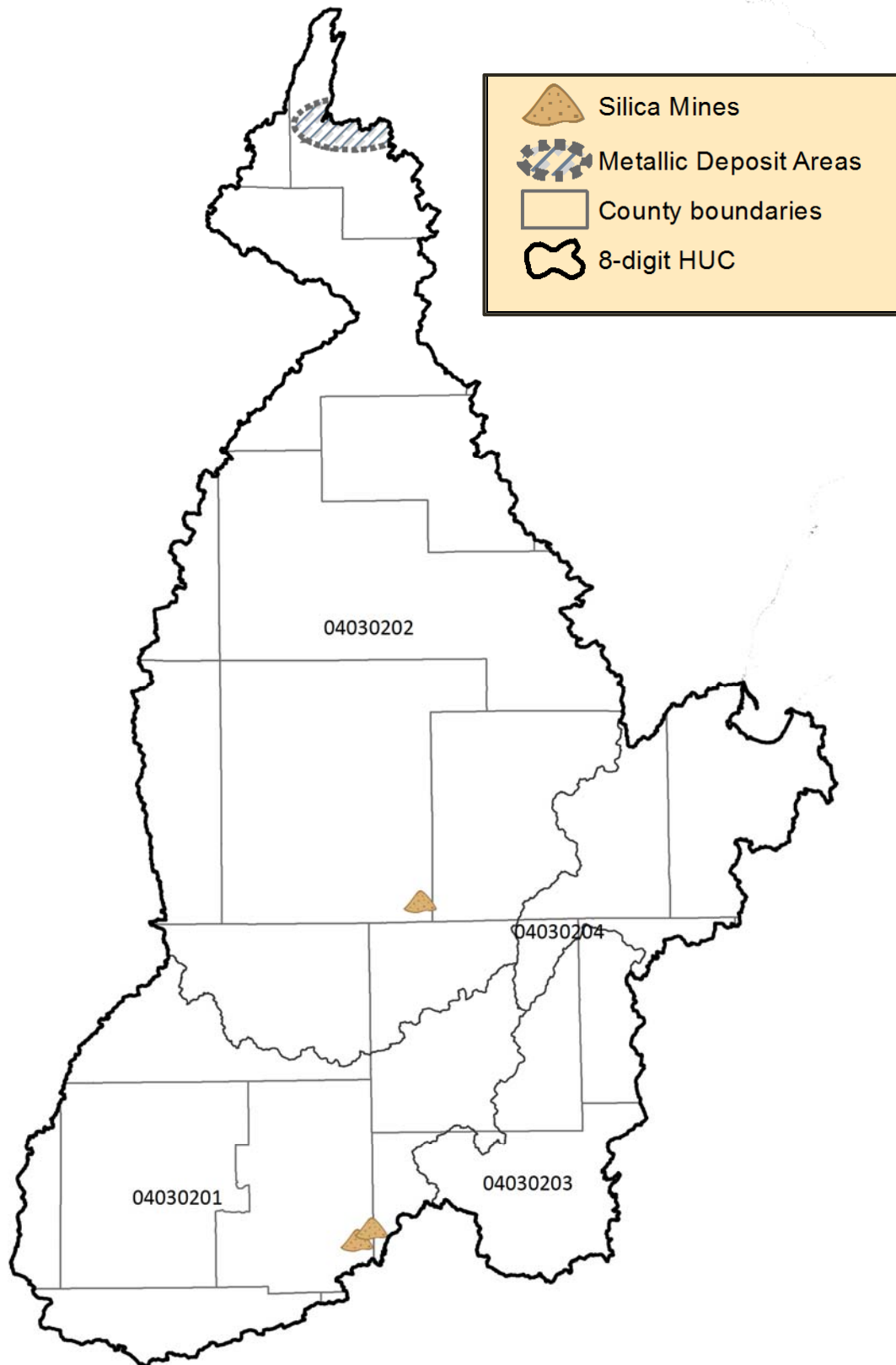
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

The Fox SA contains portions of the current metallic Crandon Deposit, which generally refers to a 55 million ton ore containing zinc, copper, lead, gold and silver. If developed this mine would be an underground mine with approximately 55 acres of surface impact. This metallic deposit is located within the Wolf River HUC-04030202 presenting an increased threat to this area. This SA also contains some non-metallic silica mines as seen on the map below. These non-metallic mines are located within the Wolf River HUC-04030202 and the Upper Fox River HUC-04030201 presenting an increased threat to these watersheds areas. Collectively these increased threats warrant a higher priority for the identified HUC-8 watersheds.

**Potential Mining Impacts per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

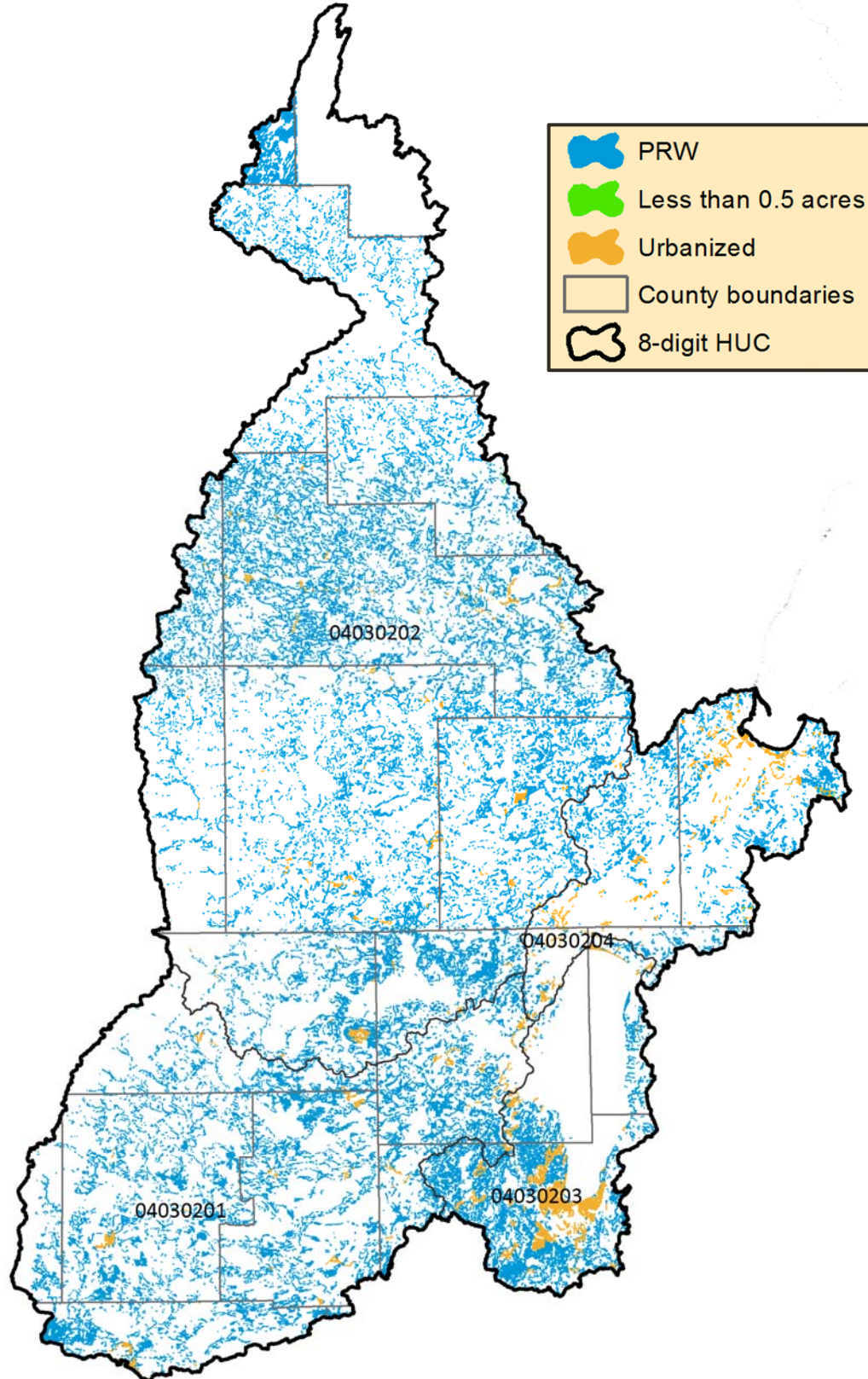


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**Element III. Historic Loss:**

This watershed follows suit with much of the state in that agriculture practices following the peak of the timber industry have historically lead to the majority of wetland losses. Wetland areas have had their hydrology altered through ditching and tiling and their vegetation cleared to make way for farming. The clearing of forested areas gave way to agriculture, which in turn brought more people to the area. Dams built in support of mills to process harvest grains have also play a role in adversely altering riparian wetlands, but the largest historical impact in this particular watershed remains the timber industry and subsequent agricultural culture (***WDNR Basin Website 2013***). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Overall Estimated Historic Wetland Percent Loss Summary**

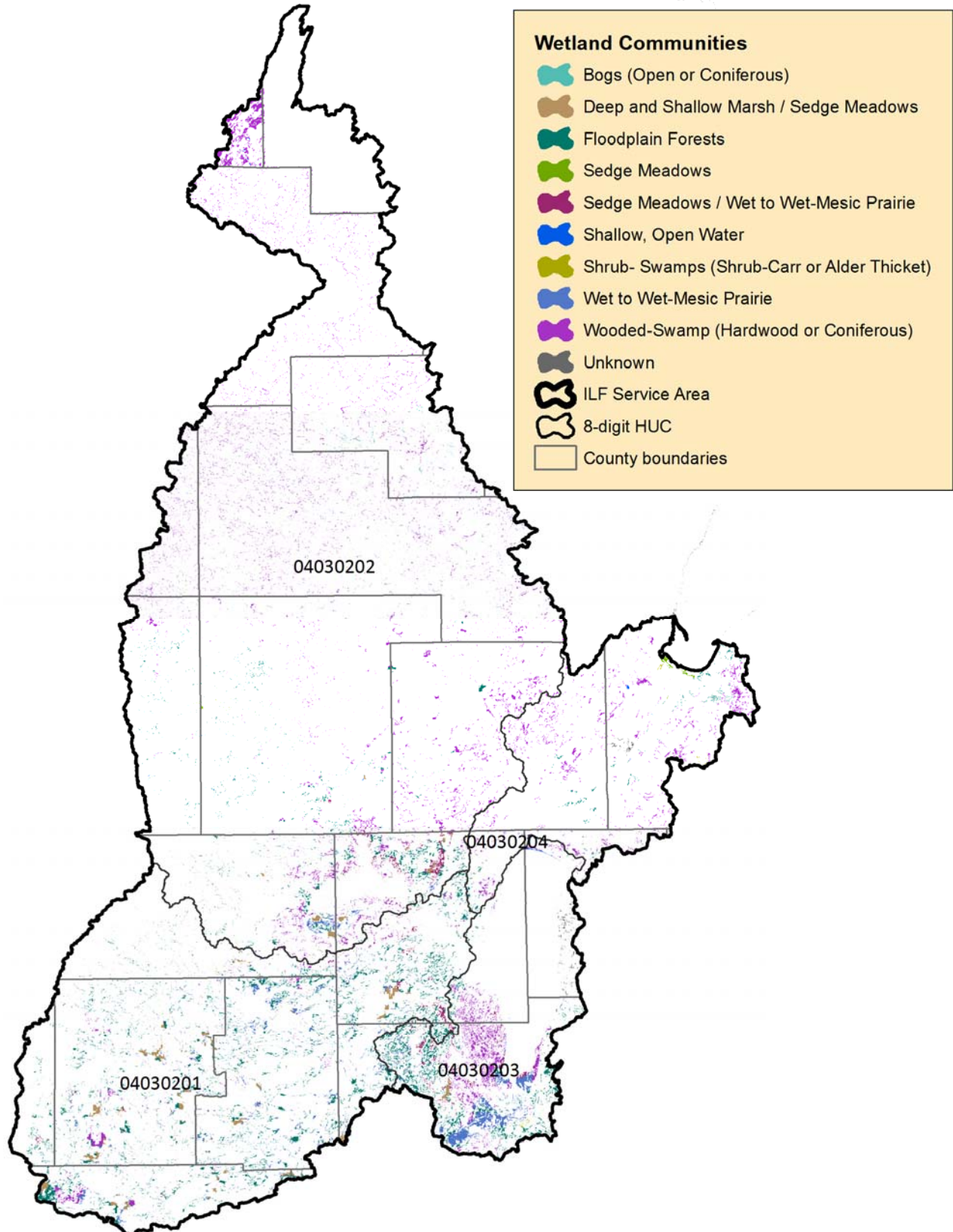
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
04030203 - Lake Winnebago	30,102	63.66%
04030204 - Lower Fox River	14,972	39.18%
04030201 - Upper Fox River	63,997	23.47%
04030202 - Wolf River	105,645	18.53%

The information above identifies the Lake Winnebago HUC-04030203 as having sustained the greatest historic loss of wetlands. It should be noted that Forest County not currently have digitally available WWI or PRW data, but this represents only a small portion of the Wolf River HUC-04030202 and is not anticipated to significantly impact the above results.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
04030203 - Lake Winnebago	36.65%	13.02%	66.86%	36.67%	56.94%	59.15%	26.29%	73.42%	84.49%	74.60%
04030204 - Lower Fox River	0.61%	#DIV/0!	48.26%	70.69%	#DIV/0!	49.29%	58.19%	67.61%	41.02%	40.22%
04030201 - Upper Fox River	#DIV/0!	14.68%	33.06%	11.28%	31.91%	12.14%	0.25%	#DIV/0!	27.21%	23.55%
04030202 - Wolf River	8.09%	9.58%	18.12%	21.03%	58.17%	18.33%	2.05%	#DIV/0!	59.59%	14.16%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

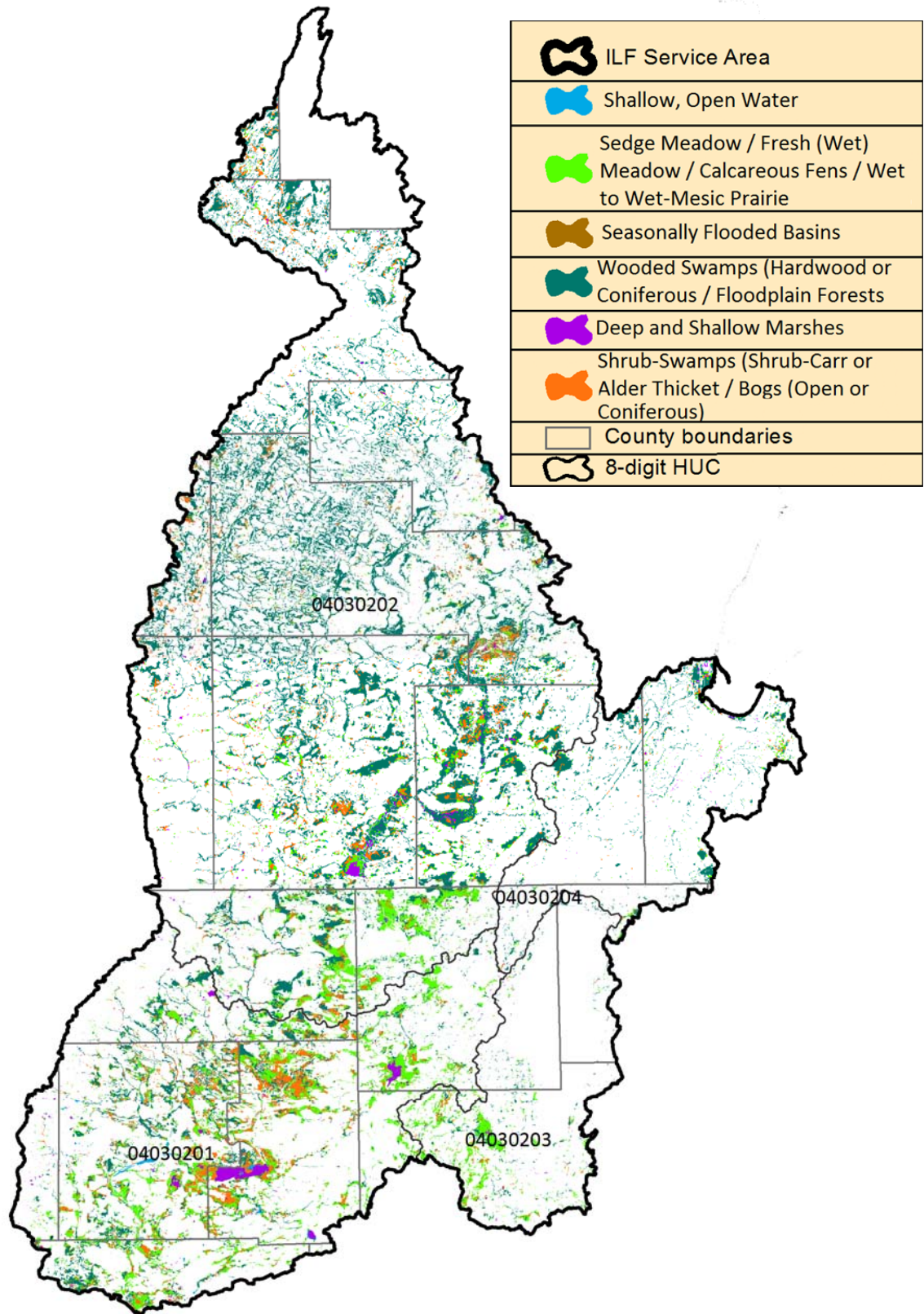
**Element IV. Current Conditions:**

The Fox SA is very diverse with a varied and dynamic land use affected by rapid growth of its communities. Agriculture, urban, recreation, tourism and forests compose the major land use activities. A complex geomorphology consisting of two main distinct ecoregions, the Central Sand Ridges and the Southeast Glacial Plains have intricately shaped the character of the natural resources (**WDNR Basin Website 2013**). The northern and western portions of this SA contain more natural land use character, while the southern and eastern portions are dominated by agriculture with very intense pockets of urbanized development surrounding major cities.

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04030202 - Wolf River	532.98	69,232.41	11.27	352,101.87	8,990.02	64,823.18	496,928.26
04030201 - Upper Fox River	2,986.55	85,801.65	0.00	68,610.51	11,973.63	53,095.21	226,001.75
04030204 - Lower Fox River	18.37	4,769.28	0.00	23,416.61	921.49	2,334.67	31,615.69
04030203 - Lake Winnebago	0.00	14,816.85	0.00	6,205.70	662.27	2,309.65	24,230.53

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04030202 - Wolf River	0.11%	13.93%	0.00%	70.86%	1.81%	13.04%	100.00%
04030201 - Upper Fox River	1.32%	37.97%	0.00%	30.36%	5.30%	23.49%	100.00%
04030204 - Lower Fox River	0.06%	15.09%	0.00%	74.07%	2.91%	7.38%	100.00%
04030203 - Lake Winnebago	0.00%	61.15%	0.00%	25.61%	2.73%	9.53%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.

