# WETLAND RESTORATION AND PRESERVATION PLAN

## For Lake County, Illinois

## VOLUME 2: APPENDICES

ADOPTED
MONTH 2020

LAKE COUNTY
STORMWATER MANAGEMENT COMMISSION

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# WETLAND RESTORATION AND PRESERVATION PLAN

## FOR LAKE COUNTY, ILLINOIS

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Adopted: Month 2020

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# APPENDIX A

## *GIS PROCESSES*

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# APPENDIX A.1

## LCWI ENHANCEMENT

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# APPENDIX A.1 LCWI ENHANCEMENT

## INTRODUCTION

The Lake County Wetlands Inventory (LCWI), as originally developed by a Federal Wetlands Committee in 1991, is a mapping product maintained by the Lake County (Illinois) GIS Division (LCGIS) for use by the public and private sector. As a large component of the Lake County Stormwater Management Commission's (SMC) Wetland Restoration and Preservation Plan (WRAPP) entailed classifying and assessing existing wetlands, the LCWI served as the foundation dataset. However, to provide the most accurate and precise data possible, SMC tweaked and enhance the LCWI database to create a working dataset called the "Existing Wetland Inventory-Lake County (EWI-LC)." Although SMC used the EWI-LC to perform desktop GIS analyses for the WRAPP process, it does not replace the current LCWI geodatabase.

To create the LCWI-LC, SMC adjusted polygon geometry to account for changes in mapped wetland areas since the most recent publication of the LCWI and to allow for the evaluation of both water bodies and wetlands, as preferred by the Technical Advisory Group (TAG) (LCGIS 2009). We added polygon attributes to provide identifiers and keys for greater ease in performing the analyses for the WRAPP. Comparatively, the LCWI database has fewer than 20 attribute fields, whereas the "master" EWI-LC database contains well over 200 attribute fields.

The following list describes the steps taken, in order, to modify the LCWI and create the EWI-LC. To allow for potential changes to the desktop analysis methods, this appendix and the information included herein should be considered a "living" document and updated as needed.

## EWI-LC DEVELOPMENT PROCESS STEPS

SMC staff used the following steps to refine the LCWI into the EWI-LC.

1) SMC obtained a copy of the current LCWI geodatabase and metadata from LCGIS. SMC created a "working copy" that we duplicated and modified, preserving the current version of the LCWI as maintained by LCGIS.

2) SMC determined which LCWI polygons are likely to currently exhibit wetland functions. The attribute field "TYPE2002" describes the wetland type at the time of the last update to the LCWI (2002). **Attachment A.1-1** provides the various attribute field descriptions. The SMC project team determined that "TYPE2002" attributes "UC" (urban converted) and "NW" (non-wetland) polygons should be removed from the polygon layer for consideration of <u>current</u> wetland functions.

3) We selected and exported LCWI polygons with the TYPE2002 attributes of "W" (wetland), "FW" (farmed wetland), "FW*" (farmed wetland, crops under stress), "PFW" (potential farmed wetland), "PC" (prior converted wetland, converted prior to December 23, 1985), "CW" (converted wetland, converted after December 23, 1985), and "AW" (artificial wetland) into a new "working" geodatabase.

4) SMC intersected the "working" data polygons and the Lake County planimetric data showing building footprints and edge of road pavement (2011). We then flagged and extracted "working" polygons that intersected building footprints and road pavement areas for review.

5) SMC spot-checked the flagged building/pavement "working" polygons, as building or road construction likely resulted in wetland impacts extending beyond the mapped building or road footprint. Using the Clip tool, we removed portions of polygons

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that intersected building and pavement footprints from consideration for classification and assessment as those areas do not currently exhibit wetland functions. We then converted the resulting multi-part features to single-part features using the "Explode multi-part features" tool.

6) SMC revised polygon boundaries to map current wetland areas. In areas where obvious development in mapped LCWI polygons occurred after 2002 (such as the construction of a building), we consulted several years of aerial photography (2002-2014) as well as topographic data developed from 2007 LiDAR to determine the extent of wetland impacts. In some cases, aerial photography captured the development in process, in which case the wetland boundary, buffer and limits of disturbance are clearly indicated by silt and construction fencing on the site. We then deleted polygons that did not contain current wetland areas (such as polygons in building and pavement areas that were not identified in steps #4 and #5, above).

7) SMC staff selected numerous locations identified through steps 3-6 (above), some of which were predicted to contain wetland resources and some of which were predicted to have no wetlands present. Staff then field-verified the selected sites to determine the accuracy of the process described in steps 3-6, which was enough to continue with the remaining steps below.

8) We added the revised polygons back into the "working" data. This represents the initial iteration of the EWI-LC for "existing" mapped wetland areas.

9) The need to address both open "water bodies" and wetlands required us to delimit open water polygons (lakes, river, streams, and ponds) separately from "wetlands" (though ultimately, we classified about 500 polygons as open water "wetlands"). SMC used breaklines for water bodies generated for Lake County's 2007 LiDAR dataset to delimit the open water of "water bodies" from vegetated "wetland" and non-wetland areas for lakes, ponds, rivers and large streams (LCGIS 2010). For streams represented by a single breakline, SMC used a buffer of 3.33 feet on either side of the breakline to estimate the active stream channel. This is based on a comparison of single-line breaklines with aerial photography and a digital terrain model based on the 2007 LiDAR at selected locations and was deemed a conservative estimate of channel width. We then removed these buffered breaklines from the "wetland" polygon dataset and added the buffered breaklines to the "water body" dataset. We identified polygons initially listed as "water bodies" with a "WB" attribute while we identified the remaining polygons with a "WL" attribute.

10) SMC visually screened all EWI-LC polygons according to major watershed and township-range-section number. This step allowed us to confirm certain components of the National Wetland Inventory and hydrogeomorphic classifications assigned (see **Appendices A.3** and **A.4**), as well as to further enhance polygon boundaries. Polygon boundary enhancement was done via manual linework using the array of aerial photographs available, 2007 LiDAR-derived topographic information including a digital terrain model and cartographic contours, the Lake County soil survey, National Wetland Inventory, Lake County ADID study, site-specific wetland delineation reports, and the other data sources identified in **Section 4.2** of the WRAPP technical report.

11) As identified in Step 10, SMC added the National Wetland Inventory ("Cowardin") classification (Cowardin et al. 1979) and hydrogeomorphic classifications ("Landscape Position, Landform, Water Flow Path, and Waterbody Type" after Tiner 2011) to the attribute fields for each polygon record during the visual screening process. See **Appendices A.3** and **A.4** for details on classification.

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12) Following the field site checks (**Appendices B.1-B.4**), SMC revised the geodatabase based on field-verification of boundaries or wetland presence/absence.

13) SMC's final step was to develop functional ratings for each polygon (both "wetland" and "water body" polygons). **Appendix A.5** describes this process in detail. To do this, we added satisfaction criterion (Yes/No) and overall functional significance rating (High, Moderate, Low, or Not Applicable) as attribute fields in the record for each polygon.

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# ATTACHMENT A.1-1. LCWI 2002 ATTRIBUTE DESCRIPTIONS

## 2002 LCWI Attributes

***NOTE: The easiest way to view "WETLANDS" is to select 'W' in the CODE attribute.

AREA: Area of polygon feature, in sq. ft. (US)

PERIMETER: Perimeter of feature, units US feet

ACREAGE: Area of polygon feature, in acres

TYPE2002: Wetland type code
- 'AW' *ARTIFICIAL WETLANDS* - Man-made water bodies on non-hydric soil.
- 'CW' *CONVERTED WETLANDS* (ceased to be a wetland after 12/23/85) - Areas that have been drained or filled and no longer exhibit Wetland or Farmed Wetland characteristics.
- 'FW' *FARMED WETLANDS* - Agricultural cropped areas on hydric soil that have been cleared, partially drained or filled.
- 'FW*' *FARMED WETLANDS* - Crops Under Stress - Agricultural cropped areas on hydric soil that have been cleared, partially drained or filled.
- 'NW' *NON-WETLANDS* - Upland areas within wetlands.
- 'PC' PRIOR CONVERTED WETLANDS (ceased to be a wetland before 12/23/85) - Areas that have been drained or filled and no longer exhibit Wetland or Farmed Wetland characteristics.
- 'PFW' *POTENTIAL FARMED WETLANDS* - Agricultural cropped areas on hydric soil that have been cleared, partially drained or filled. These areas have not been verified by the NRCS; review of slides required.
- 'UC' *URBAN CONVERTED WETLANDS* (ceased to be a wetland, non-agricultural conversion) - Areas that have been drained or filled and no longer exhibit Wetland or Farmed Wetland characteristics.
- 'W' *WETLANDS* - Areas with a high potential for exhibiting hydric soil, hydrophytic vegetation and/or required hydrologic conditions.

NEWID: Unique ID - Manually assigned, derived from township + range + section + sequential number

HYDRIC_ACR: Sum of total HYDRIC soil within wetland polygon, in acres

HYD2004: Indicator of HYDRIC soil
- 'N' Non-hydric soil
- 'S' Soil symbol indicating a potential hydric soil condition, but area is too small to map Referenced from the "SOIL SURVEY LAKE COUNTY, ILLINOIS" 1970 publication USDA-SCS
- 'Y' Hydric soil

HIC2004: Indicator of HYDRIC INCLUSION soils
- 'N' Not a hydric-inclusion soil
- 'Y' Hydric-inclusion soil

HYD1970: Indicator of HYDRIC soil
- 'N' Non-hydric soil
- 'Y' Hydric soil

HIC1970: Indicator of HYDRIC INCLUSION soils
- 'N' Not a hydric-inclusion soil
- 'Y' Hydric-inclusion soil

CODE: Simple wetland code derived from TYPE2002 attribute
- 'C' Converted wetland - Areas that have been drained or filled and no longer exhibit wetland or farmed wetland characteristics
- 'NW' Non-wetlands - Upland areas within wetlands
- 'W' Wetland - Areas with a high potential for exhibiting hydric soil, hydrophytic vegetation, and/or required hydrologic conditions. This includes agricultural cropped areas.

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# APPENDIX A.2

## PRESETTLEMENT WETLAND MAPPING

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# APPENDIX A.2 PRESETTLEMENT WETLAND MAPPING

## INTRODUCTION

The Lake County Stormwater Management Commission (SMC) developed a Historic or "Pre-settlement" Wetlands Inventory (HWI-LC) for their Wetland Restoration and Preservation Plan (WRAPP) for Lake County, Illinois. In this appendix, we describe the process used to identify former wetland areas and classify those areas using existing wetland classification systems. SMC executed the assessment using GIS analysis, supported and informed by historical data. The HWI-LC is an "interim" product within the WRAPP development process, as we primarily used it to estimate wetland/water body loss/gain relative to the present and to provide a geographic base from which to identify potentially restorable wetland areas (PRWs).

For the WRAPP, we use the terms "historic" and "pre-settlement" as generally synonymous. Any mapped wetlands or likely indicators of wetland conditions (e.g., hydric soils) are, by nature, historic (i.e., they are mapped). We presume the extent of such historic features corresponds closely to the extent of the same prior to European settlement of Lake County.

SMC developed the HWI-LC largely from two sources: 1) the Lake County Wetlands Inventory (LCWI), a dataset developed by the Federal Wetlands Committee and maintained by the Lake County GIS Division; and 2) the Lake County Soil Survey, a dataset developed by the Natural Resources Conservation Service (NRCS) and augmented by numerous sources of additional historic data (LCGIS 2009, NRCS 2005). Being founded on these two sources, the HWI-LC does not contain "Landscape Position, Landform, Water Flow Path, and Waterbody Type" (LLWW) hydrogeomorphic wetland classification or National Wetland Inventory (NWI) "Cowardin" classification attribute data or descriptors (Tiner 2011, Cowardin et al. 1979).

We assigned LLWW and NWI descriptors to the HWI-LC polygons to estimate historic wetland functions. We based our process on methods outlined in previous watershed plans developed by SMC and on similar assessments of wetland function from the Midwestern and Eastern United States, including a pilot study in Lake County, Illinois (e.g., MDEQ 2011, PGE 2014, and Tetra Tech 2015). We assigned the descriptors for hydrogeomorphic and NWI classification and preliminary assessment of wetland function based on the U.S. Fish and Wildlife Service's (USFWS) "Dichotomous Keys and Mapping Codes for Wetland Landscape Position, Landform, Water Flow Path and Waterbody Type Descriptors: Version 2.0" (Tiner 2011) and "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al. 1979).

## IDENTIFICATION OF HISTORIC/PRE-SETTLEMENT WETLANDS

The following steps describe the process by which SMC identified and assigned LLWW and NWI descriptors for the HWI-LC polygons.

1) LCWI (2002) polygons of "TYPE2002" that SMC included in the initial "working" database were as follows: CW, FW, FW*, PC, PFW, UC, and W. These represent existing or converted "naturally-occurring" wetlands (See **Appendix A.1**, Attachment 1).

2) LCWI polygons of "TYPE2002" that SMC removed from the initial "working" database were AW and NW. These polygons

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represent anthropogenic wetlands created on upland soils after European settlement or non-wetland areas (See **Appendix A.1**, Attachment 1).

3) SMC added map unit polygons identified in the 2004 Lake County Soil Survey as "hydric" to the initial "working" database. This GIS layer is an updated version of the 1970 Lake County Soil Survey and was digitally produced (NRCS 2005, Paschke and Alexander 1970). However, this layer reflects the present soil conditions of 2005; therefore, areas where hydric soils have been historically altered or disturbed are not mapped as hydric. The combination of 2005 hydric soils and the wetland polygons identified in Step 1 (above) comprised SMC's initial "working" polygon layer for the HWI-LC. We used the following steps for additional refinements, additions, and quality checks of this initial working layer.

4) SMC visually screened all HWI-LC polygons according to major watershed and township-range-section number to confirm certain components of the NWI ("Cowardin") and hydrogeomorphic (LLWW) classifications assigned (see **Appendices A.3** and **A.4**), as well as further enhance the polygon boundaries. We did polygon boundary enhancements via manual linework using the sources identified in Steps 5 through 9 below.

5) We then compared soil map units identified in the 1970 Lake County Soil Survey (Paschke and Alexander 1970) as "hydric" to the HWI-LC working layer. Because this GIS layer was digitized from paper soil quad maps, there are minor inconsistencies with 2005 soil map unit boundaries when viewed at high resolutions. However, this layer best represents hydric soil distribution prior to 1970. We evaluated only mapped hydric soils from the 1970 survey that did not intersect with existing wetlands identified in item 1 (above) or hydric soils mapped in the 2005 soil survey. Where the 1970 survey indicated a potential historic wetland area, we consulted additional data, as outlined below, and decided whether to include the polygon, include a modified version of the polygon, or exclude the polygon. Hydric soil map units identified in this dataset are one source of information that we used to confirm the presence of wetland features not initially identified in Steps 1 through 3.

6) Federal Township Plats for Lake County dating from the 1840s have been digitized and georeferenced (LCGIS 2003). These maps provide some of the oldest available land cover information available on a County-wide scale. Because smaller wetland areas were often not mapped, these maps served as an initial check of the HWI-LC working layer, primarily to determine if a significant wetland area that existed in the 19th Century was omitted from the HWI-LC.

7) USGS 15-minute topographic quadrangles for Lake County dating from the early 20th Century and 7.5-minute quadrangles from the mid-20th Century have been digitized and georeferenced. These maps specifically indicate the location of wetlands but also reflect wetland changes associated with the development of agriculture in Lake County (such as the construction of ditches). Specifically, SMC used wetlands and water features identified in this dataset as one source of information to confirm the presence of wetland features not initially identified in Steps 1through 3.

8) Aerial photographs from 1939 and 1946 (and numerous subsequent years, see **Table A.2.1**) for Lake County have been orthorectified and georeferenced. The 1939 and 1946 sets constitute the earliest remote sensing data available for Lake County, and wetland signatures are evident even in areas under agricultural production. SMC used wetlands, water features, and other strong hydrologic signatures identified in this dataset as one source of information to confirm the presence of wetland features not initially identified in Steps 1 through 3.