7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.
8. Restore, enhance, establish and/or preserve 10 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

**Lake Winnebago****HUC-04030203**

This watershed has lost approximately 63.66% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 4.927 acres of wetland loss, which is low for this service area. Permit trends identify Deep and Shallow Marshes, Wooded Swamps, Floodplain Forests and Shrub Swamps as the wetland types under the greatest pressure from permitted actions. Wet to Wet-Mesic Prairie and Wooded Swamps have sustained the greatest estimated historic percentage losses at 84.49% and 74.60% respectively, followed by Shrub Swamps at Floodplain Forests at 66.86%. A review of the estimated historic acreage losses reinforce quantity losses across these categories and also identify Sedge Meadows as having sustained significant estimated losses. The overall land use within this watershed is split between natural at 47.95% and agriculture at 41.48%, with developed at 10.58%. The natural areas are comprised of mainly open water, emergent/herbaceous wetlands and woody wetlands, while the agriculture areas are mainly cultivated crops with some pasture/hay area. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

**Lower Fox River****HUC-04030204**

This watershed has lost approximately 39.18% of its overall historic wetlands, which is the second highest for this service area. Corps permitted actions over the past 5 years depicts 21.185 acres of wetland loss, which is the second highest for this service area. Permit trends identify Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Calcareous Fens as the wetland types under the greatest pressure from permitted actions. Sedge Meadows and Shrub Swamps

have sustained the greatest estimated historic percentage losses at 70.69% and 58.19% respectively, followed by Floodplain Forests at 48.26%. Estimated historic acreage losses reinforce quantity losses across these categories. The overall land use within this watershed is mainly agriculture at 63.54%, with developed at 19.54% and natural at 16.92%. The agriculture areas are comprised of mainly cultivated crops with some pasture/hay area, while the natural land use is comprised of mainly deciduous forest, woody wetlands, open water and emergent herbaceous areas. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall forested / emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve Southern Sedge Meadow, Floodplain Forest, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Great Lakes Ridge and Swale, Interdunal and Open Bog.

#### **Wolf River                      HUC-04030202**

This watershed has lost approximately 18.53% of its overall historic wetlands, which is the lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 31.665 acres of wetland loss, which is the highest for this service area. Permit trends identify Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Calcareous Fens as the wetland types under the greatest pressure from permitted actions. Sedge Meadows, Wet to Wet-Mesic Prairie and Floodplain Forests have sustained the greatest estimated historic percentage losses, which is reinforced by their estimated historic acreage loss quantities. The overall land use within this watershed is mainly natural at 58.73%, with agriculture at 36.06% and developed at 5.21%. The natural areas are comprised of mainly deciduous forests, woody wetlands, emergent herbaceous wetlands and open water, while agriculture is overwhelmingly composed of cultivated crops representing the highest quantity program wide. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, followed by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies and Shrub Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall forested / emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Open Bog.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Floodplain Forests.

- Preserve Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Boreal Rich Fen, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Open Bog.

#### **Upper Fox River HUC-04030201**

This watershed has lost approximately 23.47% of its overall historic wetlands, which is the second lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 3.802 acres of wetland loss, which is the lowest for this service area. Permit trends identify Deep and Shallow Marshes as those under the greatest pressure from permitted actions, but it should be noted that the other 35% of impacts are not specified. Sedge Meadows, Wet to Wet-Mesic Prairie and Floodplain Forests have sustained the greatest estimated historic percentage losses, which is reinforced by their estimated historic acreage loss quantities. The overall land use within this watershed is mainly agriculture at 48.37%, with natural at 39.97% and developed at 11.66%. The agriculture areas are comprised of overwhelmingly cultivated crops, while the natural areas are mainly deciduous forests, emergent herbaceous wetlands and woody wetlands. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, Wooded Swamps and Floodplain Forests. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall forested / emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and forested vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Open Bog.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Floodplain Forests.
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamp, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen and Open Bog.

#### **Existing Advanced Watershed Plans (AWP):**

Stark, Kevin J., and Jensen D. Connor. 2013. *A landscape-scale wetland functional assessment and identification of potential wetland restoration sites for the Stockbridge-Munsee Community*. GeoSpatial Services, Saint Mary's University of Minnesota. Winona, MN.

Miller, N., T. Bernthal, J. Wagner, M. Grimm, G. Casper, and J. Kline. (2012). *The Duck-Pensaukee Watershed Approach: Mapping Wetland Services, Meeting Watershed Needs*. The Nature Conservancy and Environmental Law Institute. Madison, Wisconsin.

#### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First,** select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second,** select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

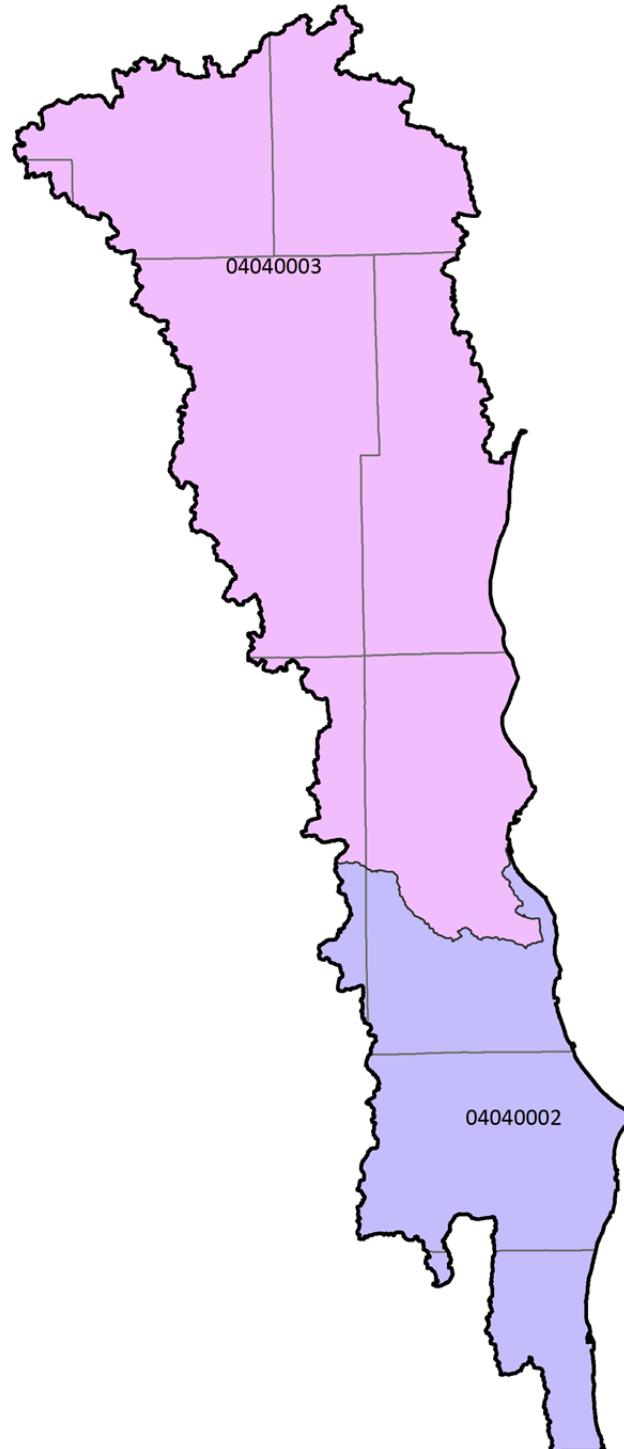
**Third,** select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

**Fourth,** prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Southwestern Lake Michigan CPF

### Element I. Service area:

**Overall SA Area with separate HUC-8 watersheds designated in color**  
(county & state boundaries shown in straight lines for further reference)

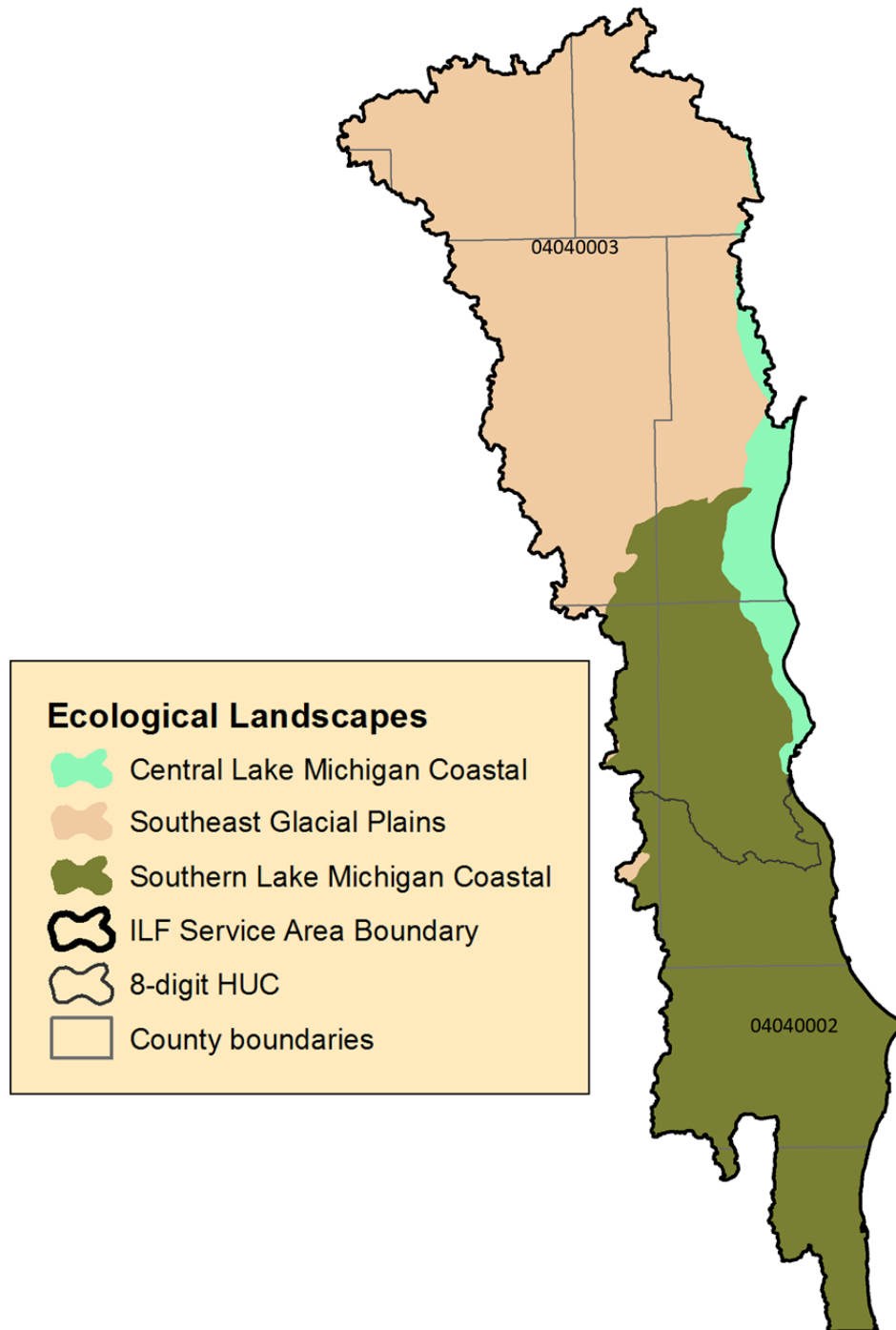


November 12, 2014

The Southwestern Lake Michigan Service area is located at the south eastern tip of Wisconsin comprised of Fond Du Lac, Sheboygan, Washington, Ozaukee, Waukesha, Milwaukee, Racine and Kenosha counties and drains an area approximately 1,182 square miles.

Ecological Landscapes include (WDNR 2012):

**Ecological Landscapes per HUC 8**



**Central Lake Michigan Coastal** – The climate in the eastern part of this Ecological Landscape is moderated by its proximity to Lake Michigan, leading to warmer temperatures in the fall and early winter and somewhat cooler temperatures during spring and early summer that influence vegetation and other aspects of the ecology. Lake effect snow can occur in areas along the Lake Michigan coast during the winter. Mean growing season is 160 days (second longest in the state), mean annual temperature is 45.1 deg. F, mean annual precipitation is 31.1 (second lowest in the state), and mean annual snowfall is 43.4 inches. There is adequate rainfall and growing degree days to support agricultural row crops, small grains, and pastures which are prevalent land uses here. Landforms are mostly glacial in origin, especially till plains and moraines, reworked and overlain in the western part by Glacial Lake Oshkosh. Beach ridges, terraces, and dunes formed near the shorelines of this glacial lake when sandy sediments were present. At other locations boulder fields were formed when silts and clays were removed by wave action. Along Lake Michigan coastal ridge and swale complexes, drowned river mouths (freshwater estuaries), and clay bluffs and ravines occur. The Niagara Escarpment is a prominent bedrock feature that runs along the east sides of lower Green Bay and the Fox River Valley. Most upland soils are reddish-brown calcareous loamy till or lacustrine deposits on moraines, till plains, and lake plains. The dominant soil is loamy or clayey with a silt loam surface, with moderately slow permeability, and high available water capacity. Lake Michigan is a key ecological and socioeconomic feature. It influences the climate, created unique landforms, and is responsible in part for the presence and distribution of rare species. The shoreline constitutes a major flyway for migratory birds. Most of the major cities in this Ecological Landscape are located at the mouths of rivers entering Lake Michigan or Green Bay. Inland lakes are scarce, and all are small. The Fox River drains Lake Winnebago and runs into Green Bay. The other major rivers here run directly into Lake Michigan, and include the Ahnapee, Kewaunee, East Twin, West Twin, Manitowoc, Sheboygan, and Milwaukee. Agriculture is the dominant land use here by area, and there are several medium sized cities. Some large forested wetlands occur in both the eastern and western parts of the Ecological Landscape. The Wolf River bottoms are especially important in the west. Extensive marshes persist in southwestern Green Bay. The ridge and swale complex at Point Beach contains the largest area of coastal forest (with associated wetlands, dunes, and beaches) and constitutes an extremely important repository of regional biodiversity. Population is estimated at 814,770, comprising 14.5% of the state total resulting in a population density of approximately 199 persons/ sq. mile. Public lands include Point Beach State Forest, Harrington Beach and Kohler-Andrae State Parks, several State Wildlife Areas (including several units of Green Bay West Shores, C. D. Besadny, Collins Marsh, Brillion Marsh, and Navarino), State Fishery Areas, and State Natural Areas.

**Southeast Glacial Plains** – Typical of southern Wisconsin; mean growing season of 155 days, mean annual temperature is 45.9 deg. F, mean annual precipitation is 33.6 inches, and mean annual snowfall is 39.4 inches. The climate is suitable for agricultural row crops, small grains, and pastures, which are prevalent in this Ecological Landscape. The dominant landforms are glacial till plains and moraines composed mostly of materials deposited during the Wisconsin Ice Age, but the southwestern part of the Ecological Landscape consists of older, pre-Wisconsin till and the topography is more dissected. Other glacial landforms, including drumlins, outwash plains, eskers, kames and kettles are also well-represented kames, eskers, and kettles. The "Kettle Moraine" is an area of rough topography on the

eastern side of the Southeast Glacial Plains that marks the areas of contact between the Green Bay and Lake Michigan glacial lobes. Numerous excellent examples of glacial features occur and are highly visible in the Kettle Moraine. Soils are derived from lime-rich tills overlain in most areas by a silt-loam loess cap. The Southeast Glacial Plains has the highest aquatic productivity for plants, insects, other invertebrates, and fish of any Ecological Landscape in the state. Significant river systems include the Wolf, Bark, Rock, Fox, Milwaukee, Sugar, Mukwonago, and Sheboygan. Most riparian zones have been degraded. Several clusters of large lakes exist, including the Yahara chain of lakes in and around Madison, and the Lake Winnebago Pool system. Kettle lakes occur within end moraines, in outwash channels, and in ancient riverbeds. This Ecological Landscape contains some huge marshes, as well as fens, sedge meadows, wet prairies, tamarack swamps, and floodplain forests. Many wetlands here have been affected by hydrologic modifications (ditching, diking, tiling), grazing, infestations of invasive plants, and excessive inputs of sediment- and nutrient-laden runoff from croplands. Primarily agricultural cropland (58% of Landscape). Remaining forests occupy only 11% of the land area and major cover types include maple-basswood, oak, lowland hardwoods, and conifer swamps (mostly tamarack-dominated). No large areas of upland forest exist except on the Kettle Interlobate Moraine, where the topography is too rugged to practice intensive agriculture and the soils are not always conducive to high crop productivity. Wetlands are extensive (12% of Landscape, 593,248 acres) and include large marshes and sedge meadows, and extensive forested lowlands within the Lower Wolf River floodplain. Forested lowlands are also significant along stretches of the Milwaukee, Sugar, and Rock rivers. Population is estimated at 1,519,000, comprising 28.5% of the state total resulting in a population density of approximately 204 persons/ sq. mile. Only four percent of the Southeast Glacial Plains is in public ownership (226,230 acres), of which 58% is wetland and 42% is upland.

**Southern Lake Michigan Coastal** – The climate is moderated by Lake Michigan. The mean growing season is 169 days and the mean annual temperature is 47.2deg. F, the longest and warmest of any Ecological Landscape in the state. The mean annual precipitation is 34 inches, the second most precipitation in the state. The mean annual snowfall is 41.9 inches similar to other southern Ecological Landscapes. Lake effect snows occur in areas adjacent to Lake Michigan. The climate (temperature, growing degree days, and precipitation) is suitable for agricultural row crops, small grains, and pastures, which are prevalent land uses in the non-urbanized parts of this Ecological Landscape. Inland the primary landform is level to gently rolling ground moraine. Near Lake Michigan, landforms include subdued ridge and swale topography, beach and dune complexes, and wave-cut clay bluffs. The river mouths within large cities have all been heavily modified. In the uplands, soils are primarily moderately well drained brown calcareous silty clay loam till. In the lowlands, soils are primarily very poorly drained non-acid mucks or silty and clayey lacustrine types. Lake Michigan is the dominant aquatic feature; 26 named lakes (>5,000 total acres); around 1,500 unnamed lakes (most of these are very small ponds, as these waterbodies total only around 1800 acres). Important rivers include the Milwaukee, Menomonee, Kinnickinnic, Root, Des Plaines, Southeast Fox, and Pike. 4% of the Ecological Landscape is open wetland. This is the most urbanized Ecological Landscape in state. Primarily agricultural (39%) and urban (24%), with 16% grassland and 12% upland and lowland forest. Population is estimated at 1,278,572, comprising 23.8% of the state total resulting in a population density of approximately 1,655 persons/ sq. mile. Public ownership is very low, encompassing only 1.1% of the Ecological Landscape.

This Service area can be further broken down into two smaller HUC-8 watersheds, the Pike-Root Rivers (04040002) and the Milwaukee River (04040003).

These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

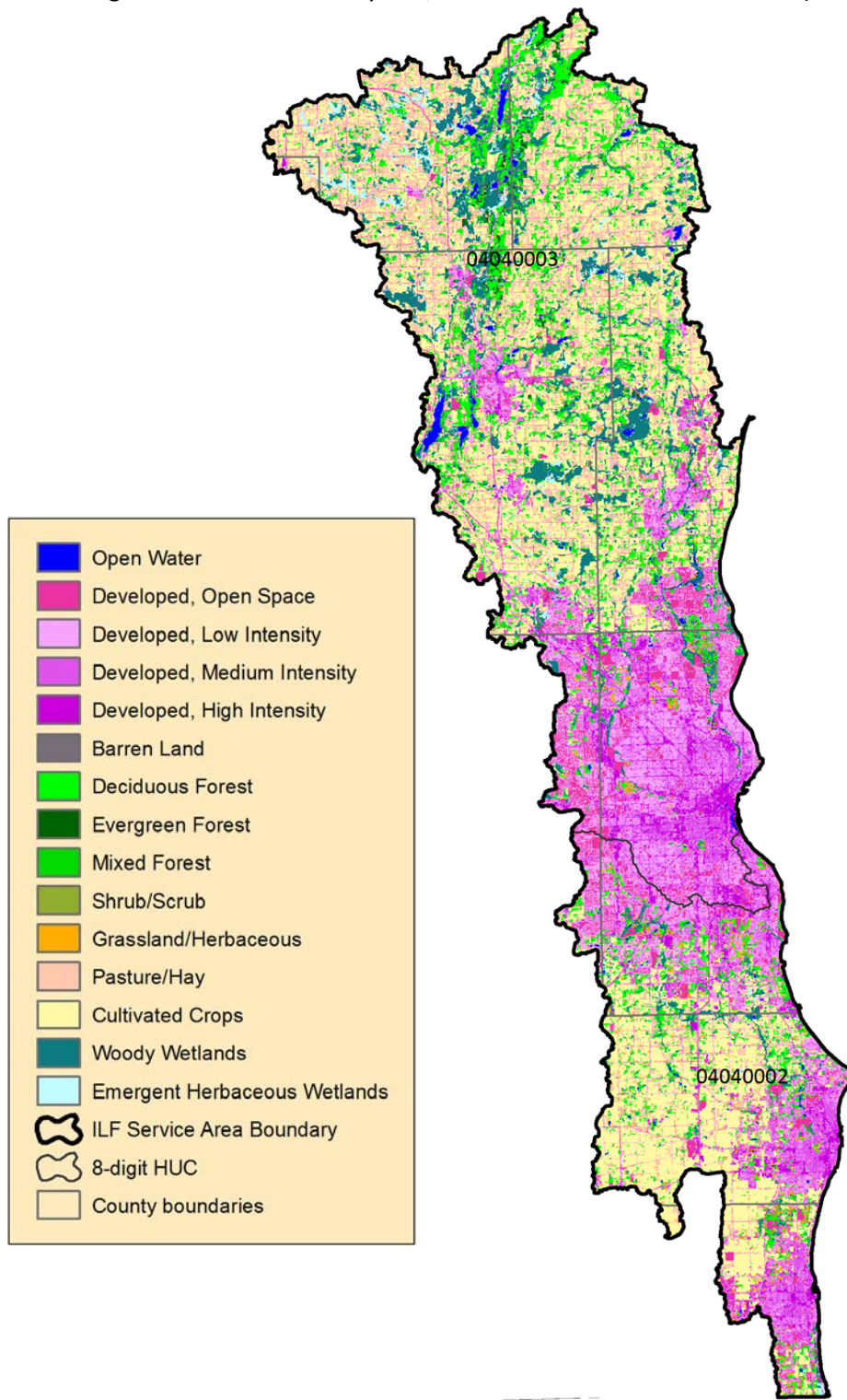
#### **Element II. Threats:**

Overall wetland resource threats within this service are very high and widespread given its extremely high developed and agricultural land use activity representing the most urbanized service area in the state. Overall threats include extremely high habitat fragmentation throughout, agricultural impacts, groundwater depletion in the central portions, water quality throughout resulting in 303d listed impaired waters, invasive species throughout with increased concentrations along the coast, flooding and land use changes. The northern portions of this service area (Southeast Glacial Plains **WDNR 2012**), while highly developed see agricultural land use slightly outweigh development as its major threats of fragmentation and hydrologic modification to resources through ditching, diking, draining, stream re-alignment and impervious surfaces. The southern portion (South Lake Michigan Coastal **WDNR 2012**) has the highest density of developed land use and highest populated areas in the state serving as a hub of transportation, heavy industry, commerce and well as productive agricultural area making resource threats significant and dynamic. Native landscapes are severely fragmented and disturbed by this widespread developed and agricultural setting. Invasive species pose a major threat as their well established and growing footprint is benefitted by many increased pathways. Impaired 303d listed waterways are plentiful and well established making management challenging. Groundwater withdrawals threaten to deplete groundwater and high quantities of impervious surfaces further degrade resource quality. The coastal regions towards the north within this service area (Central Lake Michigan Coast **WDNR 2012**) fall subject to the same threats as the overall region with invasives, shoreline development and fragmentation leading the way as major threat factors.

The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

**Current Land Use:****Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**

(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
04040002 - Pike-Root Rivers	213,675	93,850	83,565	36,260	43.92%	39.11%	16.97%
04040003 - Milwaukee River	562,173	166,338	243,938	151,897	29.59%	43.39%	27.02%

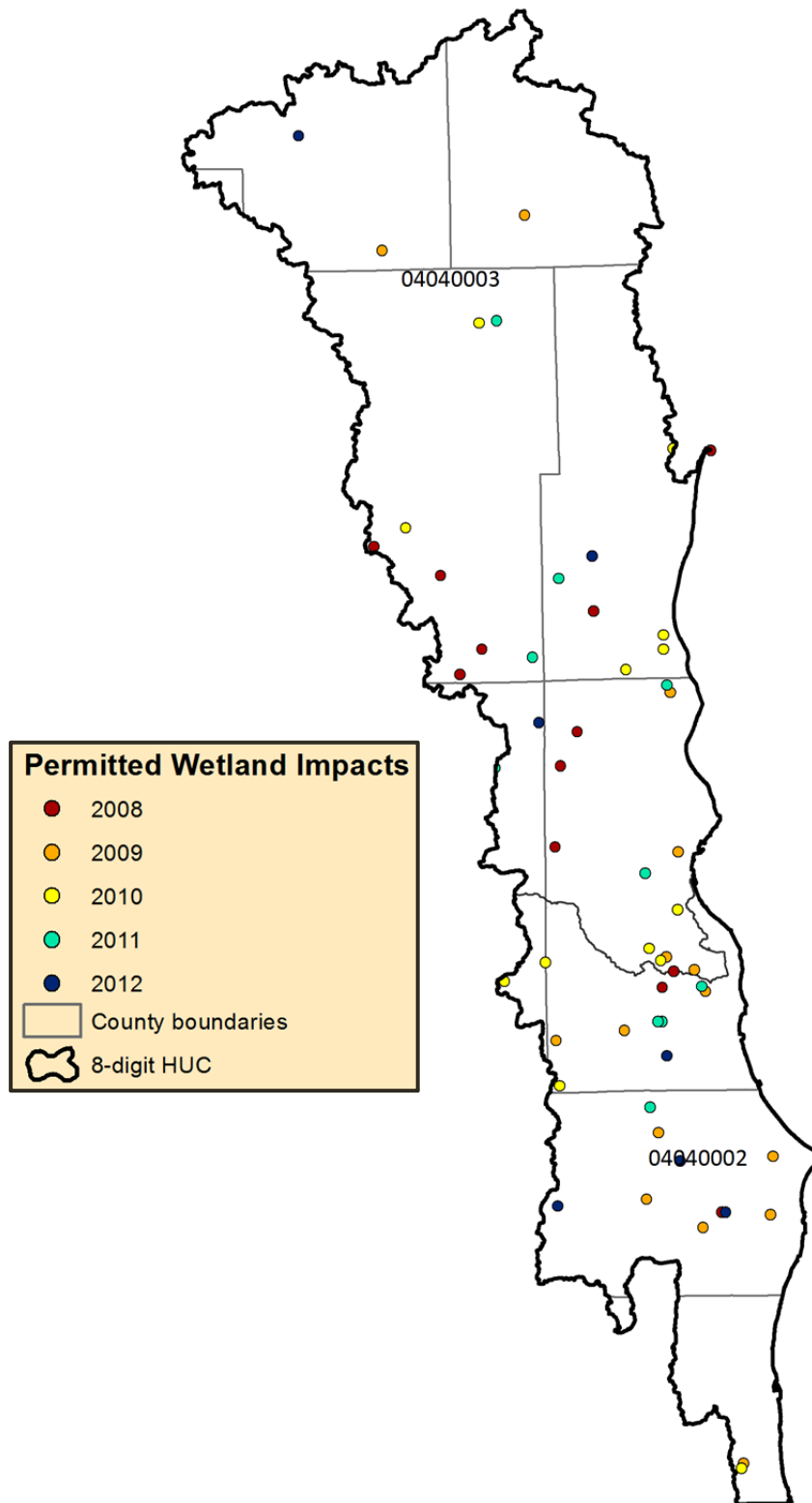
The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that from the perspective of land use changes both HUC-8 watersheds have been heavily impacted through land use implications. The Pike-Root Rivers HUC-04040002 impacts stem from development (43.92% land use) and agriculture (39.11% land use) with only 16.97% of its area containing natural land uses.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
04040002 - Pike-Root Rivers	17%	0%	59%	10%	13%	1%	33,222
04040003 - Milwaukee River	47%	3%	41%	3%	5%	1%	32,733

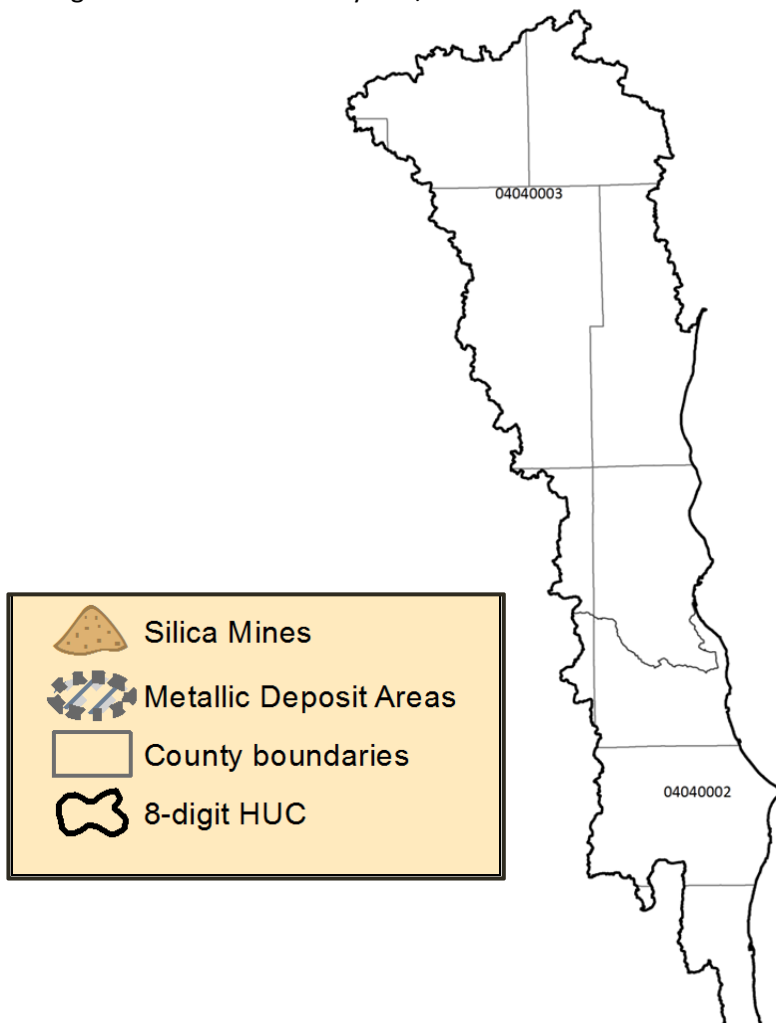
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

The Southwestern Lake Michigan SA does not intersect with any foreseen non-metallic mining nor does it contain portions any current metallic exploration areas. Therefore, these mining activities do not represent any foreseen increased threat with the HUC-8 watersheds that compose this SA.

**SA Potential Mining Impacts per HUC-8**

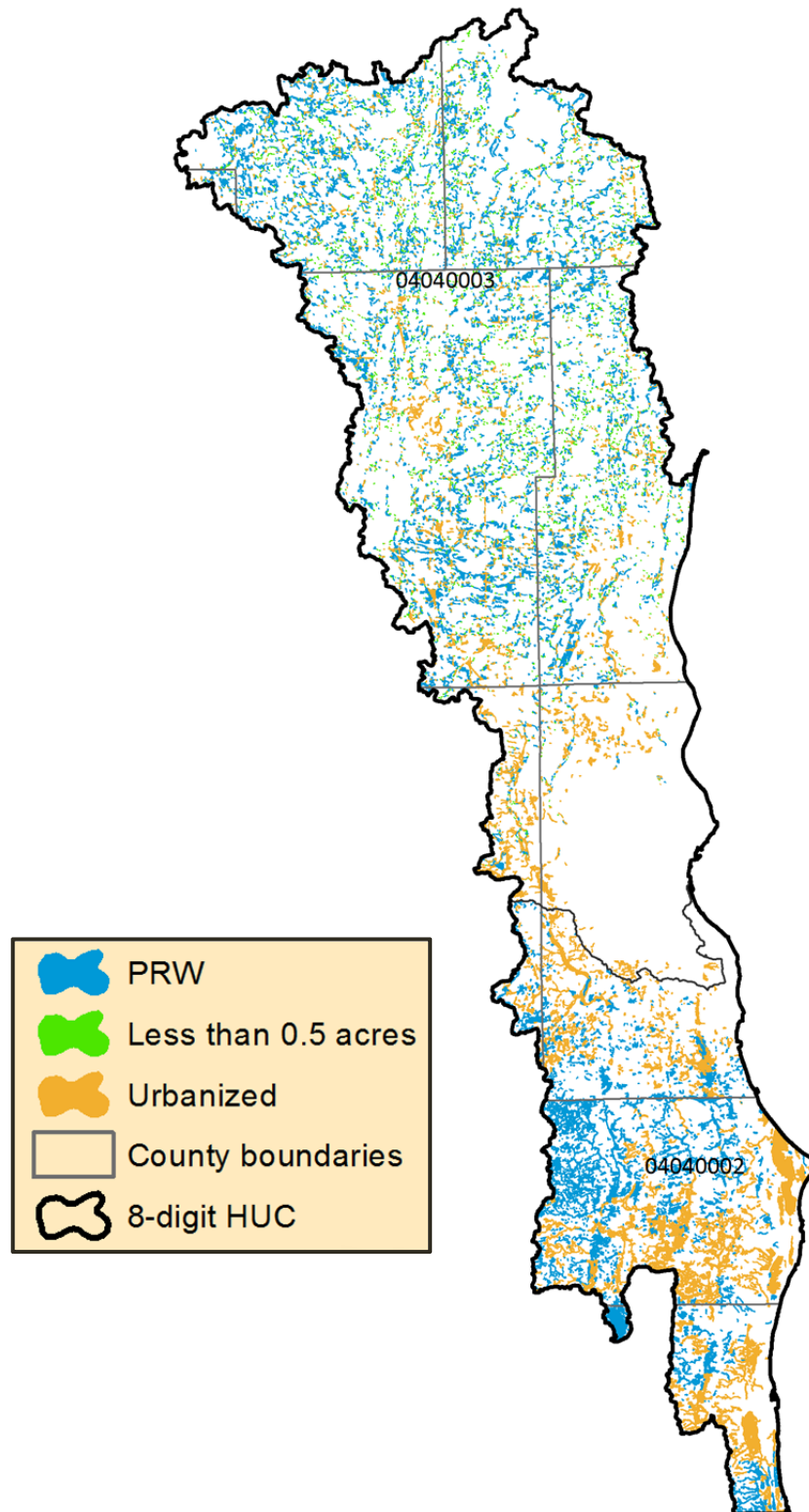
(black straight lines indicate County and/or State boundaries for reference)



**Historic Loss:**

This watershed area follows the pattern of early settlement with the timber industry clearing the lands marking the future construction of roadways and farmland. As lands were cleared agricultural ways took over especially in those flat fertile soil areas along rivers and wetland areas. In the northern portions farming took over, while in the more southern area clearing was followed by settlement and incorporation. Damming of waterways provided the hydropower and mechanical means for grain and saw mills, which adversely impacted wetlands along these fringe areas. This watershed was historically altered by the heaviest impact from early settlement (***WDNR Basin Website 2013***). ). The HUC-8 watersheds within this SA have been analyzed in terms of the Potentially Restorable Wetlands to show the context of historic wetland loss and identify which local areas have sustained the greatest wetland loss.

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



**Overall Estimated Historic Wetland Percent Loss Summary**

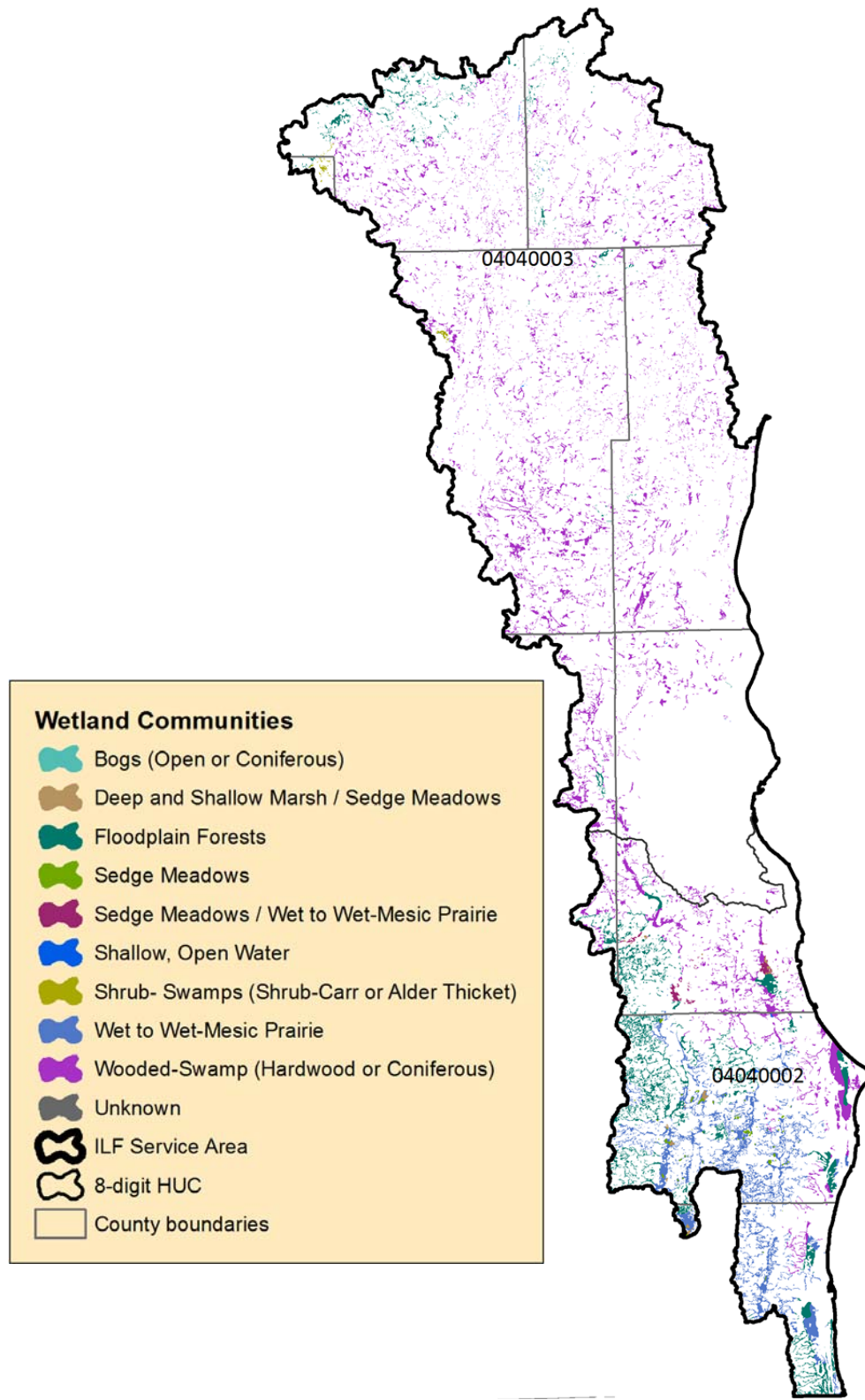
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
04040002 - Pike-Root Rivers	16,374	69.80%
04040003 - Milwaukee River	19,596	25.68%