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**Table A.2.1. GIS Data Sources Used for the HWI-LC.**

| Data Source | Source Date(s) |
|---|---|
| Georectified Aerial Photography | 1939, 1946, 1961, 1974, 1980, 1993, 1997, 2000, 2002 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2014, 2015 |
| Digital Terrain Model (DTM) (LiDAR-derived) | 2007 |
| Digitized Federal Township Plats | 1840 |
| Digitized Field Tiles | 2001 |
| Digitized Historic County Atlases | 1861, 1885 |
| Lake County Pre-Settlement (GLO) Vegetation (Bowles and McBride, 2005) | 1832-1840, 2005 |
| Lake County Pre-Settlement (GLO) Vegetation, augmented with soils data (Westerman not dated) | 1832-1840, 1970, 2006 |
| Lake County Drainage Tile | Varies, updated 2017 |
| Lake County Topography, 1-foot contours from 2007 LiDAR | 2007 |
| Lake County Wetland Inventory (LCWI) | 2002/2009 |
| SCS/NRCS Soil Surveys of Lake County | 1970, 2005 |
| SMC Watersheds & Sub-Watersheds | 1986-2017 |
| USFWS National Wetlands Inventory (NWI) Maps, digital | 1996 |
| USGS Topographic Quadrangle Maps (Historic) | 1908-1960 |

9) SMC consulted the 1915 Lake County Soil Survey (Hopkins et al. 1915) and, due to the broad scale of the soil mapping, used this resource in similar fashion to the Federal Township Plats (Step 5) and USGS 15-minute quadrangles (Step 6) to identify the general location of potential historic wetlands.

10) SMC used additional sources of historical, hydrological, wetland, and soils data as references by which we could estimate the presence or absence of historic wetland resources. **Table A.2.1** summarizes these datasets. We used features identified in any one of these data as one source of information to confirm the presence of wetland features not initially identified in Steps 1 through 3.

In Steps 5 through 10, SMC proceeded to collectively (not singly) assess whether polygons should be expanded, contracted, added, or deleted from the HWI-LC working layer For example, an area mapped as wetland on the USGS quadrangle series may not be mapped as hydric soil in the 1970 or 2005 soil survey. However, if the 1939 or 1946 aerial photography indicate a strong hydrologic signature visible on the land surface, we included that area in the HWI-LC. Likewise, if a potential wetland signature is apparent on an aerial photograph but none of the other historical geographic data sources support the presence of wetlands, we did not include that area in the HWI-LC. We wish to emphasize that the HWI-LC constitutes an *estimate* of historic wetland areas in Lake County rather than the exact size, shape, and limits of wetlands at a given point in the past. This data layer is intended to provide a basis for estimating historic wetland functions and locations of potentially restorable wetlands in Lake County.

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# APPENDIX A.3

## NWI CLASSIFICATION CODING

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# APPENDIX A.3 NWI CLASSIFICATION CODING

## INTRODUCTION

The Lake County Stormwater Management Commission (SMC) developed three geographic databases to provide the most accurate and precise data possible for the Wetland Restoration and Preservation Plan (WRAPP) for Lake County, Illinois. Using geodatabases, maps, and additional information sources that were currently available (see **Appendices A.1** and **A.2**), SMC created the Existing Wetland Inventory (EWI-LC), the Historic Wetland Inventory (HWI-LC) and the Potentially Restorable Wetland (PRW) inventory. These three WRAPP databases are founded on the Lake County Wetlands Inventory (LCWI), a dataset developed by the Federal Wetlands Committee and maintained by the Lake County GIS Division. The LCWI does not contain any National Wetlands Inventory (NWI) classification ("Cowardin Classification") attribute data. However, to confirm some hydrogeomorphic classifications and ultimately perform the assessment of wetland functions, the WRAPP polygons needed NWI classification attributes. The process by which SMC assigned NWI classifications to polygon attributes varied from one WRAPP data set to another. This appendix describes that process for each data set in detail but may refer to a previous section when the process or information used was identical.

In general, we constructed and classified the EWI-LC dataset first and used it as the baseline for the HWI-LC, which we constructed second, and the PRW database, which was the third and final inventory we constructed. The process of attributing the NWI classifications is described in that order below. This appendix does not include (except where clarification is necessary) descriptions, schematics, or definitions of all the NWI classification codes.

We used the *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC 2013) as our primary reference for the steps described below, augmented by *Mapping Conventions Northeastern Illinois* (USFWS 1985). SMC reviewed the existing NWI map and geographic data for Lake County in early 2015. That version of the NWI is the predecessor to "Version 2," which was published in May 2016. Therefore, some discrepancies are inherent between the mapping conventions that appeared in the NWI data when development of the WRAPP commenced and the current "Version 2" that is published by the U.S. Fish & Wildlife Service. Our project team tried to be consistent with the mapping conventions, both written and apparent in the geographic data, established by the NWI; however, we made changes when our team felt that more recent or additional data indicated a strong case for different or new classifications.

Importantly, we do not intend the WRAPP data sets to replace or update the LCWI or NWI data, in any version, for Lake County, Illinois.

## EWI-LC CLASSIFICATION

The following steps describe the process by which SMC assigned NWI classification codes to the EWI-LC polygons. Steps 11 through 29 typically proceeded concurrently during the during the polygon screening process described in **Appendix A.1**, Steps 1 through 10.

1) SMC reviewed the NWI data for Lake County to examine apparent mapping conventions employed at the time they were created. This revealed that that there were no "emergent" (EM) wetlands in the "lacustrine" (L) or "riverine" (R) systems; EM wetlands only occurred in "palustrine" (P) systems. Further, all mapped lacustrine (L) and riverine (R) polygons corresponded to open water areas of lakes, rivers and streams.

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2) SMC geospatially selected water bodies (lakes, rivers and ponds) identified with the "WB" attribute (see **Appendix A.1**, Step 9) in the EWI-LC based on overlap or proximity to polygons identified as belonging to the lacustrine (L) and riverine (R) systems in the NWI.
3) EWI-LC water bodies that corresponded with polygons classified as riverine (R) in the NWI received that same classification within the EWI-LC.
4) SMC gave further scrutiny to the EWI-LC water bodies that corresponded with polygons classified as lacustrine (L) in the NWI. Because the lacustrine system is divided into limnetic (L1) and littoral (L2) subsystems based on depth (FGDC 2013), SMC consulted sonar/GPS-derived bathymetric data for lakes developed by the Lake County Health Department. The current NWI classification standard (FGDC 2013) distinguishes the two subsystems based on a depth of 2.5 meters (~8.2 feet) while the original version (Cowardin et al. 1979) used a depth of 2 meters (~6.6 feet). Where possible, we used the 8-foot bathymetric contour to delimit the limnetic subsystem. If the 8-foot contour was not mapped, we used the next closest contour (shallower given preference) to delimit the limnetic subsystem. SMC performed this action for all lakes with bathymetric data indicating a depth of 8 feet or greater, regardless of the original NWI mapping. For lakes with no contours available and for which the NWI map indicated both limnetic (L1) and littoral (L2) subsystems, we imposed the original linework from the NWI on the EWI-LC. SMC assigned to all other lakes either the original NWI classification or an L1 or L2 classification based on the best available data (usually a Lake County Health Department detailed lake report).
5) SMC assigned lakes the Unconsolidated Bottom (UB) class except when the original NWI classification indicated an alternate class designation (e.g., AB or AB4). Likewise, we assigned all lakes a Permanently Flooded (H) water regime modifier unless otherwise indicated in the original NWI mapping for Lake County. SMC assigned special modifiers based on the original NWI mapping and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and11 and **Appendix A.2,** Steps 4 through 10.
6) We assigned all polygons identified as "rivers" under the "Landscape Position, Landform, Water Flow Path, and Waterbody Type" (LLWW) classification scheme (Tiner 2011) to the Lower Perennial subsystem (R2). We universally assigned the Unconsolidated Bottom (UB) class based on the original NWI classification conventions. SMC assigned special modifiers based on the original NWI mapping and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2,** Steps 4 through 10.
7) SMC reassigned portions of some lakes and the Fox River with the Aquatic Bed (AB) modifier based on American lotus (*Nelumbo lutea*) bed mapping by the Lake County Health Department (LCHD 2016).
8) SMC initially classified all polygons identified as "streams" under the LLWW classification scheme (Tiner 2011) as belonging to the Riverine (R) system. However, we reassigned those symbolized as polygonal or perennial linear features on the USGS topographic quadrangles or known to be perennial or likely perennial based on additional information available to the SMC to the Lower Perennial subsystem (R2). SMC universally assigned the Unconsolidated Bottom (UB) class and Permanently Flooded (H) water regime modifiers based on the original NWI classification convention for Lake County. We assigned special modifiers based on the original NWI mapping and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.
9) We classified all remaining polygons identified as "streams" under the LLWW classification scheme (Tiner 2011) as belonging to the Riverine (R) system and assigned to the Intermittent (R4) subsystem. Based on the NWI coding conventions, this

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subsystem is limited to the Streambed (SB) class. SMC assigned water regime modifiers as Seasonally Flooded (C) for intermittent streams or Temporarily Flooded (A) for ephemeral streams based on review of available data and additional information available to the SMC. We assigned special modifiers based on the original NWI mapping and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

10) SMC assigned remaining polygons to the Palustrine (P) system, following the original NWI mapping conventions for Lake County.

### *Assignment of NWI Classes*

11) SMC applied the Unconsolidated Bottom class (UB) to open water polygons (both wetland and water body) and mixed-class polygons with a significant open water component and no evidence of a dense aquatic bed. We based our assignment on the original NWI mapping and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and11 and **Appendix A.2**, Steps 4 through 10. We acknowledge this likely results in a conservative estimate of the aquatic bed (AB) and emergent, non-persistent (EM) classes among open water polygons.
12) We assigned the Aquatic Bed (AB) class and the rooted and floating vascular subclasses (AB3 and AB4, respectively) to open water polygons (both wetland and water body) and mixed-class polygons with a significant open water component. We based assignment to this class primarily on the original NWI mapping for Lake County and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.
13) SMC staff assigned the Rock Bottom (RB) and Rocky Shore (RS) classes to a limited number of polygons (<10). The Rock Bottom class applies only to the Palustrine system while Rocky Shore applies to both Lacustrine (L) and Riverine (R) systems. We based assignment to these classes primarily on observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11.
14) SMC assigned the Unconsolidated Shore (US) class and sand subclass (US2) to wetland polygons largely representing beaches or severely eroded shorelines. We assigned all Unconsolidated Shore, sand designations to beaches along lakes (L2US2). All other Unconsolidated Shore designations were assigned to the Riverine or Lacustrine systems. We assigned all polygons in the Unconsolidated Shore (US) class the Intermittently Flooded water regime modifier (J) based on the mapping convention of the original NWI for Lake County. We primarily based classification of these polygons on the original NWI mapping for Lake County and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 and 10.
15) Because only one of more than 3,500 polygons in a pure or mixed emergent (EM) class in the original NWI mapping for Lake County received a numeric subclass modifier, SMC did not attribute numeric subclass modifiers for the emergent (EM) class in the WRAPP data sets (NWI "Version 2" includes these attributions). We designated the emergent class both wetland and water body polygons, and with one exception, applied it only to the Palustrine (P) system. SMC assigned the emergent (EM) class based primarily on the original NWI mapping for Lake County and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.
16) SMC applied the Forested (FO) class and the Broad-Leaved Deciduous (FO1), Needle-Leaved Deciduous (FO2), Needle-Leaved Evergreen (FO4) and Dead (FO5) subclasses to wetland polygons, with four exceptions (a beaver pond and three detention ponds). All polygons in the Forested class belong to the Palustrine system. Most polygons (>99%) of the

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Forested class we designated Broad-Leaved Deciduous. The Broad-Leaved Evergreen subclass applied specifically to four relict bog forests. We assigned the Forested class based primarily on the original NWI mapping for Lake County and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and11 and **Appendix A.2**, Steps 4 through 10. Several areas identified as a class other than forested in the original NWI mapping have undergone afforestation or reforestation since the original NWI mapping.

17) We assigned the Scrub-Shrub (SS) class to wetland and water body polygons in the Palustrine system. All Scrub-Shrub polygons belong to the Broad-Leaved Deciduous (SS1) subclass. SMC assigned the Scrub-Shrub class based primarily on the original NWI mapping for Lake County and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and11 and **Appendix A.2**, Steps 4 through 10.

### *Assignment of Water Regime Modifiers*

18) SMC assigned Water Regime modifiers as described above, based on original NWI mapping for Lake County, observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11, observations during field site visits, and according to the descriptions in Steps 19 through 28, below.
19) We applied the Temporarily Flooded (A) water regime modifier to wetland polygons, ephemeral streams and ditches, and detention basins. Typically, we determined the designation by location on a floodplain, absence of surface water in numerous years of aerial photos, apparent ditching or drainage, soil type and original NWI mapping.
20) SMC applied the Seasonally Saturated (B) water regime modifier to wetland polygons in the Emergent, Forested, and Scrub-Shrub classes of the Palustrine system, primarily to polygons denoting seeps and bogs.
21) The Seasonally Flooded (C) water regime modifier is the most common, and SMC applied it to wetlands, intermittent streams and ditches and detention basins. We assigned Seasonally Flooded polygons to the Emergent, Forested, Scrub-Shrub, and Streambed classes. We typically determined the designation based on vegetation apparent in aerial photos, surface water apparent in some to many years of aerial photos, location in the landscape, soil types, and original NWI mapping.
22) SMC applied the Continuously Saturated (D) water regime modifier to a limited number of wetland polygons in the Palustrine system, as that modifier largely relates to seeps, bogs, and fens.
23) SMC applied the Seasonally Flooded/Saturated (E) water regime modifier to a single polygon based on observations during field site visits. This modifier is unconventional, not having been used in the original NWI mapping for Lake County.
24) We applied the Semipermanently Flooded (F) water regime modifier to wetland polygons, ponds, and detention basins in the Palustrine system. This regime most commonly applied to the Aquatic Bed, Emergent, and Unconsolidated Bottom classes, although SMC assigned a limited number (<50) of Semipermanently Flooded polygons to the Forested and Scrub-Shrub classes. We typically determined the designation by vegetation and open water apparent in numerous years of aerial photos, location in the landscape, soil types, and original NWI mapping.
25) We applied the Intermittently Exposed (G) water regime modifier to wetland polygons, ponds, and a limited number (<10) lakes and streams. Most (97%) of the polygons we assigned the Intermittently Exposed regime fall into the Unconsolidated Bottom class. The remaining polygons, with one exception, we assigned to the Aquatic Bed (AB) and Emergent (EM) classes. We typically based our designation on the presence of surface water in numerous years of aerial photos, original NWI mapping, or

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identification as water on USGS quadrangles, soils surveys, and other mapping sources.

26) SMC applied the Permanently Flooded (H) water regime modifier to water bodies and a limited number of wetland polygons across all NWI systems in Lake County (Riverine, Lacustrine, and Palustrine). We assigned all Permanently Flooded polygons to the Aquatic Bed or Unconsolidated Bottom classes. We based our designations on presence of surface water in all or nearly all years of aerial photos, original NWI mapping, or identification as water on USGS quadrangles, soils surveys, and other mapping sources.
27) SMC used the Intermittently Flooded (J) water regime modifier on polygons in the Unconsolidated Shore class (including beaches) and a limited number of polygons assigned to the Rock Bottom, Rocky Shore and Unconsolidated Bottom classes. Most of these polygons belong to the Lacustrine system.
28) SMC applied the Artificially Flooded (K) water regime modifier to ponds constructed for agricultural or water treatment purposes. We assigned all Artificially Flooded polygons to the Palustrine system and the Unconsolidated Bottom class.
29) We assigned special modifiers based on the original NWI mapping for Lake County and observation during the polygon screening process described in **Appendix A.1**, Steps 10 and 11.

## HWI-LC CLASSIFICATION

The following steps describe the process by which SMC assigned NWI Classification codes to the HWI-LC polygons. Steps 30 through 48 typically proceeded concurrently during the polygon screening process described in **Appendix A.2**, steps 4 through 10.