The information above identifies the Pike-Root Rivers HUC-04040002 as having sustained the greatest historic loss of wetlands.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



November 12, 2014

**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or)
04040002 - Pike-Root Rivers	#DIV/0!	99.98%	87.99%	99.98%	71.11%	85.29%	0.78%	#DIV/0!	93.05%	79.76%
04040003 - Milwaukee River	6.90%	#DIV/0!	26.88%	#DIV/0!	#DIV/0!	13.37%	54.00%	#DIV/0!	#DIV/0!	26.50%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

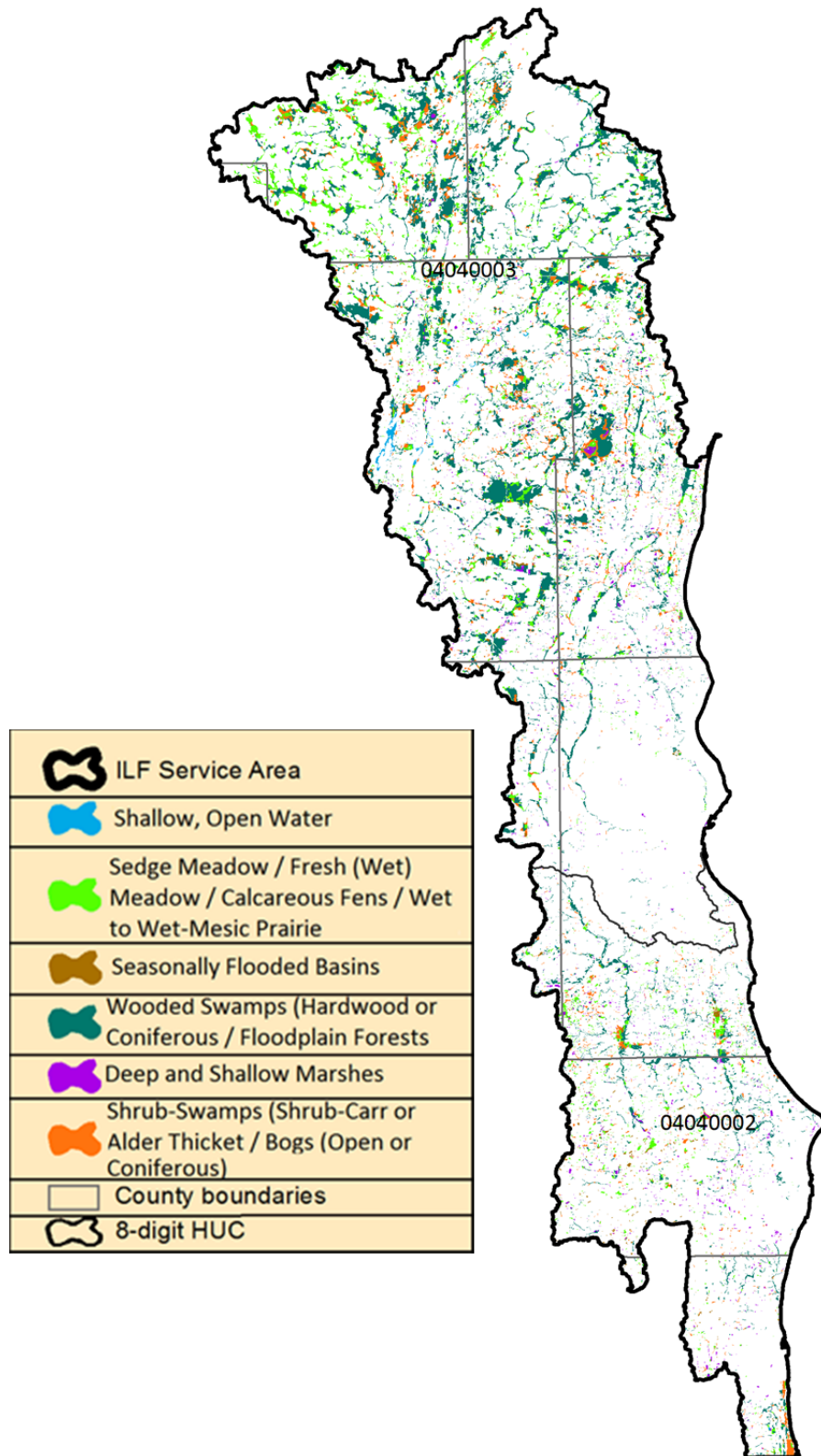
**Element IV. Current Conditions:**

This SA and its HUC-8 watersheds, which all ultimately drain to Lake Michigan, contain the highest amount of developed land and greatest densities of urban population throughout the entire state housing in excess of 1.5 million people (**WDNR Basin Website 2013**). The urban areas of this SA contain very intense pockets of populated area such as the southern portion of the Milwaukee River (04040003) that houses 90% of the population. The water resources in this area are some of the most degraded in the state as decades of urban and rural development have left their mark. This is the only SA that contains HUC-8 watershed areas that have tipped the scales having development land use activities resulting in a greater impact than agricultural activities, although both land uses have had adverse impacts. Most historical wetland have been drained and filled with streams undergoing major channelization or relocations and there are currently no classified coldwater streams located within the Root-Pike Rivers (04040003) watershed areas of this SA. This area does contain areas of shoreline and Lake Michigan coastal stretches providing potential opportunities for unique wetland projects.

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04040003 - Milwaukee River	860.20	17,300.32	986.92	49,644.80	3,191.99	12,162.53	84,647.01
04040002 - Pike-Root Rivers	19.33	3,476.23	868.20	7,465.57	1,617.63	2,520.10	16,235.77

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
04040003 - Milwaukee River	1.02%	20.44%	1.17%	58.65%	3.77%	14.37%	100.00%
04040002 - Pike-Root Rivers	0.12%	21.41%	5.35%	45.98%	9.96%	15.52%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other

important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.

8. Restore, enhance, establish and/or preserve 15 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

#### **Pike-Root Rivers                    HUC-04040002**

This watershed has lost approximately 69.80% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 33.222 acres of wetland loss, which is high for this service area. Permit trends identify Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies, Calcareous Fens, Wooded Swamps and Floodplain Forests as the wetland types under the greatest pressure from permitted actions. Sedge Meadows, Wet to Wet-Mesic Prairies and Floodplain Forests have sustained the greatest estimated historic percentage losses, which are reinforced by estimated acreage quantity losses across these categories. The overall land use within this watershed is mainly developed at 43.92%, representing the second highest developed area program wide. Agriculture areas are 39.11%, followed by natural at 16.97% depicting an overall highly disturbed and urbanized watershed. The agriculture areas are composed of mainly cultivated crops with some pasture/hay area, while natural areas are comprised of deciduous forest, woody wetlands and grassland/herbaceous area. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall forested/ herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present given the highly urbanized and disturbed structure of this watershed. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Ephemeral Pond and Calcareous Fen.

#### **Milwaukee River                    HUC-04040003**

This watershed has lost approximately 25.38% of its overall historic wetlands, which is the lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 32.733 acres of wetland loss, which is high for this service area. Permit trends do not specify the wetland type for most (47%) of the permitted actions. Shrub Swamps and Floodplain Forests have sustained the greatest estimated historic percentage losses at 54.00% and 26.88% respectively, followed by Wooded

Wetlands at 26.50%. A review of the estimated historic acreage losses reinforces quantity losses across these categories. The overall land use within this watershed is mainly agriculture at 43.39%, followed by developed at 29.59% and natural at 27.02%. The agriculture areas are mainly cultivated crops with some pasture/hay area, while natural areas are comprised of deciduous forest, woody wetlands and emergent/herbaceous wetlands. Current mapped wetlands are dominated by Wooded Swamps, Floodplain Forests, Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens, Wet to Wet-Mesic Prairies and Shrub Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps, Floodplain Forests and Shrub Swamps will fit well within this watershed given the overall mix of forested and emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen, Great Lakes Ridge and Swale, Interdunal and Open Bog.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps, Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond, Calcareous Fen, Great Lakes Ridge and Swale, Interdunal and Open Bog.

#### **Existing Advanced Watershed Plans (AWP):**

Kline, Joanne, Bernthal, Thomas, Burzynski, Marsha and Barrett, Kate. (June 2006). *Milwaukee River Basin Wetland Assessment Project: Developing Decision Support Tools for Effective Planning*. Final Report to U.S. EPA – Region V Wetland Grant #97593901. Wisconsin Department of Natural Resources. Madison, Wisconsin. Retrieved from: [http://dnr.wi.gov/topic/wetlands/documents/Mukwonago\\_Version\\_MRPWAP\\_August\\_17.pdf](http://dnr.wi.gov/topic/wetlands/documents/Mukwonago_Version_MRPWAP_August_17.pdf)

#### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

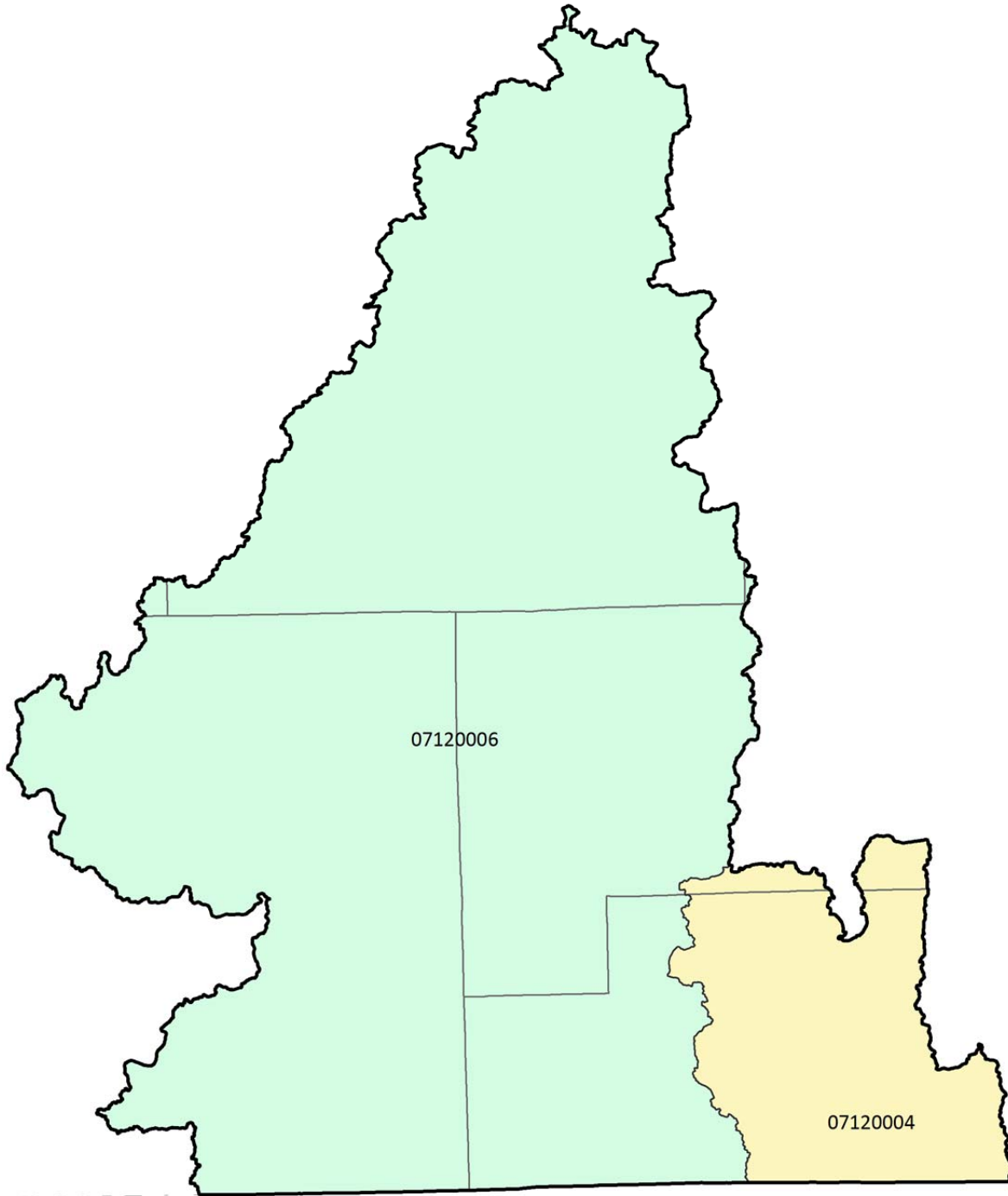
**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Upper Illinois CPF

### Element I. Service area:

**Overall SA Area with separate HUC-8 watersheds designated in color**  
(county & state boundaries shown in straight lines for further reference)

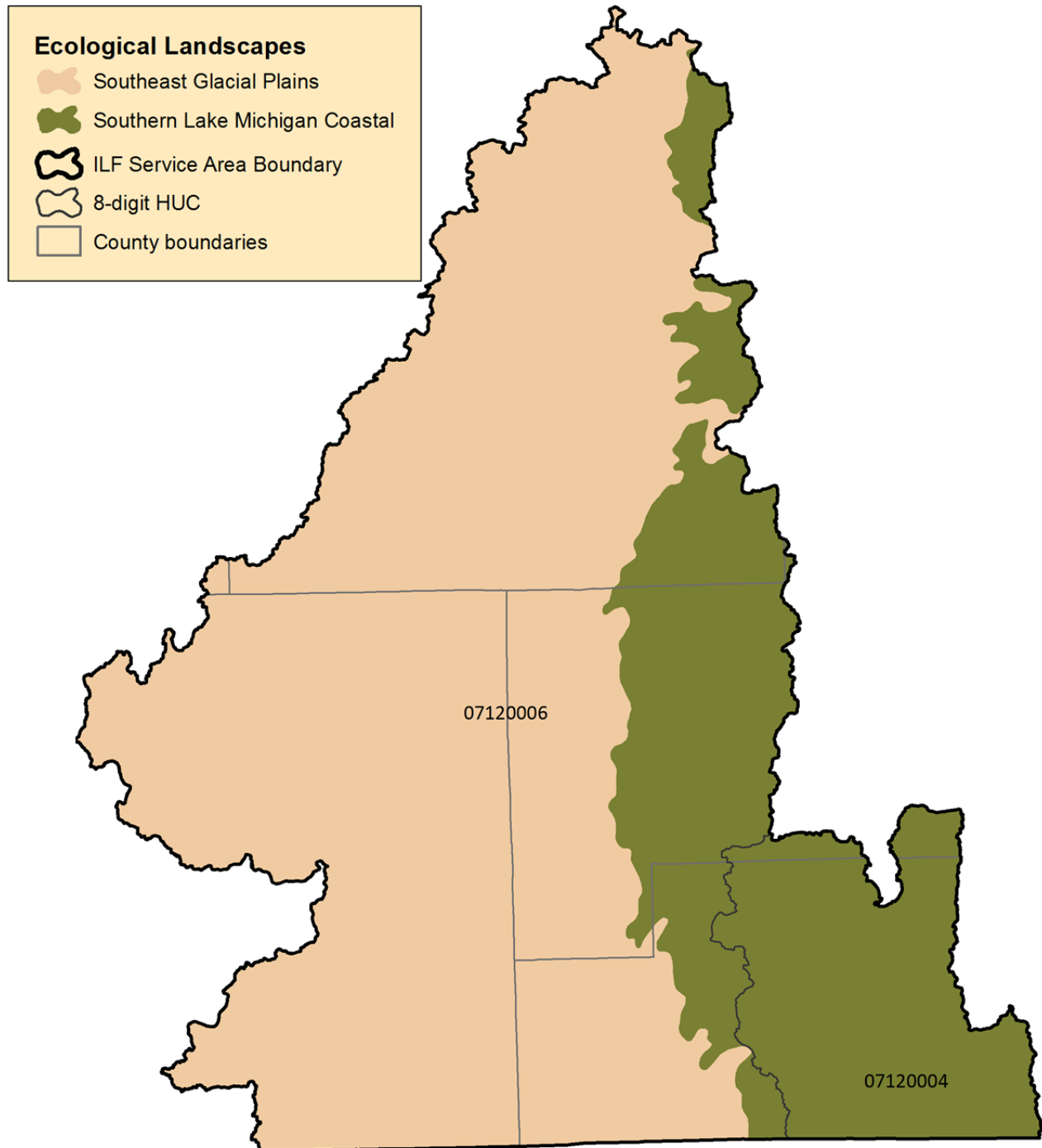


November 12, 2014

The Upper Illinois Service area is located in the south eastern portion of Wisconsin comprised of Waukesha, Washington, Jefferson, Walworth, Racine, Milwaukee and Kenosha counties and drains an area approximately 1,088 square miles.

Ecological Landscapes include (WDNR 2012):

#### Ecological Landscapes per HUC 8



**Southeast Glacial Plains** – Typical of southern Wisconsin; mean growing season of 155 days, mean annual temperature is 45.9 deg. F, mean annual precipitation is 33.6 inches, and mean annual snowfall is 39.4 inches. The climate is suitable for agricultural row crops, small grains, and pastures, which are prevalent in this Ecological Landscape. The dominant landforms are glacial till plains and moraines composed mostly of materials deposited during the Wisconsin Ice Age, but the southwestern part of the Ecological Landscape consists of older, pre-Wisconsin till and the topography is more dissected. Other glacial landforms, including drumlins, outwash plains, eskers, kames and kettles are also well-represented kames, eskers, and kettles. The "Kettle Moraine" is an area of rough topography on the eastern side of the Southeast Glacial Plains that marks the areas of contact between the Green Bay and Lake Michigan glacial lobes. Numerous excellent examples of glacial features occur and are highly visible in the Kettle Moraine. Soils are derived from lime-rich tills overlain in most areas by a silt-loam loess cap. The Southeast Glacial Plains has the highest aquatic productivity for plants, insects, other invertebrates, and fish of any Ecological Landscape in the state. Significant river systems include the Wolf, Bark, Rock, Fox, Milwaukee, Sugar, Mukwonago, and Sheboygan. Most riparian zones have been degraded. Several clusters of large lakes exist, including the Yahara chain of lakes in and around Madison, and the Lake Winnebago Pool system. Kettle lakes occur within end moraines, in outwash channels, and in ancient riverbeds. This Ecological Landscape contains some huge marshes, as well as fens, sedge meadows, wet prairies, tamarack swamps, and floodplain forests. Many wetlands here have been affected by hydrologic modifications (ditching, diking, tiling), grazing, infestations of invasive plants, and excessive inputs of sediment- and nutrient-laden runoff from croplands. Primarily agricultural cropland (58% of Landscape). Remaining forests occupy only 11% of the land area and major cover types include maple-basswood, oak, lowland hardwoods, and conifer swamps (mostly tamarack-dominated). No large areas of upland forest exist except on the Kettle Interlobate Moraine, where the topography is too rugged to practice intensive agriculture and the soils are not always conducive to high crop productivity. Wetlands are extensive (12% of Landscape, 593,248 acres) and include large marshes and sedge meadows, and extensive forested lowlands within the Lower Wolf River floodplain. Forested lowlands are also significant along stretches of the Milwaukee, Sugar, and Rock rivers. Population is estimated at 1,519,000, comprising 28.5% of the state total resulting in a population density of approximately 204 persons/ sq. mile. Only four percent of the Southeast Glacial Plains is in public ownership (226,230 acres), of which 58% is wetland and 42% is upland.

**Southern Lake Michigan Coastal** – The climate is moderated by Lake Michigan. The mean growing season is 169 days and the mean annual temperature is 47.2deg. F, the longest and warmest of any Ecological Landscape in the state. The mean annual precipitation is 34 inches, the second most precipitation in the state. The mean annual snowfall is 41.9 inches similar to other southern Ecological Landscapes. Lake effect snows occur in areas adjacent to Lake Michigan. The climate (temperature, growing degree days, and precipitation) is suitable for agricultural row crops, small grains, and pastures, which are prevalent land uses in the non-urbanized parts of this Ecological Landscape. Inland the primary landform is level to gently rolling ground moraine. Near Lake Michigan, landforms include subdued ridge and swale topography, beach and dune complexes, and wave-cut clay bluffs. The river

mouths within large cities have all been heavily modified. In the uplands, soils are primarily moderately well drained brown calcareous silty clay loam till. In the lowlands, soils are primarily very poorly drained non-acid mucks or silty and clayey lacustrine types. Lake Michigan is the dominant aquatic feature; 26 named lakes (>5,000 total acres); around 1,500 unnamed lakes (most of these are very small ponds, as these waterbodies total only around 1800 acres). Important rivers include the Milwaukee, Menomonee, Kinnickinnic, Root, Des Plaines, Southeast Fox, and Pike. 4% of the Ecological Landscape is open wetland. This is the most urbanized Ecological Landscape in state. Primarily agricultural (39%) and urban (24%), with 16% grassland and 12% upland and lowland forest. Population is estimated at 1,278,572, comprising 23.8% of the state total resulting in a population density of approximately 1,655 persons/ sq. mile. Public ownership is very low, encompassing only 1.1% of the Ecological Landscape.

This Service area can be further broken down into two smaller HUC-8 watersheds, the Des Plaines River (07120004) and the Upper Fox River (07120006).

These localized HUC-8 watersheds have been analyzed utilizing a watershed approach under this CPF to set goals, objectives and identify priority areas for selecting mitigation projects in areas in most need of wetlands and their associated functions based on threats, historic loss and current conditions.

#### **Element II. Threats:**

Overall wetland resource threats within this service are very high and widespread given its extremely high developed and agricultural land use activity representing one of the most urbanized service areas in the state. Overall threats include extremely high habitat fragmentation throughout, agricultural impacts throughout, groundwater depletion in the northern portions, water quality throughout the western portions resulting in 303d listed impaired waters, invasive species throughout with increased concentrations in the north, flooding and land use changes. The western region of this service area (Southeast Glacial Plains **WDNR 2012**), while highly developed see agricultural land use outweigh development as its major threats of fragmentation and hydrologic modification to resources through ditching, diking, draining, stream re-alignment and impervious surfaces. Impaired 303d listed waterways are plentiful and well established making management challenging. The eastern region (South Lake Michigan Coastal **WDNR 2012**) has the highest density of developed land use and highest populated areas in the state serving as a hub of transportation, heavy industry, commerce and well as productive agricultural area making resource threats significant and dynamic. Native landscapes are severely fragmented and disturbed by this widespread agricultural and developed setting. Invasive species pose a major threat as their well established and growing footprint is benefitted by many increased pathways and constant disturbed state from crop rotation. Groundwater withdrawals concentrated greater in the northern extents threaten to deplete groundwater.

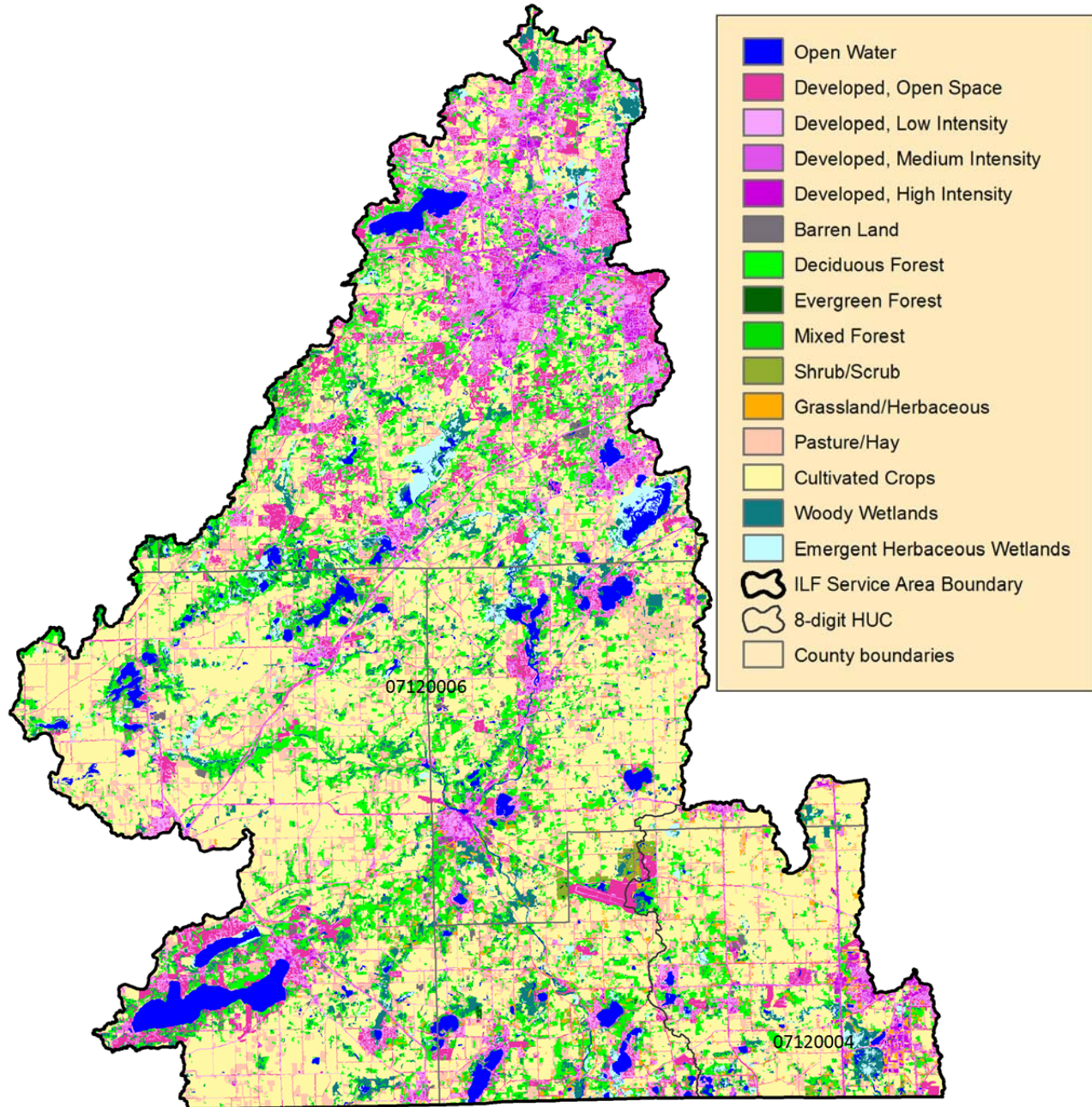
The threats to this service area have been analyzed for each HUC-8 watershed in terms of the current land use implications, Corps based permit trends over the past 5 years, the general wetland types that have been impacted and any anticipated increased threats from activities such as mining or permit impacts foreseen on the horizon. The land use information will identify changes to the landscape that have occurred over time from development and/or agriculture activities along with the quantity of lands

still existing in a natural form. Those HUC-8 watersheds that have higher percentages of developed and/or agriculture land and low percentage of natural land use shall be viewed as being under an increased threat of wetland impacts. Corps permitted wetland impact data from 2008-2012 has been plotted in each HUC-8 watershed and tabulated to show which HUC-8 is trending as the area of greatest permitted wetland loss along with the general type of wetland most impacted. The anticipated future threats stem from whether any HUC-8 watershed intersects with known activity zones for non-metallic mining (Frac Sand), exploration areas for metallic mining and any foreseen permits that will result in wetland impacts above the established 5 year annual average.

**Current Land Use:**

**Land Use (NLCD 2006) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)

**Land Use (NLCD 2006) and Percentage of Major Land Use Categories per HUC-8**

(sorted from least to greatest % natural)

HUC	Total HUC-8 Acres	Total Developed Acres	Total Agriculture Acres	Total Natural Acres	% Developed	% Agriculture	% Natural
07120004 - Des Plaines River	86,363	14,141	52,056	20,166	16.37%	60.28%	23.35%
07120006 - Upper Fox River	592,579	121,861	294,557	176,161	20.56%	49.71%	29.73%

The localized HUC-8 watersheds within this service area were analyzed in terms of the current land use as depicted in the NLCD 2006 dataset. In order to focus on the HUC-8's that are under the greatest threat from development and agriculture activities several of the overall land use categories were

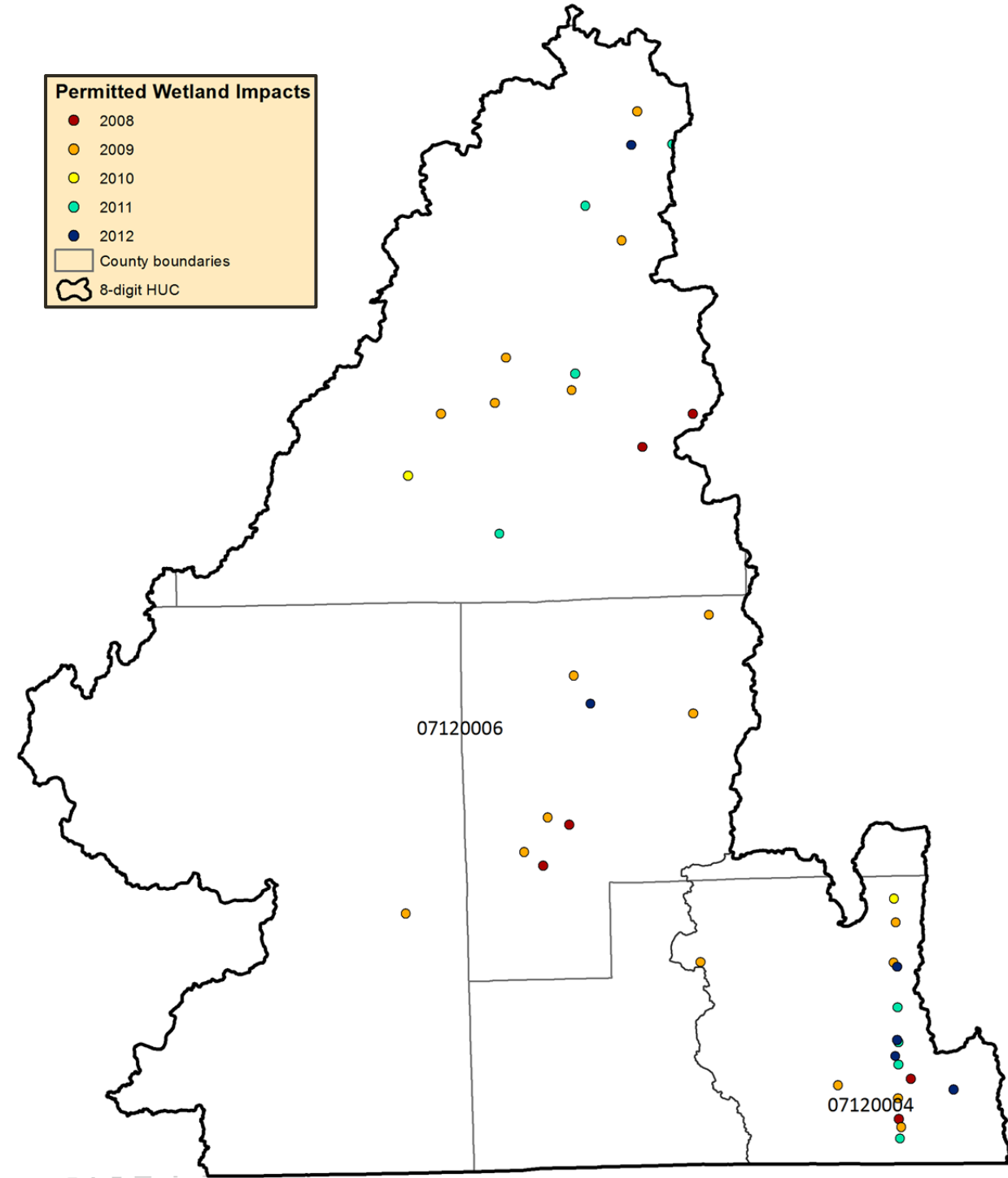
combined to ultimately reflect the percentage of total developed acres, percentage of total agriculture acres and the remaining percentage of naturally existing acres. The table above was then sorted to show the HUC-8 areas with the smallest percentage of naturally occurring land uses, which generally implicates the HUC-8 where development and/or agriculture poses the greatest threat. The table, for example shows that from the perspective of land use changes both HUC-8 watersheds have been heavily impacted through agriculture and development. Notably, the Des Plaines HUC-07120004 has 60.28% agriculture land use and 16.39% developed land use with only 23.35% existing in natural land use.

**Corps Permit Trends:**

Corps permitted wetland impacts from 2008-2012 were plotted and tabulated to identify trends in the type of wetland and HUC-8 location that has sustained the greatest wetland loss from permitted actions where compensatory mitigation was required. The resulting trends have been utilized as one of the considerations in establishing the goals and objectives that identify the type of wetlands to target in each HUC-8 watershed when selecting mitigation projects.

**Corps Permit Impacts (2008-2012) per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Corps 2008-2012 Permit Impacts by Wetland Type per HUC-8**

(sorted from greatest to least total acres impacted)

HUC	No Type Specified	Shallow, Open Water	Deep and Shallow Marshes	Sedge Meadow, Fresh (Wet) Meadow, Wet to Wet-Mesic Prairie, Calcareous Fens	Wooded Swamps (Hardwood or Coniferous), Floodplain Forests	Shrub Swamps (Shrub-Carr or Alder Thicket)	TOTAL ACRES Impacted 2008-2012
07120004 - Des Plaines River	52%	0%	36%	4%	7%	1%	17,577
07120006 - Upper Fox River	21%	0%	58%	12%	9%	0%	12,152

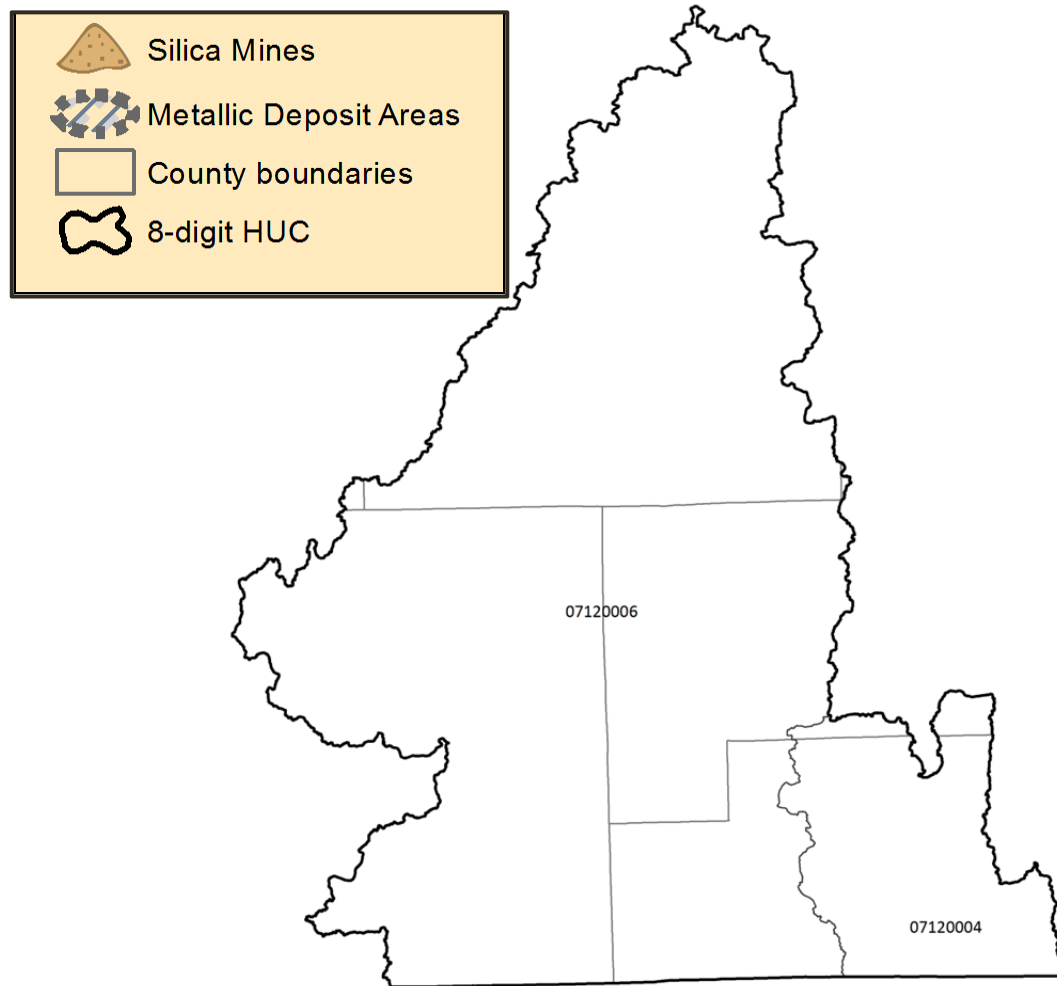
The information above identifies which HUC-8 is trending as the having lost the most wetland through permit activity along with percentages for the types of wetlands impacted, thus guiding the targeted wetland type goals and objectives for each HUC-8.

**Anticipated Future Threats:**

The Upper Illinois SA does not intersect with any foreseen non-metallic mining nor does it contain portions any current metallic exploration areas. Therefore, these mining activities do not represent any foreseen increased threat with the HUC-8 watersheds that compose this SA.