30) SMC staff assigned natural lakes (excluding impoundments and excavated lakes), rivers, streams (excluding ditches), and natural ponds the same NWI codes as identified in the EWI-LC. Where these had special modifiers identifying impoundment (h) or excavation (x), we reviewed the polygon and either dropped the modifier or revised the polygon and we modified the NWI code according to steps 35 through 37.
31) SMC did not consider constructed features such as detention basins, borrow pits, and ditches.
32) Where EWI-LC wetland polygons substantially overlapped (i.e., a majority) the HWI-LC polygon, SMC applied the EWI-LC polygon NWI code to the HWI-LC polygon. When the EWI-LC polygon NWI code included special modifiers, we modified the NWI code according to steps 35 through 37.
33) Where EWI-LC wetland polygons coincided with a significant minority (5%< Area <50%) of the HWI-LC polygon, SMC staff reviewed the polygon during the screening process described in **Appendix A.2**, Steps 4 through 10 and assigned either the EWI-LC polygon NWI code or assigned the NWI code according to steps 38 through 48.
34) Where HWI-LC polygons did not coincide with an EWI-LC polygon or coincided with a small minority of an EWI-LC polygon (<5%), SMC reviewed the polygon during the screening process described in **Appendix A.2**, Steps 4 through 10 and assigned the NWI code according to steps 38 through 48.

### *HWI-LC Polygon Classification Based on Coincident EWI-LC Polygons*

35) In many instances where HWI-LC polygons identified in steps 30 through 32 (above) coincided with an EWI-LC polygon, further review indicated the NWI classification code of the EWI-LC polygon likely was not applicable to the HWI-LC polygon, often due to human modification of the polygon characteristics (e.g., farming, ditching, excavation, impoundment) or in some cases

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afforestation or reforestation. In cases where a special modifier indicated human modification, SMC dropped that modifier from the NWI code.

36) When SMC dropped special modifiers, we examined the water regime modifier. In some cases, if supported by additional historical mapping, aerial photographs, and/or soil mapping, we changed the water regime modifier to the next wetter condition. For example, if SMC identified a coincident EWI-LC polygon as Palustrine Emergent Temporarily Flooded ditched/drained (PEMAd), we might change the underlying HWI-LC polygon to the Seasonally Flooded water regime (PEMC), if supported by additional data, and drop the special modifier. **Table A.3.1**. shows the general water regime correlations to hydric soil map units used in this study.
37) Where HWI-LC polygons identified in steps 30 through 32 (above) coincided with an EWI-LC polygon that required modifications to the system or class assignments, SMC used aerial photos, historic mapping, and the pre-settlement vegetation maps (Bowles and McBride 2005, Westerman not dated) as supporting information. We designated the NWI system and class assignments following steps 11 through 29 above.

### *HWI-LC Polygon Classification Based on Supporting Data (No Coincident EWI-LC Polygon or Significant Difference from EWI-LC Polygon)*

38) SMC assigned HWI-LC polygons "new" NWI codes (i.e., we did not transfer or modify NWI codes from EWI-LC polygons) following steps 11 through 29 above and the considerations described below.
39) We based the NWI class on analysis during the polygon screening process described in **Appendix A.2**, Steps 4 through 10, with importance given to the pre-settlement vegetation maps for Lake County (Bowles and McBride 2005, Westerman not dated).
40) SMC did not apply the Rock Bottom (RB) or Rocky Shore (RS) classes to HWI-LC polygons.
41) We sparingly applied the Scrub-Shrub class to approximately one percent of the polygons due to the low confidence in identifying this vegetation type in the supporting historical data sets.
42) The mixed class Emergent/Forested Broad-Leaved Deciduous (EM/FO1) is prevalent (~20% of polygons) in the HWI-LC data set because the predominance of the "savanna" vegetation type in the pre-settlement vegetation maps (Bowles and McBride 2005, Westerman not dated). We listed the Emergent (EM) class as the first/predominant class in these instances.
43) SMC applied the Forested Needle-Leaved Deciduous (FO2) class/subclass to bogs only; we did not use the Forested Dead (FO5) class/subclass in the HWI-LC data set.
44) SMC applied water regime modifiers based on review of supporting data and the correlation between hydric soil map units and NWI water regimes developed by SMC staff (see **Table A.3.1**.).
45) SMC most commonly assigned the Seasonally Flooded (C) water regime in the HWI-LC (64% of polygons), and we applied it as a "default" value when supporting data were otherwise inconclusive regarding the water regime.
46) SMC staff did not apply the water regime modifiers for Seasonally Flooded/Saturated (E) or Artificially Flooded (K) to HWI-LC polygons.
47) Where supporting data indicated the Semipermanently Flooded (F) water regime or wetter, SMC seldom (<1% of Forested and <2% of Scrub-Shrub polygons) applied these regimes to the Forested (FO) and Scrub-Shrub (SS) classes), regardless of supporting vegetation data.
48) SMC did not apply special modifiers to HWI-LC polygons, as the human modification descriptors are largely not applicable to the presumed pre-settlement landscape and the "Beaver" modifier is difficult to apply based on the supporting data.

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**Table A.3.1. Lake Country Soil Survey Hydric Soil Map Units – NWI Water Regime Correlations for WRAPP GIS Mapping.** (By: SMC)

| Map Unit | Name | Est. Water Regime* | Organic? | Typ. Landscape Position | NRCS Drainage Class |
|---|---|---|---|---|---|
| 67A | Harpster SiCL | C | N | Shallow depressions | PD |
| 103A | Houghton Muck | C | Y | Large closed depressions | VPD |
| 153A | Pella SiCL | C | N | Deep swales | PD |
| 232A | Ashkum SiCL | C | N | Shallow swales | PD |
| 330A | Peotone SiCL | C | N | Large closed depressions | VPD |
| 465A | Montgomery SiCL | C | N | Riverine floodplains (NBCR) | PD |
| 488A | Hooppole L | C | N | Floodplains/Stream terraces | PD |
| 513A | Granby FSL | C | N | Lake Michigan dune swales | PD |
| 523A | Dunham SiCL | C | N | Floodplains/Stream terraces | PD |
| 626A | Kish L | C | N | Floodplains/Stream terraces | PD |
| 1082A | Millington SiL, undrained, occasionally flooded | A | N | Floodplains | PD |
| 1103A | Houghton Muck, undrained | F | Y | Large closed depressions & bogs (Volo Bog, etc.) | VPD |
| 1107A | Sawmill SiCL, undrained | C | N | Riverine floodplains (DPR) | PD |
| 1153A | Pella SiCL, undrained | C | N | Deep swales | PD |
| 1330A | Peotone SiCL, undrained | F | N | Large closed depressions | VPD |
| 1210A | Lena Muck, undrained | F | Y | Closed depressions | VPD |
| 1529A | Selmass L, undrained | C | N | Floodplains/Stream terraces | PD |
| 3107A | Sawmill SiCL, frequently flooded | F | N | Riverine floodplains (DPR) | PD |
| 4103A | Houghton Muck, ponded | F | Y | Large closed depressions | VPD |
| 4777A | Adrian Muck, ponded | F | Y | Lake Michigan dune swales | VPD |
| 8082A | Millington SiL, occasionally flooded | A | N | Floodplains | PD |
| W | Water | H | N | Permanent water bodies | - |

* NWI Water Regimes: A - Temporarily Flooded; C - Seasonally Flooded; F - Semipermanently Flooded; H – Permanently Flooded
** FSL = fine silt loam; L = loam; SiCL = silty clay loam; SiL = silt loam

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### *HWI-LC Polygon Classification Based on Supporting Data (No Coincident EWI-LC Polygon or Significant Difference from EWI-LC Polygon)*

49) SMC assigned HWI-LC polygons "new" NWI codes (i.e., we did not transfer or modify NWI codes from EWI-LC polygons) following steps 11 through 29 above and the considerations described below.
50) We based the NWI class on analysis during the polygon screening process described in **Appendix A.2**, Steps 4 through 10, with importance given to the pre-settlement vegetation maps for Lake County (Bowles and McBride 2005, Westerman not dated).
51) SMC did not apply the Rock Bottom (RB) or Rocky Shore (RS) classes to HWI-LC polygons.
52) We sparingly applied the Scrub-Shrub class to approximately one percent of the polygons due to the low confidence in identifying this vegetation type in the supporting historical data sets.
53) The mixed class Emergent/Forested Broad-Leaved Deciduous (EM/FO1) is prevalent (~20% of polygons) in the HWI-LC data set because the predominance of the "savanna" vegetation type in the pre-settlement

vegetation maps (Bowles and McBride 2005, Westerman not dated). We listed the Emergent (EM) class as the first/predominant class in these instances.

54) SMC applied the Forested Needle-Leaved Deciduous (FO2) class/subclass to bogs only; we did not use the Forested Dead (FO5) class/subclass in the HWI-LC data set.
55) SMC applied water regime modifiers based on review of supporting data and the correlation between hydric soil map units and NWI water regimes developed by SMC staff (see **Table A.3.1**.).
56) SMC most commonly assigned the Seasonally Flooded (C) water regime in the HWI-LC (64% of polygons), and we applied it as a "default" value when supporting data were otherwise inconclusive regarding the water regime.
57) SMC staff did not apply the water regime modifiers for Seasonally Flooded/Saturated (E) or Artificially Flooded (K) to HWI-LC polygons.
58) Where supporting data indicated the Semipermanently Flooded (F) water regime or wetter, SMC seldom (<1% of Forested and <2% of Scrub-Shrub polygons) applied these regimes to the Forested (FO) and Scrub-Shrub (SS) classes), regardless of supporting vegetation data.
59) SMC did not apply special modifiers to HWI-LC polygons, as the human modification descriptors are largely not applicable to the presumed pre-settlement landscape and the "Beaver" modifier is difficult to apply based on the supporting data.

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# APPENDIX A.4

## LLWW CODING

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# APPENDIX A.4 LLWW CODING

## INTRODUCTION

The Lake County Stormwater Management Commission (SMC) developed three geographic databases to provide the most accurate and precise data possible for the Wetland Restoration and Preservation Plan (WRAPP) for Lake County, Illinois. Using geodatabases, maps, and additional information sources that were currently available (see **Appendices A.1** and **A.2**), SMC created the Existing Wetland Inventory (EWI-LC), the Historic Wetland Inventory (HWI-LC) and the Potentially Restorable Wetland (PRW) inventory. These three WRAPP databases are founded on the Lake County Wetlands Inventory (LCWI), a data set developed by the Federal Wetlands Committee and maintained by the Lake County GIS Division. The LCWI, however, does not contain the "Landscape Position, Landform, Water Flow Path, and Waterbody Type" (LLWW) hydrogeomorphic attribute data or descriptors (Tiner 2011) needed to assess wetland functionality.

For SMC to assess wetland functions, the EWI-LC, HWI-LC, and PRW polygons required LLWW descriptors. This appendix details the process SMC used to add LLWW descriptors but may refer to a previous section when the process or information used was identical. Our process and basis for attribute classification are based on the U.S. Fish and Wildlife Service's (USFWS) *Dichotomous Keys and Mapping Codes for Wetland Landscape Position, Landform, Water Flow Path and Waterbody Type Descriptors: Version 2.0* (Tiner 2011). The description that follows references "working" feature classes and datasets, most of which were interim products. In some cases, we give the names of those working datasets only to distinguish between other similar working datasets; the names themselves are relatively meaningless.

Importantly, we do not intend the WRAPP data sets to replace or update the LCWI for Lake County, Illinois.

## EWI-LC CLASSIFICATION

The following steps describe the process by which SMC staff modified the EWI-LC polygons and assigned LLWW descriptors. Portions of this process also describe the enhancement of the LCWI described in **Appendix A.1**, as the mapping and identification of certain water body types is integral to the LLWW classification system.

### *Identification/ Classification of Lakes, Rivers, and Streams*

1) SMC delimited lake and pond shorelines using the "TYPE" field of the breaklines feature class developed from the 2007 LiDAR data ("TYPE" = "Lake") to create a "BRKLN_LK" line feature class (LCGIS 2010). We converted the line data to a "BRKLN_LK_POLY" working polygon feature class that included all lake, pond, and open water areas captured by the 2007 LiDAR processing.

2) A by-product of Step 1 was the creation of lines for all "island" features, either emergent wetlands surrounded by open water or true islands that contain dry land/upland for a significant part of the year. We saved these to a "BRKLN_LKISL" feature class for later review.

3) The project team determined which water bodies in Lake County met the USFWS definition of "Rivers" (Tiner 2011). These are generally defined as lotic (flowing) waters depicted on USGS 1:24,000 scale topographic quadrangles as "double-line" streams or polygons. In Lake County, these include the Fox and Des Plaines Rivers, the Dead River south of the State Park Road,

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and Squaw Creek between Long and Fox Lakes. We considered all other streams ("linear" water bodies) in Lake County as "Streams" and created working line feature classes for both rivers and streams.

4) We selected the 100-year floodplain polygons (Special Flood Hazard Areas) from the most current (2013) Federal Emergency Management Agency (FEMA) flood insurance study that intersected a) "Lotic Rivers" and b) "Lotic Streams." SMC reviewed floodplain polygons and split them as needed to correctly identify floodplains associated with rivers and streams (such as areas near the confluence of a "lotic stream" with a "lotic river"). The USFWS classification methodology (Tiner 2011) defines lotic river and stream wetlands as those occurring within the mapped 100-year floodplain. We exported EWI-LC polygons intersecting "Lotic River" floodplains to a working feature class. Likewise, we exported EWI-LC polygons intersecting "Lotic Stream" floodplains to a separate working feature class. We then reviewed both feature classes and rectified any instances where EWI-LC polygons were included in both Lotic River and Lotic Stream landscape position classes.

5) The WRAPP Technical Advisory Group (TAG) defined lakes as open water bodies 6 acres or greater. We also manually classified a select number of water bodies smaller than 6 acres as lakes based on limnological monitoring data. From the BRKLN_LK_POLY feature class, we selected all polygons 6 acres or greater and created a new working feature class "BRKLN_LK_POLY2."

6) Using the lotic river and lotic stream line features and floodplains created in Step 4, SMC classified features in BRKLN_LK_POLY2 to the Landscape Positions of Lotic River or Lotic Stream. We classified remaining polygons as Terrene. Per USFWS methods, we classified no lakes as having a "lentic" Landscape Position (Tiner 2011). SMC created working feature classes for each landscape position class of lakes.

7) SMC delimited river and stream shorelines using the "TYPE" field of the breaklines feature class developed from the 2007 LiDAR data ("TYPE" = "River") to create a "BRKLN_LOTICarc" working feature class. This layer included larger streams where we generated breaklines for each bank but did not include smaller streams where a single breakline represented the channel.

8) We used the working feature class created in Step 7 (BRKLN_LOTICarc) and the Lotic River line features (Step 3) to create a working polygon feature class, "LR_channels," representing the open water area of all rivers, as defined by USFWS (Tiner 2011).

9) We delimited stream channel centerlines (not necessarily thalwegs) represented by a single breakline using the "TYPE" field of the breaklines feature class developed from the 2007 LiDAR data ("TYPE" = "Stream") to create a "BRKLN_STR" working feature class (LCGIS 2010). Based on a comparison of single-line breaklines with aerial photography and a digital terrain model based on the 2007 LiDAR at selected locations, SMC used a buffer of 3.33 feet on either side of the breakline to estimate the area of normal flow in the stream channel, which we determined was a conservative estimate of channel width (i.e., across the entire geography of the dataset most active channel flow likely occurs across a wider average cross section). We called the resulting working polygon feature class "BRKLN_STR_LS_buff_3_33."

10) SMC used the working feature class created in Step 7 (BRKLN_LOTICarc), the Lotic Stream line features (Step 3), and the buffered centerlines of small stream channels (BRKLN_STR_LS_buff_3_33) to create a working polygon feature class, "LS_channels," representing the open water

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area of all streams, as defined by USFWS (Tiner 2011).

### *Creation of LLWW Attribute Fields*

11) SMC added the attribute fields in **Table A.4.1.** to the EWI-LC for population during subsequent classification. Codes and code descriptions used to populate the attribute fields are listed in **Attachment A.4-1.**

### *Landscape Position and Waterbody Type Classification*

12) SMC attributed polygons adjacent or contiguous to polygons identified as lakes with the lentic landscape position code (LE). We also attributed the lentic code to additional polygons during the visual screening process. Around the Fox Chain O' Lakes system, we used an elevation of 739 feet (above sea level) to determine whether wetlands were in the "lake basin" (i.e., the depression forming the lake) (Tiner 2011) and therefore lentic.

13) SMC used feature classes containing polygons in the Lotic River and Lotic Stream landscape positions created in Step 4 to assign the Lotic River and Lotic Stream landscape position codes (LR and LS, respectively) to EWI-LC polygons using a locational selection operation.

14) SMC assigned all remaining EWI-LC polygons the terrene (TE) landscape position code.

15) We removed polygons representing the open water (channels) of rivers and streams from the EWI-LC using the "erase" geoprocessing tool and the working feature classes created in Steps 8 and 10. We then inserted the features created in Steps 8 and 10 into the EWI-LC database. SMC assigned features corresponding to the open water channels of rivers the lotic river landscape position code (LR) and the "river" waterbody type code (RV); we assigned features corresponding to the open water channels of streams the lotic stream landscape position code (LS) and the "stream" waterbody type code (ST). SMC assigned all rivers and streams the wetland/water body (WL_WB) code for "waterbody" (WB).

**Table A.4.1. Initial Attribute Fields Added to EWI-LC Geodatabase Prior to Polygon Classification.**

| Field Name | Description |
|---|---|
| Acres_Calc | Area of polygon in acres |
| WL_WB | "WL" wetland or "WB" water body (lake, river, stream, or pond) |
| LScapePos | Landscape Position classification code per Tiner 2011 (see Attachment A.4.1) |
| LotGrad | Lotic gradient code per Tiner 2011 (see Attachment A.4.1) |
| LenType | Lentic type code per Tiner 2011 (see Attachment A.4.1) |
| Landform | Landform code per Tiner 2011 (see Attachment A.4.1) |
| LformMod | Landform modifier code per Tiner 2011 (see Attachment A.4.1) |
| WFlowPath | Water Flow Path code per Tiner 2011 (see Attachment A.4.1) |
| WBodyType | Waterbody Type code per Tiner, 2011 (see Attachment A.4.1) |
| WBodyMod | Waterbody modifier code per Tiner 2011 (see Attachment A.4.1) |
| OtherMod | Other modifier code per Tiner 2011 and Lake Co. SMC (see Attachment A.4.1) |

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16) SMC sequentially used each set of lake features (working feature classes) created in Step 6 to remove data for those areas from the EWI-LC database, and then we inserted them into the EWI-LC, like the process used in Step 15. We attributed each set of features the corresponding landscape position code. SMC assigned polygons the "lake" waterbody type code (LK), and we assigned all lakes the wetland/waterbody (WL_WB) code for "waterbody" (WB).

17) SMC used the polygons under 6 acres from the "BRKLN_LK_POLY" features created in Step 1 to create polygons representing ponds. We derived Landscape Position coding from the existing EWI-LC polygons and assigned these polygons the "pond" waterbody type code (PD). We then assigned all ponds the wetland/waterbody (WL_WB) code for "waterbody" (WB). We applied and/or removed the pond waterbody code from polygons as applicable during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

18) For all polygons that were not assigned the wetland/waterbody (WL_WB) code for "waterbody" (WB), SMC assigned the wetland/waterbody code for "wetland" (WL).

19) SMC added lotic gradient and lentic type modifiers of the landscape position classifications during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

### *Landform Classification*

20) SMC used polygons from the "BRKLN_LKISL" feature class created in Step 2 to identify Islands, and we assigned those polygons the "Island" landform code (IL).

21) SMC then selected polygons that intersected mapped floodplains. If a polygon was coded as a water body (WB) or the terrene (TE) or lentic (LE) landscape position, we removed it from the selection and assigned all remaining polygons the floodplain (FP) landform code.

22) Next, SMC selected polygons that were identified as wetlands (WL), were contiguous to lakes and terrene ponds, and intersected original NWI wetland polygons with a water regime of Semipermanently Flooded (F) or wetter and a vegetated class code (e.g., EM, FO, SS). To those polygons we assigned the Fringe (FR) landform code.

23) SMC selected polygons identified as wetlands (WL), were contiguous to lakes and assigned them the lentic landscape position (LE). We then removed polygons assigned the fringe (FR) landform code from the selection and assigned the remaining selected polygons the basin (BA) landform code.

24) Next, SMC selected polygons with the lotic river (LR) landscape position code. Those identified as water bodies (WB) or assigned the floodplain (FP) or island (IL) landform codes we removed from the selection. We individually screened the remaining selected polygons and assigned landform, water flow path, and modifier codes based on supporting data.

25) We temporarily assigned Terrene (TE) polygons that were not adjacent to a water body the basin (BA) landform code. We then verified or modified that classification as applicable during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

26) Flat (FL), non-terrene basins (BA) and slope (SL) landform codes we largely assigned during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

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27) SMC then applied and/or removed landform codes and modifiers from polygons as applicable during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

### *Water Flow Path Classification*

28) SMC assigned all polygons classified in the lotic river (LR) landscape position the throughflow (TH) water flow path code.

29) All polygons classified in the lentic (LE) landscape position we temporarily assigned the bidirectional (BI) water flow path code. We then verified or modified that classification as applicable during the polygon screening process described in **Appendix A.1,** Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10. Most lentic wetlands we ultimately classified as bidirectional-throughflow (TB).

30) SMC initially assigned all polygons classified in the lotic stream (LS) landscape position the throughflow (TH) water flow path code. We then verified or modified that classification as applicable during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10. We modified polygons associated with intermittent and ephemeral streams to the throughflow-intermittent (TI) water flow path; those drained only by ditches we modified to throughflow-artificial (TA); and polygons associated with headwaters we modified to the outflow (OU) water flow path.

31) SMC assigned or modified the water flow path classification for most terrene (TE) and many other polygons during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

### *Classification of Remaining LLWW Attributes*

32) SMC assigned remaining attributes—Including waterbody type and "other modifiers"—during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10. Critically, we assigned slope (SL) and flat (FL) landform types as well as many landform modifiers, including woodland vernal (wv) basin types, during this process. Attributes for most terrene (TE) wetland polygons we assigned during this process as well.

## HWI-LC CLASSIFICATION

The following steps describe the process by which SMC modified the HWI-LC polygons and assigned LLWW descriptors.

33) We assigned natural lakes (excluding impoundments and excavated lakes), rivers, streams (excluding ditches), and natural ponds the same LLWW codes identified in the EWI-LC. Where these had waterbody type codes identifying impoundment, excavation or channelization, SMC reviewed the polygon and modified the code or revised the polygon and modified the LLWW code according to steps 38 and 39.

34) We did not consider constructed water bodies such as detention basins, borrow pits, and ditches.

35) Where EWI-LC wetland polygons coincided with most of the HWI-LC polygon, we applied the EWI-LC polygon LLWW code to HWI-LC polygon. If the EWI-LC polygon LLWW code was indicative of human modification (such as artificial water flow path, impoundment, or channelization/ditching), we modified the LLWW code according to steps 38 and 39.

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36) Where EWI-LC wetland polygons coincided with a significant minority (5%< Area <50%) of the HWI-LC polygon, we reviewed the polygon during the polygon screening process described in **Appendix A.2**, Steps 4 through 10 and either assigned the EWI-LC polygon LLWW code or the LLWW code according to steps 40 through 47.

37) Where HWI-LC polygons did not coincide with an EWI-LC polygon or coincided with a small minority of an EWI-LC polygon (<5%), we reviewed the polygon during the polygon screening process described in **Appendix A.2**, Steps 4 through 10 and assigned the LLWW code according to steps 40 through 47.

### *HWI-LC Polygon Classification Based on Coincident EWI-LC Polygons*

38) Where HWI-LC polygons identified in steps 33 through 35 (above) coincided with an EWI-LC polygon, instances occurred where further SMC review indicated the LLWW classification code of the EWI-LC polygon likely was not applicable to the HWI-LC polygon, often due to human modification of the polygon characteristics (e.g., ditching, excavation, channelization, impoundment). In cases where the EWI-LC LLWW code indicated human modification, we modified the code based on supporting data (see **Table A.2.1.**). In many cases this resulted in a change to the water flow path, waterbody type, and/or lotic gradient and lentic type codes.

39) SMC limited waterbody type and waterbody modifier codes assigned to HWI-LC polygons to River – low gradient (RV1); Stream – low gradient (ST1), low gradient connecting channel (ST1a) and intermittent (ST4); Lake – natural (L1), natural main body (L1a), natural open embayment (L1b), natural semi-enclosed embayment (L1c), natural wetland landscape matrix (L1e) and natural wetland landscape matrix floodplain – herb matrix (L1e6); Pond – natural (PD1), natural woodland-wetland (PD1b), natural woodland-dryland (PD1c), natural prairie - wetland (PD1d), natural prairie-dryland (PD1e), natural floodplain (PD1q), natural floodplain – herb matrix (PD1q3), natural floodplain – mixed matrix (PD1q4) and natural – other (PD1r).

### *HWI-LC Polygon Classification Based on Supporting Data (No Coincident EWI-LC Polygon or Significant Difference from EWI-LC Polygon)*

40) SMC assigned HWI-LC polygons "new" LLWW codes (i.e., we did not transfer or modify LLWW codes from EWI-LC polygons) following steps 12 through 32 above and the considerations described below.

41) SMC examined HWI-LC polygons near rivers but outside of present mapped floodplains to determine if historic floodplain filling had occurred. If this was the case, we assigned the polygons the floodplain (FP) landform.

42) We typically assigned polygons associated with Soil Map Units 330A and 1330A, Peotone silty clay loam the terrene (TE) landscape position, basin (BA) landform and isolated (IS) water flow path codes unless we found additional information in the supporting data to support assigning other designations.

43) We sparingly assigned the island (IL) and slope (SL) landform classifications, as the location and extent of historical riverine, stream, and pond islands and slope (seep) wetlands were very difficult to identify within the supporting data with a high degree of confidence.

44) SMC did not assign the artificial water flow path types throughflow-artificial (TA) and outflow-artificial (OA) to HWI-LC polygons.

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45) The fragmentation and modification of rivers and streams and the creation and modification of lakes and ponds is evident in the reduction of the sheer number of water body polygons in the HWI-LC (601) relative to the EWI-LC (6,920). Constructed stormwater, ornamental, and recreational ponds account for much of this difference.

46) Landform and other modifiers we applied more sparingly in some cases, although the overall percentage of wetland polygons assigned a landform modifier is not that different between the EWI-LC (26%) and the HWI-LC (22%). SMC did not apply a few modifiers used in the EWI-LC to HWI-LC polygons because the modifiers indicate human modification or were insignificant within the data. These include the following: former floodplain (ff), island (il), and impoundment (ip). Others such as woodland vernal (wv) were very difficult to identify within the supporting data with a high degree of confidence and therefore are under-represented in the HWI-LC.

47) Classification of HWI-LC polygons occurred during the polygon screening process described in **Appendix A.1**, Steps 10 and 11 and **Appendix A.2**, Steps 4 through 10.

## REFERENCES/LITERATURE CITED

Federal Geographic Data Committee (FGDC). 2013. *Classification of Wetlands and Deepwater Habitats of the United States, Second Ed.* Adapted from Cowardin, Carter, Golet and LaRoe (1979). FGDC Wetland Subcommittee. August 2013. FGDC–STD-004-2013. 85 pp.

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Tiner, R.W. 2011. *Dichotomous Keys and Mapping Codes for Wetland Landscape Position, Landform, Water Flow Path, and Waterbody Type Descriptors: Version 2.0*. U.S. Fish and Wildlife Service, National Wetlands Inventory Northeast Region, Hadley, MA.

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## ATTACHMENT A.4-1. LLWW CLASSIFICATION CODE DESCRIPTORS (AFTER TINER, 2011).

**Landscape Position (LscapePos)** Applies to all polygons

| | | |
|---|---|---|
| LE | Lentic | Wetland lies along a lake or within its basin (i.e., the depression forming the lake). |
| LR | Lotic river | Wetland that is periodically flooded by a river. |
| LS | Lotic stream | Wetland that is periodically flooded by a stream. |
| TE | Terrene | Wetland that is surrounded by upland, borders a pond that is surrounded by upland, is near but not affected by a lake/stream/river. |

**Lotic Gradient (LotGrad)** Applies to Lotic river and Lotic stream Landscape Positions only

| | | |
|---|---|---|
| 1 | Low | All perennial rivers/streams in Lake County are classified as low gradient |
| 4 | Intermittent | |
| 6 | Dammed* | |
| a | lock and dammed | |
| b | run-of-river dam | Dam does not impound a lake or pond within pool |
| c | beaver | |
| d | other dammed | Dam without lock(s) that impounds a lake or pond |
| 7 | Artificial* | Ditches |

**Lentic Type (LenType)** Applies to Lentic Landscape Position only

| | | |
|---|---|---|
| 1 | Natural deep lake | |
| a | main body | |
| b | open embayment | |
| c | semi-enclosed embayment | |
| e | wetland landscape matrix | |
| e3 | deltaic | |
| 2 | Dammed river valley lake* | |
| c | flood control | |
| d | other | |
| 3 | Other dammed lake* | |
| a | former natural | Natural lakes with constructed spillways/outlets (e.g., Third, Gages) |
| b | artificial | Includes impounded wetlands, etc. |
| 4 | Deep excavated lake* | Quarries, borrow pits, and large detention basins |
| 5 | Shallow excavated lake* | Includes settling basins |

**Landform (Landform)** Applies to wetland polygons, water body polygons may have the waterbody type code in this field

| | |
|---|---|
| BA | Basin |
| FL | Flat |
| FP | Floodplain |
| FR | Fringe |
| IL | Island |
| SL | Slope |

**Landform Modifier (LformMod)** Applies to certain wetland polygons where applicable

| | | |
|---|---|---|
| ba | basin | Applies to depressions within Floodplain landforms |
| bc | beach | Applies to Fringe landforms |
| ff | former floodplain* | Applies to modified Basin and Flat landforms |
| fl | flat | Applies to relatively level areas within Floodplain landforms |
| id | interdunal | Applies to Basin landforms along Lake Michigan |

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| | | |
|---|---|---|
| il | island | Applies to Basin, Floodplain and Fringe landforms associated with islands |
| ip | impoundment (created)* | Applies to Basin landforms created by an impoundment |
| pd | pond | Applies to Basin, Fringe and Island landforms associated with ponds |
| sl | slough/drainageway | Applies to Basin and Fringe landforms. Indicates flow with no defined channel or flow through a linear or sloped depression |
| st | stream | Applies to Basin landforms associated with streams |
| wv | woodland vernal | Applies to Basin landforms |

**Water Flow Path (WFlowPath)** Applies to all polygons

BI Bidirectional-nontidal
BIA Bidirectional-nontidal Artificial (e.g., impounded)*
BO Bidirectional-nontidal/outflow (lake)
IB Bidirectional-nontidal/isolated (lake)
II Isolated-inflow (connected to other wetlands in an isolated complex)
IN Inflow
IO Isolated-outflow (connected to other wetlands in an isolated complex)
IS Isolated
IT Isolated-throughflow (connected to other wetlands in an isolated complex)
OA Outflow-artificial*
OI Outflow-intermittent
OU Outflow
TA Throughflow-artificial*
TB Bidirectional-nontidal/throughflow (lake)
TH Throughflow
TI Throughflow-intermittent

**Waterbody Type (WBodyType)** Applies to water body polygons

LK Lake
PD Pond
RV River
ST Stream

**Waterbody Modifier (WBodyMod)** Applies to water body polygons

Waterbody Modifiers applied to Lakes (LK)