**SA Potential Mining Impacts per HUC-8**

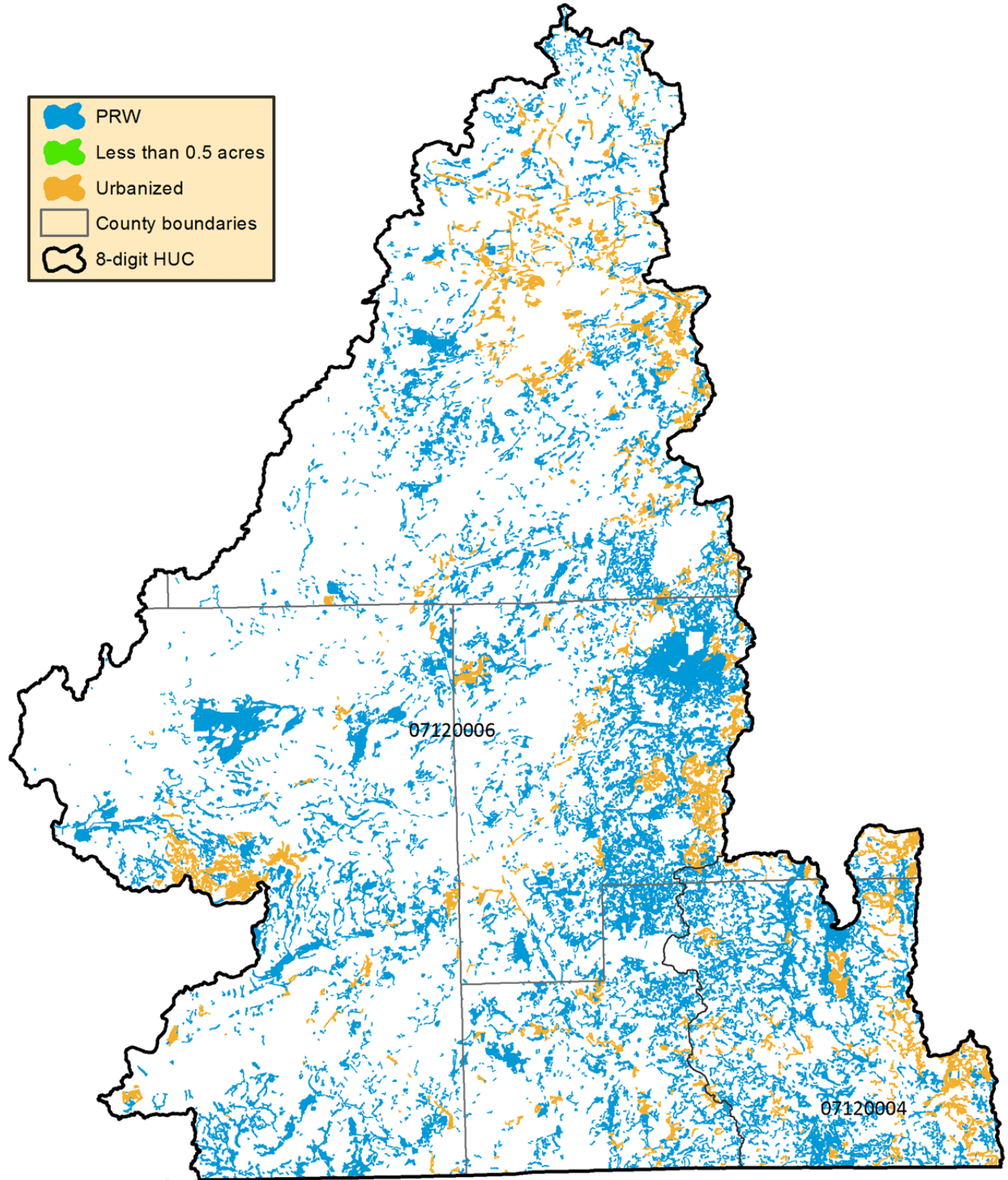
(black straight lines indicate County and/or State boundaries for reference)



**Element III. Historic Loss:**

This watershed is similar to other portions of the heavily urbanized southeastern portion of the state in its historic loss of wetlands. As this area was initially settled forest cover was cleared and utilized in the timber industry followed by agriculture and cultivated crops. This area was also heavily developed as the cities grew resulting in wetlands being filled, hydrology altered and habitat significantly segmented throughout the watershed. This area has also been greatly impacted by early settlement with little of pre-settlement vegetation and wetlands remaining (*WDNR Basin Website 2013*).

**Overall Estimated Historic Wetland Loss (all PRW categories) per HUC-8**  
(black straight lines indicate County and/or State boundaries for reference)



**Overall Estimated Historic Wetland Percent Loss Summary**

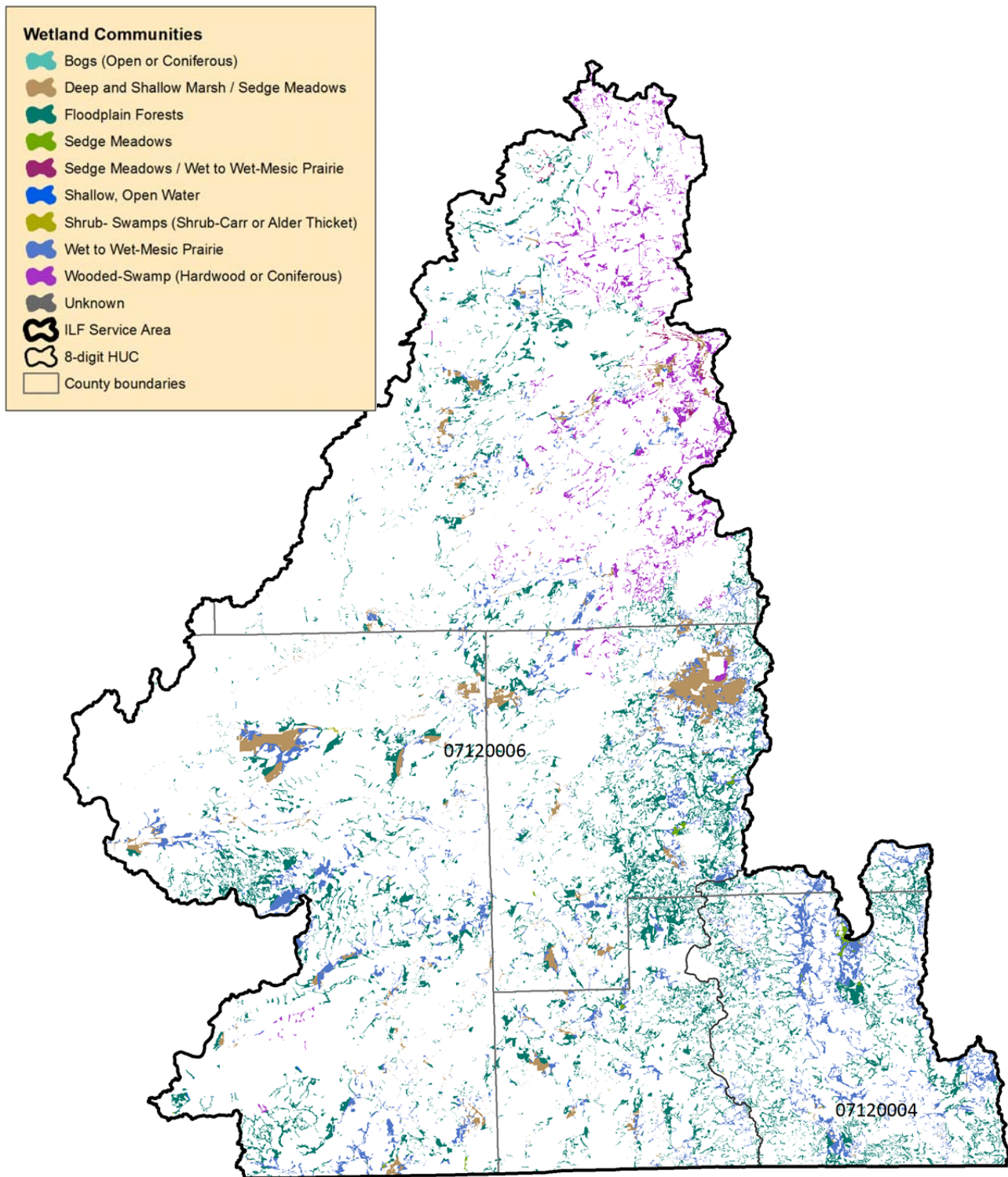
(sorted from greatest to least historic loss)

<b>HUC</b>	<b>Acres of PRW Opportunity</b>	<b>Historic Wetland Loss % (Total PRW all / Total historic)</b>
07120004 - Des Plaines River	10,929	59.71%
07120006 - Upper Fox River	48,773	39.84%

The information above identifies that the Des Plaines River HUC-07120004 has sustained the greatest historic loss of wetlands.

**Estimated Historic Loss of Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Estimated Percent Loss of Historic Wetland Types per HUC-8**

(a #DIV/0! value means not applicable &amp; a 0.00% value suggests no loss of corresponding wetland type)

HUC	Bogs (Open or Coniferous)	Deep and Shallow Marsh / Sedge Meadows	Floodplain Forests	Sedge Meadows	Sedge Meadows / Wet to Wet-Mesic Prairie	Shallow, Open Water	Shrub-Swamps (Shrub-Carr or Alder Thicket)	Unknown	Wet to Wet-Mesic Prairie	Wooded-Swamp (Hardwood or Coniferous)
07120004 - Des Plaines River	#DIV/0!	11.32%	67.30%	36.19%	#DIV/0!	19.05%	1.50%	#DIV/0!	72.02%	#DIV/0!
07120006 - Upper Fox River	#DIV/0!	35.69%	47.31%	35.46%	42.60%	20.74%	2.19%	#DIV/0!	57.39%	37.50%

The information above was utilized as the main basis for the goals and objectives directing the type of wetland projects that will be preferred when prioritizing and selecting proposals. For example, while the overall percentage wetland can vary widely throughout a service area specific wetland types may have sustained greater losses than others. This targeted information can ensure that the wetland type of greatest need is restored, enhanced, established or preserved. However, other factors will be utilized when setting goals and objectives to ensure the sustainability and compatibility of projects considering current land use and wetland community types.

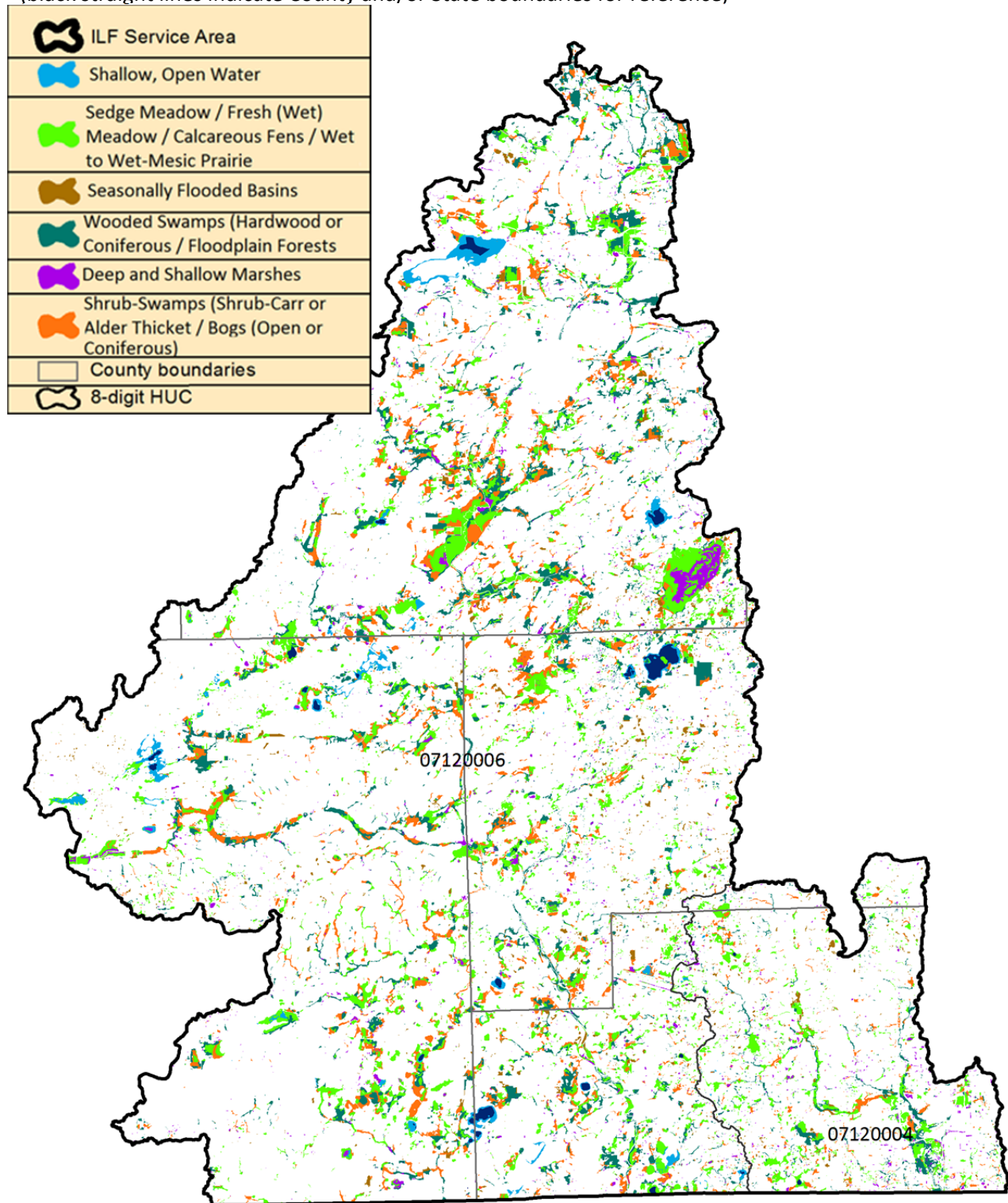
**Element IV. Current Conditions:**

The Upper Illinois Service area drains to the Fox River (Upper, Middle and Lower) from start to finish and is home to approximately half a million people. Next to farmlands land use contains heavily urbanized land use with roughly 20% in a developed state. The overall SA has been affected by development and increases in impervious area, which has created a lack of infiltration for groundwater recharge and exasperated the flashy nature of area streams resulting in sedimentation from erosion. The majority of historic wetlands have been drained or filled and in general the overall health of the watershed is poor with a considerable number of waterways being adversely affected through point and non-point runoff, erosion and toxic discharges such as PCB's (Polychlorinated biphenyls). Historically people traveled great distances to visit the many "spring houses" that dotted the landscape containing artisanal groundwater discharges; however this practice has since been abandoned (*WDNR Basin Website 2013*).

WI Wetland Inventory digital mapping was utilized to map and tabulate the current wetland conditions of the overall Service area as well as depict the quantity and location of major wetland types for each HUC-8 watershed. This digital information was then utilized to calculate the relative frequency of each major wetland category within each HUC-8 to help guide the goals and objectives for selecting mitigation projects in compatible wetland areas.

**Current Mapped (WWI) Wetland Types per HUC-8**

(black straight lines indicate County and/or State boundaries for reference)



**Current ACRES of Mapped (WWI) Wetland Types per HUC-8**

(sorted by total wetland quantity from greatest to least)

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07120006 - Upper Fox River	4,516.20	31,840.44	3,819.48	24,715.62	7,040.54	22,656.89	95,424.48
07120004 - Des Plaines River	45.87	4,678.65	773.91	2,318.59	769.36	1,577.11	10,291.35

**Relative Frequency of Wetland Types per HUC-8**

HUC	Shallow, Open Water	Sedge Meadows / Fresh (Wet) Meadow / Calcareous Fens / Wet to Wet-Mesic Prairie	Seasonally Flooded Basins	Wooded-Swamp (Hardwood or Coniferous) / Floodplain Forests	Deep and Shallow Marshes	Shrub-Swamp (Shrub-Carr or Alder Thicket) / Bogs (Open or Coniferous)	Grand Total
07120006 - Upper Fox River	4.73%	33.37%	4.00%	25.90%	7.38%	23.74%	100.00%
07120004 - Des Plaines River	0.45%	45.46%	7.52%	22.53%	7.48%	15.32%	100.00%

**Element V. Goals and Objectives:**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other

important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.

8. Restore, enhance, establish and/or preserve 15 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

#### **Des Plaines River      HUC-07120004**

This watershed has lost approximately 59.71% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 17.577 acres of wetland loss, which is the highest for this service area. Permit trends do not specify the wetland type for the majority (52%) of permitted actions. Wet to Wet-Mesic Prairies and Floodplain Forests have sustained the greatest estimated historic percentage losses at 72.02% and 67.30% respectively, followed by Sedge Meadows. A review of the estimated historic acreage loss quantities reinforces significant quantity losses across these categories. The overall land use within this watershed is overwhelmingly agriculture at 60.28%, followed by natural at 23.35% and developed at 16.37%. The agriculture areas are composed of mainly cultivated crops, while natural areas are comprised of deciduous forest, woody wetlands and grassland/herbaceous area. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Wooded Swamps and Floodplain Forests. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall forested/ grassland/herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

#### **Upper Fox River      HUC-07120006**

This watershed has lost approximately 39.84% of its overall historic wetlands, which is the lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 12.152 acres of wetland loss, which is moderate for this service area. Permit trends identify Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Calcareous Fens as the wetland types under the greatest pressure from permitted actions. Wet to Wet-Mesic Prairies and Floodplain Forests have sustained the greatest estimated historic percentage losses at 57.39% and 47.31% respectively, followed by Sedge Meadows. A review of the estimated historic acreage loss quantities reinforces significant quantity losses across these categories. The overall land use within this

watershed is mainly agriculture at 49.71%, followed by natural at 29.73% and developed at 20.56%. The agriculture areas are composed of overwhelmingly cultivated crops, while natural areas are comprised of deciduous forest, woody wetlands, open water and emergent herbaceous wetlands. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall forested, emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Floodplain Forests.
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Ephemeral Pond and Calcareous Fen.

**Existing Advanced Watershed Plans (AWP): None**

#### **Element VI. Prioritization Strategy for Site Selection and Planning**

**First**, select mitigation projects that meet the core requirements listed under Appendix A, element VI. in order to determine those meeting initial pre-requisites.

**Second**, select mitigation projects based on their capacity to provide one or more wetland functions and ability to achieve the goals and objectives as stated under this CPF on both the service area and HUC-8 watershed levels.