- 1 natural lake (see also Pond codes for possible specific types)
  - a main body
  - b open embayment
  - c semi-enclosed embayment
  - e wetland landscape matrix (lake embedded in wetland)
    - e6 floodplain – herb matrix
- 2 dammed river valley lake*
  - c flood control
  - d other
- 3 other dammed lake*
  - a former natural
  - b artificial
- 4 Deep excavated lake (e.g., quarry lake)*
- 5 Shallow excavated lake (e.g., settling basin)*

Waterbody Modifiers applied to Ponds (PD)

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1 natural
- b woodland-wetland
- c woodland-dryland
- d prairie-wetland (pothole)
- e prairie-dryland (pothole)
- m vernal-woodland*
- o interdunal
- q floodplain
  - q3 floodplain – herb matrix
  - q4 floodplain – mixed matrix

2 dammed/impounded*
- a agriculture
  - a1 cropland
- c commercial
  - c1 commercial-stormwater
- e residential
  - e1 residential-stormwater
- g golf
- h wildlife management
- i other recreational
- o other

3 excavated*
- a agriculture
  - a1 cropland
  - a2 livestock
- c commercial
  - c1 commercial-stormwater
- d industrial
  - d1 industrial-stormwater
- e residential
  - e1 residential-stormwater
- f sewage treatment
- g golf
- h wildlife management
- i other recreational
- j mining
  - j1 sand/gravel
- o other

4 beaver*

Waterbody Modifiers applied to Rivers (RV)

1 low gradient

6 dammed gradient*
- a lock and dammed
- b run-of-river dammed

Waterbody Modifiers applied to Streams (ST)

1 low gradient
- a connecting channel
- b channelized*

4 intermittent gradient

6 dammed*

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| | | |
|---|---|---|
| | d | other dammed |
| 7 | artificial* | |
| | a | connecting channel |
| | b | ditch |

**Other Modifiers** Applies to certain polygons where applicable

| | |
|---|---|
| aa | abandoned agriculture (former farmed wetland now regenerating)* |
| ag | agricultural/farmed* |
| bg | bog |
| bv | beaver-influenced wetland |
| ch | channelized, dredged or excavated* |
| da | disposal/fill area (typically dredged spoil)* |
| dr | partly drained* |
| fd | flatwoods |
| fm | floating mat |
| gd | groundwater-dominated |
| gl | Great Lakes coastal wetland |
| gz | grazed* |
| hi | human-induced* |
| hw | headwater |
| li | lake island (wetland associated with a lake island) |
| lo | American lotus (*Nelumbo lutea*) bed* |
| lv | leveed* |
| mi | wetland mitigation site (if known)* |
| ms | meander scar/former lotic channel |
| ox | oxbow |
| ri | river island (wetland associated with a river island) |
| rs | ridge-and-swale complex (wetland part of this type complex) |
| ss | subsurface flow |
| tg | turfgrass (as dominant vegetation type)* |

*Applies to EWI-LC polygons only

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# APPENDIX A.5

## W-PAWF CODING

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# APPENDIX A.5 W-PAWF CODING

## INTRODUCTION

**Section 4.4** of the WRAPP report discusses the Watershed-Based Preliminary Assessment of Wetland Functions (W-PAWF) in depth. This appendix includes additional details regarding the selection criteria; Landscape Position, Landform, Water Flowpath, and Waterbody (LLWW) descriptors; and National Wetland Inventory (NWI) classification codes used to predict wetland functional significance levels. SMC used the criteria below to classify polygons in the Existing Wetland Inventory (EWI-LC), the Historic Wetland Inventory (HWI-LC), and Potentially Restorable Wetlands (PRW) polygon databases.

Some selection criteria do not apply uniformly across the EWI-LC, HWI-LC, and PRW databases. For example, criteria that apply to water bodies do not apply to the PRW database, which includes only wetland polygons. Criteria that apply to stormwater basins only apply to the EWI-LC because there are no stormwater basins included in the HWI-LC or PRW databases. **Table A.5.1** clarifies how we symbolized the criteria codes based on which data sets apply for that criterion. If we list a data set as "not applicable," this indicates at least one of two circumstances: 1) the criterion is based on a feature or condition that is, by definition, not included in the dataset; or 2) we applied the criterion to the data set but found no polygons to satisfy it.

**Table A.5.1. Functional Selection Criteria Code Symbol Explanation.**

| Symbol | Criterion Applies | Criterion Does Not Apply |
|---|---|---|
| Plain Typeface | All datasets (EWI-LC, HWI-LC, PRW) | None |
| **Bold Typeface** | EWI-LC, PRW datasets | HWI-LC dataset |
| *Italic Typeface* | EWI-LC, HWI datasets | PRW dataset |
| ***Bold Italic Typeface*** | EWI-LC dataset only | HWI-LC, PRW datasets |

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**Carbon Sequestration**

*The carbon sequestration function relates to a site's ability to store carbon and help reduce greenhouse gases, slowing climate change. All wetlands store carbon to some degree. However, sites with deep organic soils (so long as they are not ditched, drained, or farmed) support this function at a high level, as do areas of aquatic bed. Woody wetlands that are flooded or saturated seasonally or longer also have high functionality because woody plants can store carbon above-ground. Ditched and drained wetlands with organic soils have moderate functionality, as do many vegetated wetlands on mineral soils (so long as they are seasonally flooded or wetter). Vernal pools and wetlands that have been placed into agriculture rate low, as do ephemeral and intermittent streams.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • CARB_H1: Vegetated wetlands on organic soils (Histosols), not drained/ditched, and excluding vernal pools and farmed wetlands<br>• CARB_H2: Palustrine forested, scrub-shrub or mixes of those wetlands on mineral soils with NWI Water Regime C, D, E, F, H or K, excluding vernal pools<br>• CARB_H3: Aquatic Beds (Lacustrine and Palustrine) and their mixes with other vegetated wetland classes (e.g., emergent, forested, & scrub-shrub) | • Wetlands only; Polygon intersects Soil Map Unit 103A, 1103A, 1210A, 4103A, or 4777A AND NWI Class = EM, SS, or FO AND other modifier is NOT = ag, ch or dr and NWI modifier is NOT = f or d AND IS NOT TE-BA wv<br>• Wetlands only; Polygon intersects hydric soils NOT in the Map Units listed above AND NWI System/Class = PSS, PFO or a combination of these classes and NWI Water Regime = C, D, E, F, H, or K AND other modifier is NOT = ag and NWI modifier is NOT = f AND is NOT TE-BA wv<br>• NWI System/Class = PAB, L1AB, or L2AB AND mixes of these with NWI Class = EM, FO, or SS |
| Moderate | • **CARB_ M1**: All vegetated wetlands on organic soils (Histosols), drained/ditched)<br>• CARB_M2: Other vegetated wetlands on mineral soils with NWI Water Regime C, D, E, F, H or K, and excluding vernal pools and farmed wetlands<br>• CARB_M3: Palustrine forested, scrub-shrub or mixes of those wetlands on mineral soils with NWI Water Regime A, B, G or J | • Wetlands only; Polygon intersects Soil Map Unit 103A, 1103A, 1210A, 4103A, or 4777A AND other modifier is NOT = ag and NWI modifier is NOT = f AND not rated High<br>• Wetlands only; Polygon intersects hydric soils NOT in the Map Units listed above AND NWI Class = EM, FO, SS, or combination of those classes AND NWI Water Regime = C, D, E, F, H, or K AND other modifier is NOT = ag and NWI modifier is NOT = f AND IS NOT TE-BA wv AND not rated High<br>• Wetlands only; Polygon intersects hydric soils NOT in the Map Units listed above AND NWI System/Class = PSS, PFO or a combination and NWI Water Regime = A, B, G, or J AND other modifier is NOT = ag and NWI modifier is NOT = f |
| Low | • CARB_L1: All remaining wetlands<br>• *CARB_L2*: Ephemeral and Intermittent Streams | • Remaining wetland polygons not rated High or Moderate; excludes NWI Class = UB AND Waterbody = LK, RV, ST, or PD<br>• NWI System/Class = R4SB |
| n/a | • *CARB_NA*: All remaining water bodies | • Remaining water bodies not rated High, Moderate or Low |

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**Flood Water Storage**

*The flood water storage function relates to a site's ability to delay downstream flooding and/or lower flood heights. Except for slope wetlands located outside of mapped flood hazard areas (e.g., seeps/springs on ravines), most wetlands perform this function to some degree. By their very nature, wetlands located within mapped special flood hazard zones have high functionality, as do pocket or bowl-shaped wetlands within uplands that store at least 0.75 acre-feet of runoff, throughflow and intermittent ponds (and their associated basin, fringe, and island wetlands), and constructed stormwater basins. Most wetlands and water bodies located outside of mapped floodplains have moderate functionality. Slope wetlands within the mapped FEMA floodplain rate low, and this function does not apply to slope wetlands located outside of FEMA 100/500 zones (e.g., seeps/springs on ravines).*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • FLD_H1: Wetlands & water bodies assoc. w/FEMA 100 & 500 & SMC-approved floodplain studies, inundation + SMC/PBD survey info & known structural flooding, excluding Slope wetlands<br>• FLD_H2: Terrene basins with more than 0.75 acre-ft of storage (based on 2007 LiDAR DTM)<br>• FLD_H3: Throughflow & Throughflow-Intermittent Ponds and associated Basin, Fringe, and Island wetlands, and remaining lakes (>6 acres) not located in floodplain<br>• ***FLD_H4***: Polygons identified as stormwater basins | • Polygon intersects FEMA SFHA & Fringe (0.2% Chance Annual Flood), excluding Landform = SL<br>• Landscape Position = TE AND Landform = BA AND Storage > 0.75 Acre-ft<br>• Waterbody Type = PD AND Water Flow Path = TH or TI OR Landform = BA, FR or IL AND touches water body identified in first part; OR Waterbody = LK and not rated High in previous bullets<br>• Waterbody Type = PD and Water Bod Modifier = 2c1, 2d1, 2e1, 3c1, 3d1, or 3e1 |
| Moderate | • FLD_M1: Wetlands and water bodies that intersect the USGS flood of record (Hydro Atlas) not rated High, excluding Slope wetlands<br>• FLD_M2: Wetlands & water bodies associated with Rivers, Streams, and Lakes with no mapped FEMA floodplain or outside of the mapped floodplain and not rated High<br>• FLD_M3: Flat wetlands outside of mapped floodplains<br>• *FLD_M4*: All remaining Ponds not rated High or Moderate<br>• ***FLD_M5***: Remaining Fringe and Island wetlands and remaining lentic and lotic wetlands<br>• FLD_M6: Remaining Basin wetlands that are isolated or impounded and not slough wetlands (water flowing through wetlands with no defined or discernible channel) | • Polygon intersects USGS Flood of Record polygon AND is NOT rated High AND NOT landform = SL<br>• Landscape Position = LE, LS or LR OR Waterbody Type = LK, RV or ST; AND polygon does NOT intersect SFHA or Fringe (0.2% Chance Annual Flood) AND not rated High<br>• Landform = FL AND does NOT intersect SFHA or Fringe (0.2% Chance Annual Flood)<br>• Waterbody Type = PD, not already rated High or Moderate<br>• Wetland not rated High or Moderate above AND Landform = FR or IL OR Landscape Position = LE, LS, or LR<br>• Wetland not rated High or Moderate above AND Landform = BA AND Landform Modifier is NOT sl; AND Water Flow Path = IB, IS II, IN, IT, or IO OR Landform Modifier = ip |
| Low | • FLD_L1: Remaining wetlands that are not Slope wetlands, including slough wetlands<br>• FLD_L2: Slope wetlands within FEMA 100 or 500 yr floodplain | • Wetland not rated High or Moderate above AND Landform is NOT = SL<br>• Landform = SL and polygon intersects FEMA 100/500 |
| n/a | • FLD_NA: All remaining Slope wetlands | • Landform = SL and polygon NOT in FEMA 100/500 |

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**Native Fish Habitat**

*The Technical Advisory Group identified Native Fish Habitat as a significant function for wetlands and water bodies in Lake County. Wetlands in this category are predicted to provide spawning, nursery, foraging, refuge and/or cover habitat for at least some portion of the fishes' life cycle during most or all years. Glacial lakes (including modified glacial lakes), rivers, undammed segments of perennial streams, and associated wetlands that are flooded semi-permanently or for longer durations are identified as indicators predicting high functional significance for native fish habitat. Water bodies and wetlands harboring threatened or endangered fishes are predicted to have high functional significance for existing water bodies and wetlands. Habitats that retain natural characteristics (e.g., natural stream channel form) and wetter hydrologic regimes are predicted to increase functional significance, while modification of aquatic habitat (such as channelization), and drier hydrologic regimes are predicted to decrease functional significance. Perennial and natural connections between water bodies and wetlands, including headwaters, are predicted to increase functional significance, while segmentation, fragmentation, and intermittent connectivity are predicted to reduce functional significance.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • *FISH_H1*: Rivers and natural Lakes, including those modified with spillways, dams or channels | • Waterbody Type = LK1, LK3a, or RV |
| | • *FISH_H2*: Perennial, non-channelized Streams with a barrier-free connection to a River or natural Lake | • Waterbody Type = ST1 or ST1a below 1st dam upstream of Waterbody Type = RV, LK, or Lake Michigan AND other modifiers do not include ch |
| | • FISH_H3: Wetlands contiguous to water bodies in FISH_H1 or FISH_H2 that are flooded semi-permanently or for a longer duration. | • Wetlands Only; NWI Water Regime = F, G, or H, AND touches boundary of water bodies identified above |
| | • ***FISH_H4***: Wetlands and water bodies where a recent occurrence of an Illinois or Federal threatened or endangered fish species has been documented (for EWI-LC assessment only) | • Polygon intersects with verified Threatened or Endangered fish location based on June 2016 INAI geographic information layer |
| | • FISH_H5: Headwater wetlands except artificial outflow types | • Other modifiers = hw AND Water Flow Path IS NOT = IOA, OA, TA, or BIA |
| | • FISH_ H6: Natural Ponds and wetlands that are semi-permanently flooded or inundated for longer durations (includes fringe Ponds and Pond islands) within polygons that meet FISH_H1-H5. | • Polygon is completely surrounded by polygons identified in FISH_H1-H5 AND NWI Water Regime = F, G, or H. For WB = PD, NWI Modifier IS NOT x OR h OR Waterbody Type IS NOT 2, 3 OR 7, OR other modifier IS NOT ch |
| Moderate | • ***FISH_M1***: Artificial Lakes created by impoundment or excavation | • Waterbody Type = LK2, LK3b, LK4, LK5, or LK6 |
| | • ***FISH_M2***: Perennial unchannelized Streams upstream of 1st dam above mouth at River, glacial Lake, or Lake Michigan | • Waterbody Type = ST6, OR ST1 AND upstream of dam |
| | • ***FISH_M3***: Perennial channelized Streams with a natural or permanent, barrier-free connection to a River, natural Lake, or Lake Michigan | • Waterbody Type = ST1/1a AND other modifiers = ch OR NWI Modifier = d OR Waterbody Type = ST1b |
| | • *FISH_M4*: Intermittent unchannelized, undammed Streams with a barrier-free connection to a natural Lake or River | • Waterbody Type = ST4 AND NWI Water Regime = C AND downstream of first dam AND other modifiers are NOT ch |

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|---|---|---|
| | • FISH_M5: Wetlands that are contiguous to the water bodies defined under FISH_M1-M4 AND are semi-permanently flooded or inundated for a longer duration<br>• *FISH_M6*: Remaining Ponds contiguous to polygons rated High or identified in FISH_M1-M5 including excavated/impounded online Ponds that are semi-permanently flooded or wetter; and all remaining permanently flooded natural Ponds (e.g., isolated Ponds)<br>• **FISH_M7**: Fringe and Island wetlands that are semi-permanently flooded or inundated for longer durations and are contiguous to Ponds rated Moderate<br>• **FISH_M8**: Artificial outflow type (ditched) Headwater wetlands<br>• FISH_M9: Wetlands that are flooded seasonally or for a longer duration and are contiguous to polygons rated High, excluding those with artificial Water Flow Path types (connected by ditches)<br>• FISH_M10: All remaining Lotic River Floodplain Basin Wetlands | • NWI Water Regime = F, G, or H, AND wetland touches boundary of water bodies identified in FISH_M1-M4<br>• Waterbody Type = PD AND NWI Water Regime = F, G, or H AND touches polygon rated High or defined above OR Waterbody type = PD1 AND NWI Water Regime = H<br>• Touches boundary of Pond rated Moderate AND Landform = FR or IL AND NWI Water Regime = F, G, or H<br>• Other modifiers = hw AND Water Flow Path = IOA, OA, TA, or BIA<br>• NWI Water Regime = C, E, F, G, or H, AND Wetland touches boundary of water bodies and Wetlands rated High, AND Flow Path IS NOT IOA, OA, TA, or BIA<br>• Landscape Position = LR AND Landform = FP AND Landform Modifier = ba |
| Low | • *FISH_L1*: All remaining water bodies (Lakes, Rivers, Streams, Ponds), excluding dry detention basins coded as Ponds and artificially flooded Ponds<br>• FISH_L2: All remaining wetlands contiguous to water bodies, excluding ephemeral Streams and dry detention basins<br>• FISH_L3: All remaining wetlands that are flooded temporarily and contiguous to polygons rated High<br>• FISH_L4: Basin wetlands that are flooded seasonally or for longer durations<br>• FISH_L5: All remaining Floodplain wetlands that are not farmed and are flooded seasonally or for longer durations<br>• FISH_L6: All remaining outflow and throughflow wetlands that are flooded seasonally or for longer durations and are contiguous to polygons rated High or Moderate, excluding farmed wetlands | • WL_WB = WB AND is NOT rated High or Moderate; excludes detention basins with NWI Water Regime = A or J and ponds with NWI Water Regime = K<br>• Touches boundary of water body polygon; excludes WB = ST AND detention basins with NWI Water Regime = A or J<br>• Touches boundary of polygon rated High AND NWI Water Regime = A AND not rated High or Moderate<br>• Landform = BA AND NWI Water Regime = C, E, F, G, or H AND wetland is not rated High or Moderate<br>• Wetland is not rated High or Moderate AND Landform = FP AND NWI Water Regime = C, E, F, G, or H AND other modifier is NOT ag or NWI other modifier is NOT f<br>• Wetland is not rated High or Moderate AND touches boundary of polygon rated High or Moderate AND Water Flow Path = OU, OI, OA, TH, TI, TA, IO, IT, BO or TB AND NWI Water Regime = C, E, F, G, or H |
| N/A | • FISH_NA: All remaining wetlands and water bodies | |

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**Nutrient Transformation (Phosphorus focus)**

*Nutrient transformation relates to a wetland or water body's ability to remove nutrients from the water column and improve local water quality. All wetlands perform this function to some degree, and size is not a factor in the ability to perform the function. However, it is a factor in the degree, as larger wetlands typically have greater capacity. Vegetative growth and hydrologic regime play important roles in P uptake and release. Plant uptake accounts for short-term P retention, and sedimentation and adsorption typically emphasize longer-term retention processes. Most isolated wetlands function at a high level. Wetlands with drier water regimes (e.g., seasonally flooded or saturated) tend to have moderate functionality. Slope wetlands, vernal pools, water bodies, and other wetlands not rated as high or moderate have low functionality. Ditching or farming reduces functionality one level (e.g., high becomes moderate, moderate becomes low).*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • NUTR_H1: Isolated wetlands (excluding vernal pools and farmed wetlands) | • Wetlands only; NWI System = P AND Water Flow Path = IS, IB, II, IT, IO or IN; AND NOT other modifier = ag or wv OR NWI modifier = f |
| Moderate | • NUTR_M1: Throughflow- and outflow-type wetlands with NWI Water Regimes B (seasonally saturated) or C (seasonally flooded), excluding ditched wetlands and farmed wetlands<br>• ***NUTR_M2***: Terrene Basin and Terrene Flat isolated farmed wetlands (i.e., agricultural wetlands) | • Wetlands only; NWI System = P AND Water Flow Path is NOT IS or IN; AND NWI Water Regime = B or C; AND NOT other modifier = ag OR NWI modifier = f or d OR Landform = SL<br>• Wetlands only; NWI System = P; Landscape Position = TE AND Landform = BA or FL AND Water Flow Path = IS, IB, II, IT, IO or IN AND other modifier = ag OR NWI modifier = f |
| Low | • NUTR_L1: All remaining wetlands and water bodies | • All polygons not in above categories |
| n/a | none | |

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**Sediment and Other Particulate Retention**

*The sediment/other particulate retention function relates to a wetland or water body's ability to retain sediment that would otherwise move downstream and build up in rivers, streams, lakes, or ponds. All wetlands perform this function to some degree. In general, however, vegetation is a key factor to higher functionality because plants slow the water down, which allows sediment to settle out. Water depth is also a key factor. Therefore, areas with high function include basin, fringe and island wetlands that are associated with lakes, floodplain wetlands (excluding unconsolidated shore types), basin wetlands that are surrounded by uplands, and areas with water more than 6.6 feet (2 m) deep. Wetlands where water flows through them (including intermittently) and basin wetlands with outflow (including intermittent) typically rate moderate, as do all wetlands associated with ponds.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • SED_H1: Basin, Fringe, and Island wetlands associated with lakes; Unconsolidated Shore types excluded<br>• SED_H2: Floodplain wetlands; Unconsolidated Shore types excluded.<br>• SED_H3: Terrene Basin Isolated wetlands<br>• *SED_H4*: Lacustrine Limnetic systems (depth > 2m) | • Wetlands only; Landscape Position = LE AND Landform = BA, FR, or IL; NWI Class US is excluded<br>• Wetlands only; Landform = FP; NWI Class US is excluded<br>• Wetlands only; Landscape Position = TE AND Landform = BA AND Water Flow Path = IS, IO, II, IB, IN or IT<br>• NWI System = L1 AND Waterbody = LK |
| Moderate | • SED_M1: Island wetlands (other than those associated with lakes)<br>• SED_M2: Lotic Stream Basin, Flat, and Fringe wetlands that are Throughflow or Throughflow-Intermittent<br>• SED_M3: Lotic River Basin, Flat and Fringe Throughflow wetlands<br>• *SED_M4*: Throughflow or Throughflow-Intermittent Ponds<br>• SED_M5: Terrene Basin wetlands that are Throughflow-Intermittent, Outflow, Outflow-Intermittent, or Outflow Artificial<br>• *SED_M6*: Lacustrine Littoral systems, except Unconsolidated Shore types<br>• SED_M7: All wetlands associated with a Pond | • Wetlands only; Landscape Position IS NOT LE AND Landform = IL<br>• Wetlands only; Landscape Position = LS AND Landform = BA, FL, or FR AND Water Flow Path = TH or TI<br>• Wetlands only; Landscape Position = LR AND Landform = BA, FL, or FR AND Water Flow Path = TH or TI<br>• Waterbody Type = PD AND Water Flow Path = TH or TI<br>• Wetlands only; Landscape Position = TE AND Landform = BA AND Water Flow Path = TI, OU, OI, or OA<br>• NWI System = L2 AND Waterbody = LK; NWI Class US is excluded<br>• Wetlands only; boundary touches polygon with Waterbody Type = PD AND NOT rated High |
| Low | • SED_L1: All remaining wetlands and water bodies. | • All polygons not rated High or Moderate |
| n/a | None | |

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**Shoreline/Stream Bank Stabilization**

*The Shoreline Stabilization function focuses on erosion from wave action and cutting by stream currents. Vegetation and width of the flanking wetland are primary characteristics for a high rating, as is the size of a water body. Shoreline vegetation is an important characteristic for areas with high functionality. Ponds (because of their smaller size compared to lakes) and their associated wetlands offer moderate functionality, as do wetlands that are too narrow to provide a high functional level. Wetlands that emphasize outflow (e.g., headwater-position wetlands) provide this function at a moderate level. Island wetlands provide low functionality, as do ephemeral and intermittent streams. If a wetland is not associated with flowing water or open water areas, this function does not apply.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • Vegetated wetlands along water bodies (excluding Ponds and Island wetlands) where:<br>○ STBL_H1: >=20 ft width of vegetated palustrine wetlands (e.g., AB, EM, SS, FO and mixes) adjacent to open water in Lake<br>○ STBL_H2: >=10 ft of vegetated palustrine wetland (e.g., AB, EM, SS, FO, and mixes) along open water of Stream or River | • Wetlands only; boundary touches polygon with Waterbody Type = LK, RV, or ST; NOT Landform = IL:<br>○ Landscape Position = LE; NWI System = P; NWI Classes UB, US or other modifier = tg excluded; majority of polygon extends outside of 20 ft Lake buffer<br>○ Landscape Position = LS or LR; NWI system = P; NWI Classes UB, US or other modifier = tg excluded; majority of polygon extends outside of 10 ft stream buffer |
| Moderate | • Vegetated wetlands along water bodies (excluding Island wetlands) where:<br>○ STBL_M1: >=10 ft width (but <20 ft) of vegetated palustrine wetlands (e.g., AB, EM, SS, FO and mixes) adjacent to open water in Lake<br>○ STBL_M2: <10 ft of vegetated palustrine wetland (e.g., AB, EM, SS, FO, and mixes) along open water of Stream or River<br>• STBL_M3: Vegetated wetlands along Ponds, excluding Island, farmed, and turfgrass wetlands<br>• STBL_M4: Headwater-position wetlands that are Terrene Outflow, Outflow Intermittent, and Outflow Artificial | • Wetlands only; boundary touches polygon with Waterbody Type = LK, RV, or ST; NOT Landform = IL:<br>○ Landscape Position = LE; NWI System = P; NWI Classes UB, US or other modifier = tg excluded; majority of polygon extends outside of 10 ft Lake buffer, not rated High<br>○ Landscape Position = LS or LR; NWI system = P; NWI Classes UB, US or other modifier tg excluded; Not rated High<br>• Wetlands only, adjacent to polygon with Waterbody Type = PD; AND NOT Landform = IL, NWI modifier = f, or other modifier = tg<br>• Wetlands only; adjacent to polygon with Waterbody Type = ST AND Waterbody Type Modifier = 1 or 1x; Landscape Position = TE AND Water Flow Path = OI, OU or OA AND other modifier = hw |
| Low | • STBL_L1: Island wetlands<br>• STBL_L2: Remaining wetlands along water bodies<br>• *STBL_L3*: Ephemeral and intermittent Streams | • Landform = IL<br>• Wetlands only; adjacent to polygon with Waterbody Type/Wetland = WB AND not rated High or Moderate<br>• Waterbody Type = ST AND NWI Class = R4SB |
| n/a | • STBL_NA: All remaining wetlands and water bodies | • All remaining polygons |

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**Stream Baseflow Maintenance**

*Stream baseflow maintenance relates to the ability of a wetland or water body to source water that sustains base flow levels in streams. This function is especially critical during dry periods and is an important aspect in supporting aquatic life. As such, this function correlates with the native fish habitat function. Headwater wetlands and other wetlands that discharge ground water rate high for this function so long as they have not been modified by ditching, channelization, or drainage. Slope wetlands within 50 feet of rivers or streams and streamside wetlands that are flooded seasonally or longer also function at a high level, as do throughflow (or outflow) lakes that have permanent hydrologic connection to perennial streams. Slope wetlands within 100 feet of streams or rivers function at a moderate level, as do ditched or drained headwater wetlands, streamside wetlands with drier water regimes, and ponds connected to a perennial stream. Riverine wetlands function at a low level because river flow is not dominated by baseflow from those wetlands. Rivers and streams themselves do not provide this function nor do isolated wetlands.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • BASE_H1: Headwater wetlands (excluding ditched/ drained)<br>• BASE_H2: Slope wetlands within 50 ft of Rivers/Streams or Lotic wetlands<br>• BASE_H3: Lotic stream wetlands flooded seasonally or for longer durations (NWI Water Regime = C through H)<br>• *BASE_H4*: Throughflow & Outflow Lakes (no intermittent types) with a permanent hydrologic connection to a perennial Stream | • Wetlands only; other modifier = hw; NOT other modifier = ch, dr or NWI Modifier = d<br>• Wetlands only; Landform = SL AND within 50 ft of RV/ST water body or lotic wetland<br>• Wetlands only; Landscape Position = LS AND NWI regime C, D, E, F, G, or H<br>• Waterbody Type = LK AND Water Flow Path = BO, TA, TB, TH, OA or OU; excluding Great Lakes Coastal types (Lake Michigan) |
| Moderate | • **BASE_M1**: Headwater wetlands that are ditched/drained<br>• BASE_M2: Lotic Stream wetlands (NWI Water Regime A/B/J)<br>• *BASE_M3*: Throughflow & Outflow Ponds (no intermittent types) with a permanent hydrologic connection to a perennial stream<br>• BASE_M4: Slope wetlands within 100 ft of Rivers/ Streams or lotic wetlands AND not rated High | • Wetlands only; other modifier = hw AND other modifier = ch, dr or NWI Modifier = d<br>• Wetlands only; Landscape Position = LS AND NWI regime A, B, or J<br>• Waterbody Type = PD AND Water Flow Path = TH, TI, OU, or OI<br>• Landform = SL AND polygon <100 ft of RV/ST water body OR LS/LR wetland AND polygon is NOT rated High |
| Low | • BASE_L1: Lotic River wetlands<br>• BASE_L2: Outflow & throughflow Lakes, Ponds, and wetlands (headwaters excluded) that are connected naturally or via stormsewer piping to a stream system, including intermittent types<br>• **BASE L3**: Remaining wetlands contiguous to streams | • Wetlands only; Landscape Position = LR<br>• Landscape Position = TE AND Water Flow Path = TH, TI, OU, or OI AND touches stream or stormsewer<br>• Wetlands only; polygon touches stream polygon |
| n/a | • BASE_NA: Rivers, Streams, and remaining water bodies and wetlands, including all isolated wetlands | • Waterbody Type = RV or ST OR WL/WB = WL AND Water Flow Path = IS, IO, II, IT, IN |

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**Stream Shading**

*High vegetation along streams and rivers can provide shading, which helps regulate the water temperature. Cooler water temperatures decrease the solubility of many chemicals, which reduces the toxic stress on aquatic organisms. Temperature regulation also increases the significance of the fish and amphibian habitat wetland functions. Forested or scrub-shrub headwater wetlands and forested wetlands adjacent to streams and rivers provide this function at the highest level.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • SHAD_H1: Headwater wetlands that are forested or scrub-shrub<br>• SHAD_H2: Forested wetlands within 50 ft of Streams and Rivers | • Wetlands only; NWI class = FO, SS or FO/SS AND other modifier = hw<br>• Wetlands only; NWI Class = FO AND polygon occurs within 50 ft of polygon with Waterbody = LS or LR AND NWI Modifier is NOT = f or other modifier is NOT = ag |
| Moderate | • SHAD_M1: Scrub-shrub wetlands or Forested mixes not rated High within 50 ft of Streams and Rivers | • Wetlands only; NWI Class = SS OR FO mix AND not rated High AND polygon is within 50 ft of polygon with Waterbody = LS or LR AND NWI Modifier is NOT = f or other modifier is NOT = ag |
| Low | • SHAD_L1: Emergent (persistent vegetation) or Emergent/Scrub-shrub wetlands within 50 ft of Streams and Rivers | • Wetlands only; NWI Class = EM OR EM/SS AND polygon is within 50 ft of polygon with Waterbody = LS or LR AND NWI Modifier is NOT = f or other modifier is NOT = ag |
| n/a | • SHAD_NA: All remaining polygons | • All polygons not rated High, Moderate, or Low |

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**Unique Wetland Resources**