**Third**, select mitigation projects that are located within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

**Fourth**, prioritize mitigation projects that are located within high opportunity HUC-8 watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

***Appendix B. – Credit Fees per Service area***

WWCT PROGRAM YEAR 2014-2015

<b>Service area</b>	<b>Credit Fee</b>	<b>Major Basin Area</b>
Lake Superior	\$58,000	Lake Superior Basin
St. Croix	\$60,000	Mississippi River Basin
Chippewa	\$60,000	Mississippi River Basin
Upper Mississippi – Black Root	\$60,000	Mississippi River Basin
Upper Wisconsin	\$60,000	Mississippi River Basin
Lower Wisconsin	\$60,000	Mississippi River Basin
Upper Mississippi – Maquoketa Plum	\$60,000	Mississippi River Basin
Rock	\$60,000	Mississippi River Basin
Upper Illinois	\$60,000	Mississippi River Basin
Northwestern Lake Michigan	\$61,000	Lake Michigan Basin
Fox	\$61,000	Lake Michigan Basin
Southwestern Lake Michigan	\$61,000	Lake Michigan Basin

***Appendix C. – Annual Report Outline***

# WWCT Annual Report Outline

Revised: 10/17/2014

- I. Introduction: Provides general purpose of program and describes overall trends, use and status.
- II. Program Summary: Provides a summary of program activity and progress.
- III. Credit Transaction Summary
  - a. Program Credit Ledger
  - b. Mitigation of Impacts
    - i. Credit vs. Debit Table
    - ii. Credit Liabilities and Compliance
  - c. Primary Service Area Credit Ledgers
    - i. Advanced Credit Balances
    - ii. Released Credit Fulfillment
- IV. Program Financial Status
  - a. Financial Tables (revenue, expenses and interest)
  - b. Administrative Fund Status
  - c. Contingency Fund Status
- V. Request For Proposals Summary
  - a. PSA Activity
  - b. Project Status
- VI. Project Summary
  - a. Individual PSA Descriptions
  - b. Contract Awards
  - c. Financial Review & Status of Projects
  - d. Credit Generation Summary
- VII. Credit Fee Evaluation
- VIII. Overall Program Evaluation Summary
  - a. Achievement of Goals and Objectives
  - b. Compensatory Mitigation Compliance vs. Credits Sold
  - c. Programmatic Framework
  - d. Conclusion and Associated Actions
- IX. Exhibits
  - a. Exhibit A: Program Credit Ledger
  - b. Exhibit B: PSA Credit Ledgers
  - c. Exhibit C: Credit Liabilities and Mitigation Compliance
  - d. Exhibit D: Financial Ledger
  - e. Exhibit E: Project Credit Generation Tables
  - f. Exhibit F: Credit Fee Schedule

[illegible]

## Revised 9-19-2014

[illegible]

Program Wide Starting Advanced Credits:	710
Program Wide Total Advanced Credits Sold:	0
Program Wide Total Released Credits Generated:	0
Program Wide Available Advanced Credits:	710

[illegible]

Starting Advanced Credits:	75
Total Advanced Credits Sold:	0
Total Released Credits Generated:	0
Available Advanced Credits:	75

[illegible]

Starting Advanced Credits:	30
Total Advanced Credits Sold:	0
Total Released Credits Generated:	0
Available Advanced Credits:	30

Chippewa PSA (070500)							
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Starting Advanced Credits:	50								
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Total Advanced Credits Sold:	0								
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Total Released Credits Generated:	0								
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Available Advanced Credits:	50
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[illegible]

Upper Mississippi - Black Root PSA (070400)			

[illegible]

Total Advanced Credits Sold:	0							
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[illegible]

Available Advanced Credits:	50						
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[illegible]

**Upper Mississippi - Maquoketa Plum PSA (070600)**

Starting Advanced Credits: 30

Total Advanced Credits Sold: 0

Total Released Credits Generated: 0

Available Advanced Credits: 30

Bill of Sale #	Date of Sale	Credit Type (Advanced / Released)	Quantity of Advanced Credits Sold (nearest 0.01)	Quantity of Released Credits Sold (nearest 0.01)	Credit Revenue Received	Impact Quantity (nearest 0.01 acre)	Quantity of Required Comp. Mitigation Credits (nearest 0.01)	Corps Permit #	DNR Permit #	HUC-8 # of Impact	Wetland Classification of Impact	Released Credit Wetland Classification (NA if Advanced Cr)
TOTALS												
AVERAGES												

**Upper Wisconsin PSA (070700-U)**

Starting Advanced Credits: 100

Total Advanced Credits Sold: 0

Total Released Credits Generated: 0

Available Advanced Credits: 100

Bill of Sale #	Date of Sale	Credit Type (Advanced / Released)	Quantity of Advanced Credits Sold (nearest 0.01)	Quantity of Released Credits Sold (nearest 0.01)	Credit Revenue Received	Impact Quantity (nearest 0.01 acre)	Quantity of Required Comp. Mitigation Credits (nearest 0.01)	Corps Permit #	DNR Permit #	HUC-8 # of Impact	Wetland Classification of Impact	Released Credit Wetland Classification (NA if Advanced Cr)
TOTALS												
AVERAGES												

Lower Wisconsin PSA (070700-L)					
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Starting Advanced Credits:	40								
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Total Advanced Credits Sold:	0								
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[illegible]

<b>Available Advanced Credits:</b>	<b>40</b>								
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[illegible]

<b>Rock PSA (070900)</b>						
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[illegible][illegible][illegible][illegible][illegible]

## Northwestern Lake Michigan PSA (040301)

Starting Advanced Credits:	100							
Total Advanced Credits Sold:	0							
Total Released Credits Generated:	0							
Available Advanced Credits:	100							

[illegible][illegible]

Starting Advanced Credits:	55
Total Advanced Credits Sold:	0
Total Released Credits Generated:	0
Available Advanced Credits:	55

[illegible]

Southwestern Lake Michigan PSA (040301)	
-----------------------------------------	--

Starting Advanced Credits:	60								
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Total Advanced Credits Sold:	0								
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Total Released Credits Generated:	0								
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[illegible][illegible]

<b>Upper Illinois PSA (040400)</b>				
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[illegible][illegible][illegible][illegible][illegible]

## Exhibit C: Credit Liabilities and Mitigation Compliance

Credit Liabilities and Mitigation Compliance				
revised: DD/MM/YYYY				
PSA Name	Total Advanced Credit Liability	Total Released Credit Generation	Proposed Project Released Credits	Compliance Discrepancy
Lake Superior				0.00
St. Croix				0.00
Chippewa				0.00
UMBR				0.00
UMMP				0.00
Upper WI				0.00
Lower WI				0.00
Rock				0.00
NW Lake Mich				0.00
Fox				0.00
SW Lake Mich				0.00
Upper IL				0.00
<b>TOTALS</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>

## Exhibit D: Financial Ledgers

Credit Financial Account Summary							
Revised: DD/MM/YYYY							
PSA Name	Starting Balance	Credit Revenue	10% Contingency Expense	10% Admin Expense	Other Expense	Encumbered	Ending Balance
Lake Superior	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
St. Croix	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Chippewa	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
UMBR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
UMMP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Upper WI	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lower WI	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Rock	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
NW Lake Mich	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Fox	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SW Lake Mich	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Upper IL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTALS</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>AVERAGES</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

## Non-Credit Account Summary

Revised: DD/MM/YYYY

Starting Balance  
(Insert Date)

\$ -

Date	Activity Codes	Activity Description	Revenue	Expense	Encumbered	Ending Balance
		TOTALS				
		AVERAGES				

## Administrative Account Summary

Revised: DD/MM/YYYY

Starting Balance  
(Insert Date)

\$ -

Date	Activity Codes	Activity Description	Revenue	Expense	Encumbered	Ending Balance
		TOTALS				
		AVERAGES				

**Program Contingency Account Summary**

Revised: DD/MM/YYYY

Starting Balance  
(Insert Date)  
\$ -

Date	Activity Codes	Activity Description	Revenue	Expense	Encumbered	Ending Balance
		TOTALS				
		AVERAGES				

## Exhibit E: Project Credit Generation Tables

INSERT INDIVIDUAL PROJECT DESCRIPTION - EXAMPLE						
PSA Name:		Upper Mississippi-Black Root				
Total Potential Credits:		100				
Released No.	Date of Release	Milestone Description	# of Generated Credits	# of Remaining Credit Potential	% of Generated Credits	% of Remaining Credit Potential
1	03/01/2017	Upon approval of Mitigation Plan and recording of Warranty Deed/Conservation Easement	20	80	20%	80%
2	08/01/2017	Upon completion of construction & approval of as-built report	15	65	15%	65%
3	04/01/2018	Upon achievement of interim hydrology performance standard	10	55	10%	55%
4	11/01/2019	Upon achievement of vegetative cover performance standard	10	45	10%	45%
5	04/01/2020	Upon achievement of native species diversity	10	35	10%	35%
6	11/01/2022	Upon completion of final year of monitoring.	35	0	35%	0%
TOTAL GENERATED CREDITS			100			
# of Non-Achieved Credit Potential			0			
% of Non-Achieved Credit Potential			0%			

## Exhibit F: Credit Fee Schedule

### Completed Program Year 2014-2015

Primary Service Area	Credit Fee	Secondary Service Area
Lake Superior	\$58,000	Lake Superior Basin
St. Croix	\$60,000	Mississippi River Basin
Chippewa	\$60,000	Mississippi River Basin
Upper Mississippi – Black Root	\$60,000	Mississippi River Basin
Upper Wisconsin	\$60,000	Mississippi River Basin
Lower Wisconsin	\$60,000	Mississippi River Basin
Upper Mississippi – Maquoketa Plum	\$60,000	Mississippi River Basin
Rock	\$60,000	Mississippi River Basin
Upper Illinois	\$60,000	Mississippi River Basin
Northwestern Lake Michigan	\$61,000	Lake Michigan Basin
Fox	\$61,000	Lake Michigan Basin
Southwestern Lake Michigan	\$61,000	Lake Michigan Basin

### Proposed Program Year 2015-2016

Primary Service Area	Credit Fee	Secondary Service Area
Lake Superior	\$58,000	Lake Superior Basin
St. Croix	\$60,000	Mississippi River Basin
Chippewa	\$60,000	Mississippi River Basin
Upper Mississippi – Black Root	\$60,000	Mississippi River Basin
Upper Wisconsin	\$60,000	Mississippi River Basin
Lower Wisconsin	\$60,000	Mississippi River Basin
Upper Mississippi – Maquoketa Plum	\$60,000	Mississippi River Basin
Rock	\$60,000	Mississippi River Basin
Upper Illinois	\$60,000	Mississippi River Basin
Northwestern Lake Michigan	\$61,000	Lake Michigan Basin
Fox	\$61,000	Lake Michigan Basin
Southwestern Lake Michigan	\$61,000	Lake Michigan Basin

***Appendix D. – Request For Proposal (RPF) Outline***

# WI Wetland Conservation Trust

## REQUEST FOR PROPOSALS (RFP) OUTLINE

**Prepared on:**

September 15, 2014

**Prepared by:**

WWCT SPONSOR

Wisconsin Department of Natural Resources

141 NW Barstow St., Rm 180

Waukesha, WI 53188

**Contact:**

Matt Matrise

Wetland In-Lieu Fee Coordinator

[Matthew.Matrise@wisconsin.gov](mailto:Matthew.Matrise@wisconsin.gov)

(262) 574-2124

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## Introduction

The Wisconsin Wetland Conservation Trust (herein, “WWCT”) is an in-lieu fee mitigation program Sponsored and Administered by the Department of Natural Resources authorized by the U.S. Army Corps of Engineers. The purpose of the WWCT is to provide an additional method of compensatory mitigation to offset unavoidable adverse impacts to wetland resources focusing on the greatest watershed need. The overall objective of the WWCT is to complete compensatory wetland mitigation projects on the ground selected through a watershed approach. Through the sale of WWCT credits the Sponsor has accepted the legal responsibility to satisfy wetland compensatory mitigation requirements specified by US Army Corps of Engineers-St. Paul District permits authorized under Section 404 of the Clean Water Act, Section 10 of the River and Harbors Act and Wisconsin DNR Wetland Individual Permits pursuant to Chapter 281.36, Wis. Stats. Credit revenues are deposited into an account and separately tracked specific to each Primary Service Area for which they were accepted in response to where the impacts occurred. These funds are then utilized to build projects on the ground that restore, enhance, establish and preserve wetland resources to compensate for the loss of wetland functions according to a watershed approach. Through this Request For Proposals (herein, “RFP”) process public agencies, non-profit conservation organizations and private citizens may submit a project for funding consideration under a competitive process. Projects will be selected according to the corresponding Compensation Planning Framework of the WWCT Instrument that lists goals, objectives and a Prioritization Strategy for Site Selection and Planning.

## Proposal Submittals

In order for a submittal to be reviewed by the Sponsor they must be received no later than 5:00pm central on \_\_\_\_\_ (date). Project proposals may be submitted via email to [Matthew.Matrise@wisconsin.gov](mailto:Matthew.Matrise@wisconsin.gov), hand delivered and/or mailed to the Contact office identified on the cover page. All project proposals must contain the elements identified on Appendix B of this RFP, a project description and ideally the elements contained within Appendix A of this RFP. The total proposal shall not be larger than 12 pages of content and at a minimum shall contain the following elements:

- Project Description
- Land Ownership
- Goals and Objectives
- Baseline Information with maps
- Mitigation Method(s) proposed (i.e. restoration, enhancement, establishment, preservation)
- Project Budget
- Project Work Plan
- Perpetual Protection Mechanism
- Project Timeline
- Long Term Perpetual Stewardship

- Other Benefits

## Primary Service Area Compensation Planning Framework

This section shall describe the primary service area conditions in terms of historic losses, all threats, existing conditions and the general targeted projects sought for funding based on the goals and objectives.

## Proposal Review Process

Full project proposals received that meet the proposal submittal requirements will be screened through a four step process. The intent of this 4 pronged process is to whittle down the pool of projects with each step to reach the project that is best suited to attain improvements of wetland function within the announced service areas having appropriate project funding through the sale of Advanced Credits.

**First**, projects will be selected based on their ability to meet the core requirements listed below in order to determine those meeting initial pre-requisites.

**Second**, projects will be selected based on their capacity to provide one or more wetland functions and their ability to achieve the goals and objectives as stated under the service area and HUC-8 watershed levels.

**Third**, projects will be selected based on their location within or adjacent to areas mapped as Potential Restorable Wetlands or other priority conservation areas.

**Fourth**, projects will be prioritized if they are located within high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.

## Core Requirements

1. All mitigation site proposals must contain the ability to result in a successful and sustainable net gain and/or preservation of wetland function and/or wetland area.
2. All mitigation site proposals must fulfil the tenets of existing Advanced Watershed Plans (where applicable) and/or fulfil the tenets of the prioritization strategy for the corresponding PSA with preference being given to AWP's. Existing AWP's are defined as those plans that were reviewed and approved by the Sponsor and Corps and are listed in the CPF specific to each PSA.
3. Other Evaluation Criteria may include, but is not limited to :
  - Cost, feasibility, size, proximity to other conservation lands or protected areas, connectivity or location in respect to corridors, human use value, efficient long-term maintenance, location within approved WI Natural Resource Board Boundaries.

## Advanced Watershed Plans

List approved plans and their goals and objectives if applicable.

## Service Area Goals and Objectives

The following is an **EXAMPLE** taken from the **St. Croix Primary Service Area...**

The overarching goal of the WWCT Program is to attain improvement of wetland function on a watershed basis through restoring, establishing, enhancing and preserving wetland resources targeted within compatible areas to compensate the greatest need based on overall historic losses, permit impact trends and threats.

The Service area wetland resource goals and objectives are:

1. Provide compensatory mitigation in adequate quantity to satisfy the WWCT's legal responsibility taken on through the sales of Advanced Credits on a reoccurring basis.
2. Perform compensatory mitigation in high opportunity watershed areas demonstrated by having sustained high estimated percentage losses of historic wetlands and high quantity of mapped Potentially Restorable Wetlands.
3. Replace historic wetland types that have sustained the greatest estimated losses and any corresponding wetland types trending as under pressure from permitted actions in areas identified within or adjacent to mapped Potentially Restorable Wetland locations.
4. Implement priority conservation actions for Species of Greatest Conservation Need identified in the WI Wildlife Action Plan for each ecological landscape to restore, enhance, establish or preserve their associated wetland habitat.
5. Address and reduce sources of impairment in 303(d) listed resource drainages capable of remediation through wetland projects including, but not limited to erosion resulting in sediment/total suspended solids impairment.
6. Provide functional buffers around project areas to protect the site from adjacent adverse impacts, excessive nutrient and sediment inputs and invasive species in order to sustain wetland function.
7. Preserve rare and high quality wetlands; critical habitat for threatened and endangered species; significantly associated priority habitat for Species of Greatest Conservation Need; and other important areas identified on the WI Wildlife Action Plan, WI State Natural Areas Program, Natural Heritage Inventory or other scientific based selection methodology.
8. Restore, enhance, establish and/or preserve 15 acres of wetland resources through initiation of projects on the ground within 3 years after selling the first advanced credit. This goal is dependent upon the total amount of advanced credits sold since funding is required prior to undertaking a project and may be implemented on a reoccurring basis.

The HUC-8 watershed goals and objectives are:

### **Des Plaines River      HUC-07120004**

This watershed has lost approximately 59.71% of its overall historic wetlands, which is the highest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 17,577 acres of wetland loss, which is the highest for this service area. Permit trends do not specific the wetland type for the majority (52%) of permitted actions. Wet to Wet-Mesic Prairies and Floodplain Forests have

sustained the greatest estimated historic percentage losses at 72.02% and 67.30% respectively, followed by Sedge Meadows. A review of the estimated historic acreage loss quantities reinforces significant quantity losses across these categories. The overall land use within this watershed is overwhelmingly agriculture at 60.28%, followed by natural at 23.35% and developed at 16.37%. The agriculture areas are composed of mainly cultivated crops, while natural areas are comprised of deciduous forest, woody wetlands and grassland/herbaceous area. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Wooded Swamps and Floodplain Forests. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall forested/ grassland/herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows, Wooded Swamps (Hardwood or Coniferous), Floodplain Forests and Shrub Swamps (Shrub-Carr or Alder Thicket).
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Northern Sedge Meadow, Ephemeral Pond and Calcareous Fen.

#### **Upper Fox River      HUC-07120006**

This watershed has lost approximately 39.84% of its overall historic wetlands, which is the lowest for this service area. Mapped Potentially Restorable Wetland acres are high in this watershed presenting good opportunity for project development. Corps permitted actions over the past 5 years depicts 12.152 acres of wetland loss, which is moderate for this service area. Permit trends identify Deep and Shallow Marshes, Sedge Meadows, Fresh (Wet) Meadows, Wet to Wet-Mesic Prairies and Calcareous Fens as the wetland types under the greatest pressure from permitted actions. Wet to Wet-Mesic Prairies and Floodplain Forests have sustained the greatest estimated historic percentage losses at 57.39% and 47.31% respectively, followed by Sedge Meadows. A review of the estimated historic acreage loss quantities reinforces significant quantity losses across these categories. The overall land use within this watershed is mainly agriculture at 49.71%, followed by natural at 29.73% and developed at 20.56%. The agriculture areas are composed of overwhelmingly cultivated crops, while natural areas are comprised of deciduous forest, woody wetlands, open water and emergent herbaceous wetlands. Current mapped wetlands are dominated by Sedge Meadows, Fresh (Wet) Meadows, Calcareous Fens and Wet to Wet-Mesic Prairies, followed by Wooded Swamps, Floodplain Forests and Shrub Swamps. Therefore, replacing Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests will fit well within this watershed given the overall forested, emergent herbaceous vegetative setting and compatible mapped wetland community dominant types. Buffers and woody vegetation will be important in those local areas where invasives are present. Reconnecting valuable wildlife corridors that have suffered from fragmentation over time is also a major consideration. The WI Wildlife Action Plan also shows this general watershed area as an opportunity area for the management of the following rare wetlands: Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Ephemeral Pond and Calcareous Fen.

- Restore and enhance Sedge Meadows, Fresh (Wet) Meadows and Floodplain Forests.
- Preserve and enhance Southern Sedge Meadow, Floodplain Forest, Wet Prairie, Wet-Mesic Prairie, Southern Tamarack Swamps, Bog Relict, Ephemeral Pond and Calcareous Fen.

## How Project Meets or Exceeds Goals and Objectives

Projects must provide a narrative and supporting data indicating how the proposed project meets and or exceeds the above goals and objectives. A proposals ability to achieve more than one goal and objective will result in a high priority when the Sponsor reviews and compares all received complete proposals.

## Award Process

Full proposals that are reviewed by the Sponsor and selected based on their ability to meet or exceed the three step review criteria may be presented to the Interagency Review Team (herein, "IRT"), which makes the final determination on funding approval. The IRT, chaired by the U.S. Army Corps of Engineers, includes potential representatives from the Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, WI Department of Natural Resources. Successful applicants shall be required to enter into a contractual agreement with the Sponsor as well as complete perpetual land protection, such as the Conservation Easement contained in Appendix E.

## Project Considerations

The WWCT is a compensatory mitigation program that is required to function under applicable state and federal laws as well as approved legal agreement referred to as the Program Instrument. These requirements, which are detailed below result in several considerations an applicant should be aware of when submitting a proposal for funding approval.