*The wetlands and water bodies identified in this category are considered unique on a global, state or local level. They perform biological and/or stormwater management functions at an exceptional level. Many of these wetlands contain a wide variety of fauna and flora, including threatened or endangered species in some locations. Other wetlands and water bodies included in this category provide important flood water storage and water quality treatment functions (i.e. nutrient retention and transformation) at a very high level based on their size and geomorphology. The Lake Michigan water body is not included in the High category.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • **UNIQ_H1**: Wetlands of international importance (RAMSAR designation – e.g., Chiwaukee Prairie)<br>• **UNIQ_H2**: Wetlands/water bodies identified as having significant biological and/or stormwater management functions in the Lake County, IL Advance Identification (ADID) study (NIPC, et al 1992), excluding detention basins<br>• **UNIQ_H3**: Wetlands in designated Illinois Natural Area Inventory Sites<br>• UNIQ_H4: Bogs (e.g., Volo Bog)<br>• UNIQ_H5: Ephemeral (vernal) pools<br>• UNIQ_H6: Hillside seeps associated with ravine features (Slope wetlands)<br>• UNIQ_H7: Lake Michigan coastal wetlands, including dune-swale complex and beach habitat<br>• ***UNIQ_H8***: Constructed wetland mitigation bank sites (permitted by Army Corps or SMC) | • Wetlands only; polygon(s) intersect with RAMSAR-designated boundary<br>• Polygon intersects ADID boundary; AND centroid is within ADID polygon OR 0.25 acres of ADID are within polygon; AND Waterbody is NOT = 2c1, 2d1, 2e1, 3c1, 3d1, or 3e1<br>• Polygon intersects INAI boundary AND a significant portion lies within INAI polygon<br>• Other modifier = bg<br>• Other modifier = wv<br>• Wetlands only; Landform = SL AND NWI Water Regime = B or D AND polygon is adjacent to ravine<br>• Wetlands only; other modifier = gl<br>• Other modifier = mi |
| Moderate | - | |
| Low | - | |
| n/a | • UNIQ_NA: All wetlands and water bodies not rated High | • All remaining polygons not rated High |

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**Waterfowl Habitat**

*Wetlands designated as important for waterfowl (e.g., ducks, geese, swans) are generally those used for nesting, feeding or reproduction. The emphasis is on wetlands that are frequently flooded for long periods. Emergent wetlands are rated as high functionality, based on the wide diversity of waterfowl species that inhabit this wetland class, while forested and scrub-shrub wetlands are rated as moderate functionality due to less waterfowl diversity (e.g., emphasis on wood duck habitat). Open water zones of natural lakes and ponds and larger streams and rivers are also rated high for providing landing/rafting areas and habitat for diving species.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • FOWL_H1: Aquatic beds; excluding detention basins<br>• FOWL_H2: Emergent wetlands that are semi-permanently, permanently flooded, or intermittently exposed; excluding farmed wetlands<br>• FOWL _H3: Emergent wetlands that are seasonally flooded and contiguous to a water body, excluding farmed wetlands<br>• FOWL_H4: Island wetlands with emergent vegetation<br>• *FOWL_H5*: Natural Lakes and Ponds (open water zone)<br>• *FOWL_H6*: Rivers (open water zone) | • NWI Class = AB or mix with AB predominant (e.g., AB/UB); Waterbody Modifier is NOT= 2c1, 2d1, 2e1, 3c1, 3d1, or 3e1<br>• Wetlands only, NWI Class = EM or mix with EM predominant AND NWI Water Regime = F, G, or H; NOT other modifier = ag or NWI modifier = f<br>• Wetlands only, NWI Class = EM AND NWI Water Regime = C; NOT other modifier = ag or NWI modifier = f<br>• Landform = IL AND NWI Class = EM or mix with EM predominant<br>• Waterbody Type = LK AND Waterbody Modifier = 1x or 3a OR Waterbody Type = PD AND Waterbody Modifier = 1x or 4<br>• Waterbody Type = RV |
| Moderate | • FOWL_M1: Forested and scrub-shrub wetlands that are seasonally, semi-permanently, intermittently or permanently flooded, or intermittently exposed; excluding farmed wetlands and terrene flat (outside floodplain)<br>• FOWL_M2: Emergent wetlands that are seasonally flooded, continuously saturated, seasonally flooded/saturated, or intermittently flooded, excluding farmed wetlands<br>• ***FOWL_M3***: Artificial Lakes and Ponds<br>• *FOWL_M4*: Perennial and Intermittent Streams (open water zone)<br>• FOWL_M5: Emergent wetlands that are temporarily flooded and are within FEMA 100 yr floodplain | • NWI Class = FO or SS1 and mixes with FO or SS1 predominant AND NWI Water Regime = C, E, F, G, or H AND other modifier is NOT = ag AND NWI modifier is NOT = f AND Landscape/Landform is NOT = TE-FL<br>• NWI Class = EM AND NWI Water Regime = C, D, E, or J AND other modifier is NOT = ag AND NWI modifier is NOT = f<br>• Waterbody Type = LK AND Water Modifier is NOT = 1x or 3a OR Waterbody Type = PD AND Waterbody Modifier is NOT = 1x<br>• Waterbody Type = ST AND AND NWI Water Regime = C or wetter<br>• Wetlands only, NWI Class = EM AND NWI Water Regime = A AND majority of polygon within FEMA 100 yr floodplain |
| Low | • FOWL_L1: All remaining wetlands except Slope wetlands<br>• *FOWL_L2*: Ephemeral Streams | • Wetlands only, Landform is NOT= SL AND not rated High or Moderate<br>• Waterbody = ST AND NWI Water Regime = A |

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| n/a | • FOWL_NA: Slope wetlands not rated High or Moderate (i.e., Slope wetlands that are not seasonally flooded or wetter) | • Landform = SL AND not rated High or Moderate |

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**Wetland-Dependent Bird Habitat (Other)**

This function attempts to capture the wetland types and water bodies that provide desired habitat for a variety of wading birds, shorebirds and songbirds (e.g., herons, bitterns, plovers, sandpipers, red-winged and yellow-headed blackbirds). Aquatic beds, island wetlands, and emergent and scrub-shrub wetlands that are seasonally to semi-permanently flooded or are intermittently exposed/flooded or are continuously saturated provide this function at a high level for a wide diversity of bird species that nest, feed and reproduce in these wetland types. Natural ponds that are intermittently exposed and unconsolidated shorelines along natural lakes, ponds and streams/rivers also provide this function at a high level for many shorebirds. The coastal wetlands along Lake Michigan also rate high for this function as they provide valuable habitat for a wide diversity of wading birds, shorebirds and songbirds. Forested wetlands provide more limited habitat for the array of wetland-dependent birds considered and therefore have low significance for this function.

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • BIRD_H1: Emergent and scrub-shrub wetlands that are seasonally, intermittently or semi-permanently flooded, or intermittently exposed/flooded or continuously saturated; excluding farmed wetlands<br>• BIRD_H2: Island wetlands<br>• *BIRD_H3*: Natural Ponds that are intermittently exposed<br>• BIRD_H4: Unconsolidated shorelines associated with natural Lakes, Ponds and Streams/Rivers<br>• BIRD_H5: Lake Michigan coastal wetlands, including dune-swale complex | • Wetlands only; NWI Class = EM, SS or EM/SS AND NWI Water Regime = C, D, E, F, G, or J AND other modifier is NOT = ag AND NWI Modifier is NOT = f<br>• Landform = IL<br>• Waterbody Type = PD AND Waterbody Modifier = 1x AND NWI Water Regime = G<br>• Wetlands only; NWI Class = US AND Lentic Type = 1x or 3a OR Lotic Gradient is NOT = 6x or 7<br>• Wetlands only; other modifier = gl AND NWI subsystem = L2US OR NWI Class = PEM, PSS1 OR PFO1 AND NWI Water Regime= C, D, E, F, G, or J |
| Moderate | • BIRD_M1: Emergent and scrub-shrub wetlands that are temporarily flooded; excluding farmed wetlands<br>• ***BIRD_M2***: Artificial Ponds that are intermittently exposed<br>• **BIRD_M3**: Unconsolidated shorelines associated with artificial Lakes and Ponds and channelized Streams | • Wetlands only; NWI Class = EM, SS or EM/SS AND NWI Water Regime = A AND other modifier is NOT = ag AND NWI Modifier is NOT = f<br>• Waterbody Type = PD AND Waterbody Modifier is NOT = 1x AND NWI Water Regime = G<br>• Wetlands only; NWI Class – US AND Lentic Type is NOT = 1x or 3a OR Lotic Gradient = 6x or 7 |
| Low | • BIRD_L1: All remaining wetlands<br>• *BIRD_L2*: All polygons classified as Ponds (e.g., detention basins and bermed impoundments) not rated High or Moderate<br>• *BIRD_L3*: Ephemeral and intermittent Streams<br>• BIRD_L4: All remaining Aquatic Beds, including mixes | • Wetlands only; AND not rated High or Moderate<br>• Waterbody Type = PD AND not rated High or Moderate<br>• Waterbody type = ST AND NWI Class = R4SB<br>• NWI Class = AB or AB mix AND not rated High or Moderate |
| n/a | • *BIRD_NA*: Open water zone of Lakes, Ponds, Rivers, and perennial Streams | • Water bodies not rated High, Moderate, or Low |

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**Wildlife Movement Corridors**

*This function emphasizes connectivity that enables movement of mammals, birds, and insects between wetland environments, so accessibility and proximity are key. Vegetated corridors increase a wetland's ability to provide habitat because a larger pool of species can access and use the wetland. Such corridors include upland connections capable of providing refuge, food, and migration for a variety of species as well as artificial connections such as excavated ditches. All wetlands offer this function to some degree; however, wetlands that are interlinked to other wetlands or to sizeable upland habitats via broad, relatively uninterrupted vegetated corridors rate highest. Areas that rate moderate include wetlands with narrower or more interrupted connections and wetlands that lack a physical corridor connection but have other aquatic resources or a sizeable upland habitat nearby.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) | Comments |
|---|---|---|---|
| High | • MOVE_H1: Vegetated wetlands (except Aquatic Bed) that connect to other wetlands via a broad and relatively unbroken vegetated corridor<br>• **MOVE_H2**: Vegetated wetlands (except Aquatic Bed) that connect to a large, naturalized upland area via a broad and relatively unbroken vegetated corridor | • Wetlands only; NWI Class = FO, SS, EM wetlands or mixes with only these classes AND intersects Vegetated Corridor Polygon H1 AND NOT Landform = IL or Landform Modifier = il<br>• Wetlands only; NWI Class = FO, SS, EM wetlands or mixes with only these classes AND intersects Vegetated Corridor Polygon H2 AND NOT Landform = IL or Landform Modifier = il | Vegetated Corridor Polygon H1: Vegetated open space, 200 ft+ wide, 2 or less interruptions* and intersects at least 2 vegetated wetlands (FO, SS, EM, & mixes of those)<br>Vegetated Corridor Polygon H2: Vegetated open space, 200 ft+ wide, 2 or less interruptions and intersects at least one vegetated wetland (FO, SS, EM & mixes of those) AND one 25+ acre naturalized upland<br>Naturalized Upland Polygon: 25+ contiguous acres, does not include manicured or agricultural open space |
| Moderate | • MOVE_M1: Aquatic Beds that connect to other wetlands via a broad and relatively unbroken vegetated corridor<br>• **MOVE_M2**: Vegetated wetlands that connect to other wetlands or a large, naturalized upland via a narrower and/or interrupted vegetated corridor and not rated High<br>• **MOVE_M3**: Vegetated wetlands and Aquatic Beds connected to other vegetated wetlands or Aquatic Beds by a non-vegetated wetland or water body | • NWI Class = AB and AB/vegetated mixes (no UB, US, SB or RB mixes) AND intersects Vegetated Corridor Polygon M1 AND NOT Landform = IL or Landform Modifier = il<br>• NWI Class = FO, SS, EM, AB and mixes of these classes AND intersects Vegetated Corridor Polygon M2 AND not rated High AND NOT Landform = IL or Landform Modifier = il<br>• NWI Class = FO, SS, EM, AB and mixes of these classes AND intersects Water Corridor Polygon AND not rated High AND NOT Landform = IL or Landform Modifier = il | Vegetated Corridor Polygon M1: Vegetated open space, 200 ft+ wide, 2 or less interruptions and intersects at least one vegetated wetland (FO, SS, EM, & mixes of those) AND one aquatic bed (AB or AB/vegetated mix)<br>Vegetated Corridor Polygon M2: Vegetated open space, 50 ft+ wide, 4 or less interruptions and intersects at least 1 vegetated wetland (FO, SS, EM, & mixes of those) AND one of the following: another vegetated wetland, an aquatic bed (AB or AB/vegetated mix), or a Naturalized Upland Polygon |

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| | | | |
|---|---|---|---|
| | • **MOVE_M4**: Vegetated wetlands and Aquatic Beds that lack connections near other aquatic resources or sizeable naturalized upland<br>• *MOVE_M5*: Intermittent and ephemeral Streams | • NWI Class = FO, SS, EM, AB and mixes of these classes AND within 500 ft of wetlands OR water bodies OR Naturalized Upland Polygon AND NOT Landform = IL or Landform Modifier = il AND NOT rated High<br>• WB = ST4 AND NWI Class = R4SBA or R4SBC | Water Corridor Polygon: Hydro lines and Water bodies that intersect or touch any combination of vegetated wetland and aquatic bed (and mixes of these classes) |
| Low | • MOVE_L1: All Island wetlands (must be rated Low)<br>• MOVE_L2: All remaining wetlands and waters, including Lakes, Rivers, and remaining Streams | • Wetlands only, Landform = IL, supersedes previous High or Moderate rating<br>• All remaining polygons not rated High or Moderate | |
| N/A | none | | |

*** Interruption: 30 ft wide or less (e.g., 2-lane roadway and shoulder). Anything wider is considered a "break" and shall be a separate corridor/polygon.**

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**Woodland Amphibian Habitat**

*This function assesses a wetland's suitability to provide breeding habitat for woodland amphibians (e.g., spotted salamanders, wood frog). In general, ratings are based on wetland size, wetland type, presence/absence of predators, and proximity to other wetlands on the local landscape. Note: This function does not focus on the importance of a wetland to a specific species (including threatened or endangered species) nor does it predict habitat suitability accurately for every woodland amphibian species.*

| Functional Significance | Code Symbol/Criteria | GIS-Based W-PAWF Selection Attributes (NWI, LLWW) |
|---|---|---|
| High | • AMPH_H1: Woodland vernal pools less than 2 acres that lack fish habitat and within 500 ft of other wetlands/water bodies<br>• AMPH_H2: Flatwoods that are seasonally to semi-permanently flooded and lack fish habitat<br>• *AMPH_H3*: Ponds less than 2 acres that lack fish habitat and within 500 ft of other wetlands that are associated with woodlands | • Wetlands only, size <2 acres AND <=500 ft of other wetland/water body AND NWI Class = PFO AND NWI Water Regime = C, E, or F AND Landform = BA AND other modifier = wv AND Water Flow Path = IS, OU, TI, or OI AND FISH=N/A or Low<br>• Wetlands only, other modifier = fd AND Landform = FL and NWI Class = PFO AND NWI Water Regime = C, E, or F AND FISH = N/A or Low<br>• WB = PD AND size <2 acres AND <=500 ft from other wetland/water body AND NWI Water Regime = C, E, or F AND Flow Path = IS, II, IN, IO, OA, OU, OI, or TI AND FISH = N/A or Low AND polygon is within 10 ft of woodland (from LC Land Use Layer) |
| Moderate | • AMPH_M1: Woodland vernal pools 2 acres or larger within 500 ft of other wetlands; AND lacks good fish habitat<br>• AMPH_M2: Woodland vernal pools less than 2 acres and more than 500 ft from other wetlands; AND lacks good fish habitat<br>• AMPH_M3: Flatwoods that are seasonally to semi-permanently flooded with Moderate fish habitat<br>• *AMPH_M4*: Seasonally to semi-permanently flooded Ponds that are associated with woodlands and have Moderate fish habitat<br>• AMPH_M5: Wetlands not rated High for fish; and are contiguous to wetlands and waters rated High for amphibians<br>• *AMPH_M6*: Intermittent woodland Streams that are contiguous to polygons rated High or Moderate for amphibians | • Wetlands only, size >=2 acres AND <=500 ft of other wetland/water body AND NWI Class = PFO AND NWI Water Regime = C, E, or F AND Landform = BA AND other modifier = wv AND Water Flow Path = IS, OU, TI, or OI AND FISH is NOT high<br>• Wetlands only, size <2 acres AND >500 ft of other wetland/water body AND NWI Class = PFO AND NWI Water Regime = C, E, or F AND Landform = BA AND other modifier = wv AND Water Flow Path = IS, OU, TI, or OI AND FISH is NOT high<br>• Wetlands only, other modifier = fd AND Landform = FL and NWI Class = PFO AND NWI Water Regime = C, E, or F AND FISH = Moderate<br>• WB = PD AND NWI Water Regime = C, E, or F AND Flow Path = IS, OU, OI, or TI AND FISH = Moderate AND polygon is within 10 ft of woodland (from LC Land Use Layer)<br>• Wetlands only, FISH is NOT High AND polygon touches polygon rated High for Amphibians<br>• WB= ST and NWI Class = R4SBC AND polygon touches polygon rated High or Moderate for amphibians |
| Low | • AMPH_L1: All remaining forested and scrub-shrub wetlands and mixes with forested or scrub-shrub, and not rated High for fish<br>• *AMPH_L2*: All remaining woodland Ponds not rated High for fish | • Wetlands only, NWI Class = FO, SS, FO/SS, EM/FO, or EM/SS AND FISH is NOT High<br>• WB = PD, AND FISH is NOT High AND polygon is within 10 ft of woodland (from LC Land Use Layer) AND not rated High or Moderate |

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| | | |
|---|---|---|
| N/A | • AMPH_NA: Any polygon rated High for fish and all other remaining wetlands and waters | • Fish habitat = High OR not rated High, Moderate, or Low |

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# APPENDIX A.6

## PRW DEVELOPMENT

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# APPENDIX A.6 PRW DEVELOPMENT

## INTRODUCTION

A large component of Lake County Stormwater Management Commission's (SMC) Wetland Restoration and Preservation Plan (WRAPP) development entailed the identification, classification and assessment of potentially restorable wetland (PRW) areas in Lake County, Illinois. We developed the PRW geographic database using the Existing Wetland Inventory (EWI-LC) and the Historic Wetland Inventory (HWI-LC) databases (see **Appendices A.1** and **A.2**). The three WRAPP databases (PRW, EWI-LC, and HWI-LC) are founded on the Lake County Wetlands Inventory (LCWI), a data set developed by the Federal Wetlands Committee and maintained by the Lake County GIS Division.