**Perpetual Protection:** Proposals receiving funding approval will be required to protect the project site in perpetuity to ensure the sustainability of the wetland functions the project seeks to provide. Likewise, all funded projects must consist of a long term monitoring and maintenance plan that protects the wetland functions. Applicants are encouraged to seek partnerships with an entity having expertise with long term land stewardship to ensure the sites ecological sustainability.

**Potential Property Uses:** Current state law requires that any wetlands that benefit from the program shall be open to the public for hunting, fishing, trapping, cross-country skiing, or hiking or any combination thereof, but the Department may establish reasonable restrictions on the use of the land by the public in order to protect public safety or to protect a unique plant or animal community.

**Land Acquisition / Conservation Easements:** Projects that consist of easements as the means of perpetual site protection instead of the Sponsor acquiring the property through fee-simple title must prohibit any activities that might otherwise jeopardize the objectives of the compensatory mitigation project. The easement must also establish third party enforcement rights and access rights for the Sponsor and Corps. The Sponsor is also interested in projects that provide the Sponsor an opportunity to acquire the project property through fee-simple title subject to the purchase requirements of the WI Department of Natural Resources.

**Matching Funds:** In accordance with the 2008 federal Mitigation Rule [33 CFR 332.3(j)(2)], "...federally-funded aquatic resource restoration or conservation projects undertaken for purposes other than compensatory mitigation, such as the Wetlands Reserve Program, Conservation Reserve Program, and

Partners for Wildlife Program activities, cannot be used for the purpose of generating compensatory mitigation credits...”. Please ask in advance of submitting a proposals if you are unsure about the matching requirements and restrictions.

**Preservation Proposals:** While preservation projects may be funded through the WWCT program as a means to provide compensatory mitigation there are specific requirements that need to be met, which are detailed on the WWCT Program Instrument. Also, proposals consisting of only preservation may not be as competitive as those projects that may also include a restoration, enhancement or establishment component.

**Parcel Ownership:** All proposals must be generated from the owner of the subject parcel or otherwise land controlling entity. Proposals submitting for land not owned or otherwise controlled by the applicant shall not be considered for funding. Proof of ownership or land control shall be submitted along with a competitive proposal.

**Complete Mitigation Plan:** All funding applicant are strongly encouraged to read all elements contained within Appendix A – Mitigation Plan Template as selected proposals will be required to ultimately adhere to the elements of this document prior to submission for final funding approval from the IRT, although the Sponsor may provide assistance with this effort.

## **Appendix A – Mitigation Plan Template**

## **Appendix B – Project Budget Outline**

## **Appendix C – WWCT Anticipated Timeline**

## **Appendix D – Available Project Funds**

## **Appendix E – Conservation Easement Template**

## **Appendix F – Potentially Restorable Wetlands Maps per HUC-8**

### ***Appendix E. – WWCT Mitigation Plan Template***

The WWCT shall submit a Mitigation Plan to the Corps and IRT in order to pursue funding approval for a project. The submitted Mitigation Plan shall contain the elements referenced under the 2013 WI Mitigation Guidelines Appendix E. Compensation Site Plan (CSP) Outline.

***Appendix F. – Affidavit of Compensatory Mitigation Credit Purchase & Mitigation Summary Worksheet***

The Affidavit of Compensatory Mitigation Credit Purchase template attached herein depicts the verification form the Sponsor anticipates utilizing and providing to the regulatory agencies upon successful credit transactions. The Mitigation Summary Worksheet draft template depicts the anticipated form to be utilized by an applicant to communicate to the regulatory agencies their compensatory mitigation plan for satisfying the legal permit requirement to perform compensatory mitigation.

# AFFIDAVIT OF COMPENSATORY MITIGATION CREDIT PURCHASE

(Form Revised 9/2014)

CONTACT INFORMATION	APPLICANT	AUTHORIZED REPRESENTATIVE
Name (Last, First, Middle Initial)		
Title		
Organization / Entity		
Mailing Address		
City, State, Zip Code		
Email Address		
Phone Number (incl. Area Code)		
PROJECT INFORMATION		
Project Name		
Latitude---Longitude Coordinates		
Municipality Location (City, Village, Town)		
Township --- Range --- Section		
County Location		
Brief Description of Project:		

## MITIGATION CREDIT PURCHASE INFO – List each distinct Wetland Classification Credit Purchase on a separate row.

Credits Purchased (nearest 0.01)	Wetland Classification ( Per WI Mitigation Guidelines)	Service Area Name	Service Area #	Replacement Ratio (Credit : Impact)	TOTAL Credits Purchased

## PROJECT IMPACT INFO – List each distinct Wetland Classification Impact on a separate row.

Impact Acres (nearest 0.01)	Wetland Classification ( Per WI Mitigation Guidelines)	Service Area Name	Service Area #	Replacement Ratio (Credit : Impact)	Credits Required

## Permit Information

WI Department of Natural Resources Permit Docket #	U.S. Army Corps of Engineers Permit Docket #

## Applicant Certification:

Upon affixing my signature below, I hereby certify the completion of the above detailed credit purchase secured from \_\_\_\_\_, an authorized compensatory mitigation provider.

\_\_\_\_\_  
Applicant Signature

\_\_\_\_\_  
Date (DD/MM/YYYY)

## Compensatory Mitigation Provider Certification:

Upon affixing my signature below, I hereby certify the completion of the above detailed credit purchase, accept the responsibility to perform compensatory mitigation on behalf of the Applicant and have recorded the debit in my accounting system to adjust my available credits.

\_\_\_\_\_  
Provider Signature

\_\_\_\_\_  
Business or Program Name

\_\_\_\_\_  
Date (DD/MM/YYYY)

## Mitigation Summary Worksheet for Wetland Individual Permit

Form #####-### (Rev. 10/2014) Page 1 of 1

**Notice:** Pursuant to § 281.36, Wis. Stats., this Mitigation Summary Worksheet must be completed in its entirety and submitted to the Department of Natural Resources (DNR) prior to the required pre-application meeting set up by the DNR. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin Open Records law [§§ 19.31 – 19.39, Wis. Stats.]

This Mitigation Summary Sheet is required for Wisconsin Department of Natural Resources Wetland Individual Permit (IP) applications as wetland compensatory mitigation is required for all issued IP projects. The applicant, or authorized representative, shall complete all fields below and submit this Mitigation Summary Sheet along with their IP application in advance of the mandatory pre-application meeting. A final version of the Mitigation Summary Form shall then be re-submitted along with the final IP application following completion of the pre-application meeting reflecting any resulting alterations to the proposed project representing the final wetland compensatory mitigation details.

<input type="checkbox"/> Preliminary mitigation summary sheet	<input type="checkbox"/> Final mitigation summary sheet
---------------------------------------------------------------	---------------------------------------------------------

CONTACT INFORMATION	APPLICANT	AUTHORIZED REPRESENTATIVE
Name (Last, First, Middle Initial)		
Title		
Organization / Entity		
Mailing Address		
City, State, Zip Code		
Email Address		
Phone Number (incl. Area Code)		

PROJECT INFORMATION	
Project Name	
Latitude---Longitude Coordinates	
Municipality Location (City, Village, Town)	
Township --- Range --- Section	
County Location	

UNAVOIDABLE WETLAND IMPACT INFORMATION	
Service Area Name (insert link to map)	
Service Area HUC-6# (insert link to map)	
Impact 1 – Quantity of Proposed Wetland Impact (to nearest 0.01 Acres)	
Impact 1 - Impacted Wetland Classification (I.e. Per Mitigation Guidelines Types)	
Impact 2 – Quantity of Proposed Wetland Impact (to nearest 0.01 Acres)	
Impact 2 - Impacted Wetland Classification (I.e. Per Mitigation Guidelines Types)	
Impact 3 – Quantity of Proposed Wetland Impact (to nearest 0.01 Acres)	
Impact 3 - Impacted Wetland Classification (I.e. Per Mitigation Guidelines Types)	

CHECK SELECTION	PROPOSED COMPENSATORY MITIGATION	EXPLAIN WHY TYPE WAS CHOSEN / LIST CONTACTED PARTY	EXPLAIN WHETHER CREDITS ARE AVAILABLE
<input type="checkbox"/>	Credit Purchase: Mitigation Bank		
<input type="checkbox"/>	Credit Purchase: WI Wetland Conservation Trust (In-Lieu Fee)		
<input type="checkbox"/>	Permittee Responsible Mitigation		

***Appendix G. - Wetland Compensatory Mitigation Easement Template***

The subsequent template easement document as referenced within the Instrument is provided herein as a general reference to the type of legal mechanisms that may be employed to secure and protect project sites. Please note that this template document contains provisions relevant to sites being open to the public that may need to be altered to meet the requirements of the WWCT.

State of Wisconsin  
Department of Natural Resources  
Box 7921  
Madison, WI 53707

**WETLAND IN-LIEU FEE  
COMPENSATORY  
MITIGATION EASEMENT**  
Sec. 281.36(8m), Wis. Stats  
(effective 10-17-2014)

**THIS GRANT OF A CONSERVATION EASEMENT** is made by and between \_\_\_\_\_, (hereinafter referred to as the "Grantor"), and the State of Wisconsin Department of Natural Resources, (hereinafter referred to as "Grantee"), as a holder of a Conservation Easement pursuant to the provisions of s. 281.36(8m), Wis. Stats.

**RECITALS**

**WHEREAS**, the Grantors are the owners in fee title of certain real property located in the Town of \_\_\_\_\_, \_\_\_\_\_ County in the State of Wisconsin, more particularly described on the attached Exhibit A, (hereinafter referred to as the "Conservancy Area");

**WHEREAS**, the Grantors desire and intend that the natural elements and the ecological and aesthetic values of the Conservancy Area be maintained and improved in accordance with the terms and conditions of this Conservation Easement;

**WHEREAS**, the Grantors and Grantee both desire, intend and have the common purpose of conserving and preserving in perpetuity the Conservancy Area in a relatively natural condition by placing restrictions on the use of the Conservancy Area and by transferring from the Grantors to the Grantee, by the creation of a Conservation Easement on, over and across the Conservancy Area, affirmative rights to ensure the preservation of the natural elements and values of the Conservancy Area;

**WHEREAS**, the Grantors have received valuable consideration for the granting of this Conservation Easement.

**NOW THEREFORE**, the Grantors, for valuable consideration received, do hereby give, grant, bargain and convey to the Grantee, its successors and assigns, forever, a Conservation Easement in perpetuity over the Conservancy Area consisting of the following:

**I. PURPOSE OF THE EASEMENT**

The purpose of this easement is to ensure that a wetland compensatory mitigation site will not be destroyed or substantially degraded by any subsequent owner of or holder of interest in the property on which the compensatory mitigation wetland is located.

**II. RIGHTS OF THE GRANTEE**

1. The Grantee shall have the right to enforce by proceedings at law or in equity the terms and conditions of this Conservation Easement hereinafter set forth. The right shall include but not be limited to, the right to bring an action in any court of competent jurisdiction to enforce the terms of this Conservation Easement, to require the restoration or enhancement of this property, consistent with the Site Mitigation Plan, titled, "\_\_\_\_\_" and dated \_\_\_\_\_, and subsequent amendments thereto, if any, a copy of which is attached hereto and incorporated herein and marked as Exhibit B, (hereinafter referred to as the

Recording Area

Return: Department of Natural Resources  
Bureau of Facilities & Lands – LF/6  
P.O. Box 7921  
Madison, Wisconsin 53707

Parcel Identification Number (PIN): \_\_\_\_\_

“Site Mitigation Plan”) or to enjoin non-compliance by appropriate injunctive relief. The Grantee does not waive or forfeit the right to take action as may be necessary to ensure compliance with terms of this Conservation Easement by any prior failure to act. Nothing herein shall be construed to entitle the Grantee to institute any enforcement action against the Grantors for any changes to the Conservancy Area due to causes beyond the Grantors' control and without the Grantor's fault or negligence (such as changes caused by fire, flood, storm, civil or military authorities undertaking emergency action or unauthorized wrongful acts of third parties).

2. The Grantee, its contractors, agents and invitees, shall have the right to enter the Conservancy Area, in a reasonable manner and at reasonable times, for the purpose of inspecting the Conservancy Area to determine if the Grantors are complying with the terms and conditions of this Conservation Easement and the purposes of this grant, and further to observe, study, record and make scientific studies and educational observations.
3. The Grantee shall have the right to install, operate and maintain water control structures, consistent with the Site Mitigation Plan, for the purpose of protecting, re-establishing and enhancing wetlands and their functional values. This includes the right to transport construction materials to and from the site of any existing or proposed water control structure.
4. The Grantee shall have the right to establish or re-establish vegetation through seeding or plantings, consistent with the Site Mitigation Plan.
5. The Grantee shall have the right to manipulate vegetation, topography and hydrology on the Conservancy Area, consistent with the Site Mitigation Plan, through diking, pumping, water management, excavating, burning, cutting, pesticide application and other suitable methods for the purpose of protecting and enhancing wetlands and wetland vegetation.

### **III. COVENANTS OF THE GRANTOR**

1. There shall be no commercial or industrial activity undertaken or allowed within the Conservancy Area.
2. There shall be no buildings, dwellings, barns, roads, advertising signs, billboards or other structures not related to conservation of wetland-based recreation or education purposes built or placed in the Conservancy Area.
3. There shall be no dredging, filling, excavating, mining, drilling or removal of any topsoil, sand, gravel, rock, minerals or other materials within the Conservancy Area except in conjunction with authorized management activities consistent with the Site Mitigation Plan.
4. There shall be no dumping of trash, plant materials or compost, ashes, garbage or other unsightly or offensive material, especially including any hazardous or toxic waste within the Conservancy Area.
5. The hydrology of the Conservancy Area will not be altered in any way or by any means including pumping, draining, diking, impounding or diverting surface or ground water into or out of the Conservancy Area, unless consistent with the Site Mitigation Plan.
6. All agricultural uses are prohibited within the Conservancy Area (e.g. plowing, tilling, haying, cultivating, planting or other agricultural activities). This does not include native seed production activities, mowing, planting, or herbicide use conducted for the purpose of enhancing the ecological

functions and values of the Conservancy Area consistent with the Site Mitigation Plan. The Grantor shall not stock animals or allow the grazing of animals on the Conservancy.

7. The Grantors are responsible for compliance with all federal, state and local laws governing the control of noxious weeds within the Conservancy Area.
8. There shall be no operation of motorized vehicles or equipment within the Conservancy Area except in conjunction with activities in conformance with Sections II and III herein.

#### **IV. RESERVED RIGHTS**

1. This Conservation Easement does not authorize entry upon or use of the Conservancy Area by the general public.
2. The Grantors and their invitees may hunt and fish in the Conservancy Area so long as they comply with all federal, state and local game and fishery regulations.
3. Nothing herein shall be construed as limiting the right of the Grantors to sell, give or otherwise convey the Conservancy Area, or any portion or portions thereof, provided that the conveyance is subject to the terms of this Conservation Easement.

#### **V. GENERAL PROVISIONS**

1. This Conservation Easement shall run with and burden the Conservancy Area in perpetuity and shall bind the Grantors and their heirs, successors and assigns. This Conservation Easement is fully valid and enforceable by any assignee of the Grantee, whether assigned in whole or in part. Prior to any assignment being effective, the Grantor must approve the assignment in writing.
2. The Grantors agree to pay any and all real property taxes and assessments levied by competent authority on the Conservancy Area.
3. The Grantors agree that the terms, conditions, covenants and restrictions set forth in this instrument will be inserted in any subsequent conveyance of any interest in said property. The Grantors agree to notify the Grantee of any such conveyance in writing and by certified mail no later than thirty (30) days before the conveyance.
4. The Grantee may assign or transfer this Conservation Easement and the rights contained herein to any Federal or state agency or private conservation organization for management and enforcement.
5. As the Covenants of the Grantor (Covenants) contained in this Conservation Easement are also material terms of the WWCT In-Lieu Fee Program Instrument between the Department of the Army, U.S. Army Corps of Engineers (Corps) and the Grantor, the Corps shall also have the right to enforce the Covenants. This right of enforcement right shall include, but not be limited to, the right to bring an action in any court of competent jurisdiction to enforce the terms of these Covenants, to require the restoration of this property to its natural condition, or to enjoin any non-compliance with the Covenants against the Grantor and the Grantor's successors in interest. The Corps shall also have the right to enter the Conservancy Area, in a reasonable manner and at reasonable times, for the purpose of inspecting the Conservancy Area to determine compliance with the Covenants. The Grantor shall notify the Corps of any proposed conveyance of the Conservancy Area (or any portion of it) in writing and by certified mail no later than sixty (60) days before the conveyance. The enforcement of these Covenants by the Corps

shall be governed by federal law.

6. The terms "Grantors" and "Grantee" as used herein shall be deemed to include, respectively, the Grantors and their heirs, successors, personal representatives, executors and assigns, and the Grantee and its successors and assigns.
7. This Easement may not be modified, amended or terminated except by execution and recording of a written instrument signed by the Grantor, the Grantee and the Corps.
8. If any provision or specific application of this Easement is found to be invalid by a court of competent jurisdiction, the remaining provisions or specific applications of this Easement shall remain valid and binding.
9. This Easement shall be governed by and construed under the laws of the State of Wisconsin.

**IN WITNESS THEREOF** Grantor and Grantee have caused this instrument to be executed on their respective behalf effective this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
Grantor (SEAL)

\_\_\_\_\_  
Grantor (SEAL)

STATE OF WISCONSIN                    )  
                                                  ) ss.  
\_\_\_\_\_ COUNTY                        )

Personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, the above named \_\_\_\_\_  
\_\_\_\_\_ to me known to be the persons who executed the foregoing  
instrument and acknowledged the same.

\_\_\_\_\_  
\*  
Notary Public, State of Wisconsin  
My commission (expires) (is) \_\_\_\_\_

**ACCEPTED** this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

State of Wisconsin  
Department of Natural Resources  
For the Secretary

\_\_\_\_\_(SEAL)  
\*

STATE OF WISCONSIN                    )  
                                                  ) ss  
DANE COUNTY                            )

Personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_, 2011, the above  
named \_\_\_\_\_ to me known to be the person who executed the foregoing  
instrument and acknowledged the same.

\_\_\_\_\_  
\*  
Notary Public, State of Wisconsin  
My commission (expires) (is) \_\_\_\_\_

## CONSENT TO EASEMENT BY LIEN HOLDER

\_\_\_\_\_  
(name of person or institution)

being the owner and holder of a certain \_\_\_\_\_

(lien, mortgage, land contract, etc.)

which is \_\_\_\_\_

(insert recording data: doc.#, volume, page, etc.)

against said Premises, does hereby join in and consent to said conveyance free of said lien.

IN WITNESS THEREOF, the hands and seals of any person joining in and consenting to this conveyance on the day and year first written.

\_\_\_\_\_ (SEAL)

\_\_\_\_\_ (SEAL)

STATE OF \_\_\_\_\_ )  
 ) ss.  
\_\_\_\_\_ COUNTY )

Personally appeared before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, the above named \_\_\_\_\_ to me known to be the person(s) who executed the foregoing instrument and acknowledged the same.

\_\_\_\_\_  
\*

Notary Public, State of Wisconsin

My commission (expires) (is) \_\_\_\_\_

This instrument drafted by:  
State of Wisconsin  
Department of Natural Resources

EXHIBIT A  
LEGAL DESCRIPTION

**EXHIBIT B**  
**SITE MITIGATION PLAN**