This appendix discusses the steps SMC undertook to develop the database of PRW polygons and to append National Wetland Inventory (NWI) classification codes and Landscape Position, Landform, Water Flowpath, and Waterbody (LLWW) descriptors to those polygons. Appending that information enabled SMC to ultimately perform a functional assessment of the PRW data set using a "desktop" GIS analysis supported and informed by field data. To provide the most accurate and precise data possible, SMC modified and enhanced, but did not replace, the current LCWI geodatabase. Importantly, we do not intend the WRAPP data sets to replace or update the LCWI for Lake County, Illinois.

## PRW DEVELOPMENT

The following steps describe development of the PRW polygon database as well as the process and rationale by which SMC assigned the NWI and LLWW descriptors and codes. See **Appendixes A.3** and **A.4** for additional details on the LLWW and NWI classification process.

### *Creation of Potentially Restorable Wetland Polygons*

1) SMC removed areas within the EWI-LC polygons from the HWI-LC polygon areas. The remaining polygon areas represented the portions of the estimated historic wetlands that are not currently identified as wetlands or water (within the EWI-LC). This was the initial "working" PRW database.
2) SMC added farmed wetlands from the EWI (NWI special modifier = "f" and/or LLWW other modifier = "ag") to the working PRW database (they were removed in Step 1).
3) SMC removed all remaining water bodies from the working PRW database.
4) We used the Lake County "Edge of Pavement" (2011) geodatabase to remove paved areas from the working PRW database. This data represents paved and unpaved roads and alleys, bridges, airport runways, and paved parking lots digitized from 2002, 2010, and 2011 aerial photography.
5) We identified land uses from the Lake County "2010 Land Use/Land Cover" geodatabase that could be suitable for wetland restoration sites. We then removed land uses associated with urban, built up land (e.g., residential, commercial, industrial, etc.) but added back in a limited number of such sites based on an extensive quality check of the land use selections. The Lake County dataset also includes land cover subcategories that apply to the main land use/land cover designation for a polygon. We also used these to refine the PRW area selection. **Table A.6.1** identifies the Land Use/Land Cover categories and subcategories that we used to filter PRW

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areas. The table shows the total number of PRW polygons and Total PRW acres for each category to provide context for which categories have the greatest concentration of PRW acres.

6) SMC reduced the working PRW polygons to areas within the Lake County 2010 Land Use/Land Cover polygons identified in Step 5 and **Table A.6.1**.
7) SMC identified buildings greater than 500 square feet and within 25 feet of PRW polygons using the Lake County "Buildings" planimetric geodatabase. This data includes the outline of buildings digitized from aerial photography in 2002, 2004, and 2010 and includes buildings larger than 100 square feet. We then buffered the selected buildings by 20 feet and removed any PRW areas within this buffer from the working database. This constituted the final draft geography of the PRW database, except for minor changes made during the QA/QC review.

### *Classification of Potentially Restorable Wetland Polygons*

8) SMC transferred LLWW and NWI codes from adjacent (touching) EWI-LC polygons to PRW polygons if both the EWI-LC and PRW polygons were part (to a significant extent) of the same HWI-LC polygon.
9) If the condition in Step 8 was not satisfied, SMC assigned the code from the underlying HWI-LC polygon to the PRW polygon.
10) If SMC assigned the code based on Step 9, we reviewed the HWI-LC codes for polygons that, if restored, would have LLWW and NWI codes indicating human modification (see **Appendices A.3** and **A.4**). We reviewed and coded PRW polygons subject to drainage/ditching, those along ditches, and those adjacent to impounded or excavated lakes as applicable.

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**Table A.6.1. Summary of Lake County 2010 Land Use/Land Cover Categories and Land Cover Subcategories Used to Identify PRW Polygons.**

| Lake County 2010 Land Use/Land Cover Category | Applicable Land Cover Subcategories | Estimated PRW | |
|---|---|---|---|
| | | Polygons | Acres |
| Single Family Detached | | 23 | 2 |
| Age Restricted Townhouse and Duplexes | | 1 | <1 |
| Farmhouse | | 3 | <1 |
| Cultural, Entertainment | Grasslands | 4 | 6 |
| Educational Facilities | Automobile Parking | 29 | 48 |
| Government | Automobile Parking | 2 | 1 |
| Religious Facilities | | 2 | 1 |
| Other Institutional | Forest Lands; Wetlands; Grasslands | 6 | 3 |
| Manufacturing and Processing | | 1 | <1 |
| Industrial Park | | 1 | <1 |
| Public Roadway | Rights-of-Way Occupied by Transportation Related Uses | 21 | <1 |
| Interstate and Toll Way | | 1 | <1 |
| Private Roadway | | 17 | 1 |
| Airport Transportation | Wetlands; Intermediate Vegetation | 3 | 5 |
| Utilities and Waste Facilities | Single Family Detached; Rights-of-Way Occupied by Non-Transportation Related Uses; Cropland; Orchards, Vineyards, Nurseries and Horticultural Areas; Golf Course; Other Open Space; Recreational Trail; Forest Lands; Wetlands; Wetlands/Agricultural; Grasslands; Intermediate Vegetation | 453 | 266 |
| Railroad Right-of-way | Wetlands | 8 | 1 |
| Cropland | Other Institutional; Rights-of-Way Occupied by Non-Transportation Related Uses; Cropland; Wetlands/Agricultural | 871 | 4,031 |
| Equestrian Cropland | Wetlands/Agricultural | 45 | 85 |
| Orchards, Vineyards, Nurseries and Horticultural Areas | Wetlands/Agricultural | 137 | 326 |
| Non-Equestrian Facilities | | 1 | 1 |
| Equestrian Facilities | | 5 | 4 |
| Pasture | Rights-of-Way Occupied by Non-Transportation Related Uses | 18 | 11 |
| Equestrian Pasture | Rights-of-Way Occupied by Non-Transportation Related Uses; Wetlands/Agricultural | 258 | 344 |
| Parks, Arboretums, and Botanical Gardens | Government; Rights-of-Way Occupied by Non-Transportation Related Uses; Automobile Parking; Golf Course; Other Open Space; Forest Lands; Wetlands; Wetlands/Agricultural; Grasslands; Intermediate Vegetation; Sand Beach; Non-Residential Under Development | 653 | 886 |
| Golf Course | Rights-of-Way Occupied by Non-Transportation Related Uses; Forest Lands; Wetlands; Grasslands; Intermediate Vegetation | 475 | 1,991 |
| Other Open Space | Rights-of-Way Occupied by Non-Transportation Related Uses; Cropland; Equestrian Cropland; Orchards, Vineyards, Nurseries and Horticultural Areas; Equestrian Pasture; Groomed Subdivision and Commercial Set Asides; Forest Lands; Wetlands; Wetlands/Agricultural; Grasslands; Intermediate Vegetation | 130 | 102 |
| Groomed Subdivision and Commercial Set Asides | Automobile Parking; Forest Lands; Wetlands; Grasslands; Intermediate Vegetation; Sand Beach | 215 | 115 |

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| Lake County 2010 Land Use/Land Cover Category | Applicable Land Cover Subcategories | Total PRW | |
|---|---|---|---|
| | | Polygons | Acres |
| Recreational Trail | Wetlands | 24 | 5 |
| Parks, Arboretums, Botanical Gardens, and Forest Preserves | Single Family Detached; Farmhouse; Rights-of-Way Occupied by Non-Transportation Related Uses; Automobile Parking; Cropland; Equestrian Cropland; Orchards, Vineyards, Nurseries and Horticultural Areas; Non-Equestrian Facilities; Equestrian Facilities; Pasture; Equestrian Pasture; Golf Course; Other Open Space; Groomed Subdivision and Commercial Set Asides; Recreational Trail; Forest Lands; Wetlands; Wetlands/Agricultural; Grasslands; Intermediate Vegetation; Sand Beach; Residential Under Development; Non-Residential Under Development; Rivers, Streams and Canals; Lakes, Reservoirs and Lagoons | 1,904 | 1,772 |
| Primarily Conservation - Groomed Subdivision and Commercial Set Asides | Single Family Detached; Rights-of-Way Occupied by Non-Transportation Related Uses; Cropland; Forest Lands; Wetlands; Grasslands; Intermediate Vegetation | 683 | 244 |
| Primarily Stormwater Management | Forest Lands; Wetlands; Grasslands | 4 | 1 |
| Forest Lands | Rights-of-Way Occupied by Non-Transportation Related Uses; Airport Transportation | 1,370 | 362 |
| Wetlands | Rights-of-Way Occupied by Non-Transportation Related Uses; Airport Transportation; Railroad Right-of-Way | 3,629 | 1,318 |
| Wetlands/Agricultural | Rights-of-Way Occupied by Non-Transportation Related Uses | 661 | 514 |
| Grasslands | Rights-of-Way Occupied by Non-Transportation Related Uses; Airport Transportation | 2,618 | 1,824 |
| Intermediate Vegetation | Rights-of-Way Occupied by Non-Transportation Related Uses; Airport Transportation | 1,796 | 631 |
| Sand Beach | | 1 | <1 |
| Non-Residential Under Development | Wetlands | 2 | 7 |
| Other Vacant Land Available for Redevelopment | | 1 | <1 |
| Rivers, Streams and Canals | Rights-of-Way Occupied by Non-Transportation Related Uses; Cropland; Parks, Arboretums, Botanical Gardens, and Forest Preserves | 263 | 5 |
| Lakes, Reservoirs and Lagoons | Rights-of-Way Occupied by Non-Transportation Related Uses; Golf Course; Parks, Arboretums, Botanical Gardens, and Forest Preserves; Wetlands; Grasslands; Intermediate Vegetation | 1,058 | 61 |

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# APPENDIX B

## *FIELD STUDIES*

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# APPENDIX B.1

## WETLAND FIELD CHECK DATA FORM

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**Wetland Field Check Data Form**

# Wetland Restoration & Preservation Plan (WRAPP) (6/15/16)

## 1: General Information

**Watershed:** **Sub-watershed:** **Wetland ID:**

**Date:** **Assessed By:** **GIS/Photo ID #:**

Lat: ° Long: ° Location:

Slope:

Weather Conditions:

Recent (24 hr) Precipitation:

☐ Designated as HQAR or ADID?

**Cowardin Classification:**

**LLWW Classification:**

Landscape Position: Landform:

Water Flow Path: Water Body:

**Reference Maps:** ☐ LCWIe ☐ FEMA ☐ Soils ☐ ADID ☐ Topo ☐ Aerials ☐ Other:

## 2. Mapping Review/Verification of GIS

☐ Wetland/water body is present and boundary generally matches LCWIe

☐ Wetland/water body is present, but mapped location differs from LCWIe (see field mark-up for revised boundary)

☐ Wetland does NOT appear to be present in mapped location – remove from LCWIe

☐ Mineral soil verified ☐ Organic soil verified

**For wetlands/ water bodies confirmed as present:**

Cowardin classification from NWI/LCWIe confirmed?

☐ Yes ☐ No

If NO, recommended changes based on observations:

LLWW classification from LCWIe confirmed?

☐ Yes ☐ No

If NO, recommended changes based on observations:

## 3. Field Observations (check all that apply)

| Hydrology: Source | Surface Connectivity | Indicators |
|---|---|---|
| ☐ Overbank flooding | ☐ Within the FEMA 100-yr floodplain | ☐ Surface water depth (in): |
| ☐ Depressional flooding/ponding | ☐ Within the FEMA 500-yr floodplain | ☐ Water table depth (in): |
| ☐ Groundwater (seeps, high water table) | ☐ Connected by drainage/stream (incl. ephemeral) | ☐ Soil saturation depth (in): |
| ☐ Lake Michigan coastal wetland | ☐ Contiguous/adjacent | ☐ Water marks height (in): |
| ☐ Surface Runoff | ☐ Area discharges to surface water | ☐ Drift deposits |
| ☐ Stormwater outfall | ☐ Headwaters position | ☐ Sediment deposits |
| ☐ Other: | ☐ Channelized flow | ☐ Water-stained leaves |
| | ☐ Non-channelized flow | ☐ Crayfish burrows |
| | | ☐ Other: |

**Wildlife Habitat Features:**

☐ Standing snags >12" dbh

☐ Coarse woody debris (10'+ long, 6"+ diam) on ground

☐ Hummocks/tussocks

☐ Woodland amphibian breeding pools/ nursery

☐ Other wetlands within 500 ft

☐ Beach

☐ Shoreline

☐ Mudflat

**Canopy:**

☐ Most trees <6" dbh or no trees

☐ Most trees between 6-12" dbh, a few >12"

☐ Canopy >6"dbh and many large trees >12" dbh

**Connectivity:**

☐ No connection to other natural area/open space

☐ Connection with natural area/open space of <10 ac

☐ Connection with natural area/open space 11-25 ac

☐ Connection with natural area/open space 25-50 ac

☐ Connection to open space of 51-100 ac

☐ Connection with open space of >100 ac

Connectivity Interruptions:

0-2 ☐ 3-4 ☐ 5+ ☐

☐ 50+ ft-wide corridor connection

☐ 200+ ft-wide corridor connection

Adjacent Land Use:

**Notes:**

**Additional Observations/Remarks:**

Wildlife species (insect, mammal, bird, amphibian), type of observation (scat, direct, track, feather, etc.), other wetlands nearby, hydrologic notes (e.g., flow rate, depth to overtopping channel, average channel width), etc.

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## 3. FIELD OBSERVATIONS, CONTINUED (check all that apply)

| VEGETATION: General | Diversity | Plant Strata |
|---|---|---|
| Main Plant Community: _____<br><br>Secondary Plant Community: _____<br><br>☐ Dense, persistent vegetation<br>☐ Dense, non-persistent vegetation<br>☐ Marsh only:<br><25% cover by vegetation ☐<br>25%+ cover by vegetation ☐<br>☐ Potential for erosion due to wind fetch, pond or open water area (1+ ac)<br>Littoral Zone Wetland Width:<br>☐ <10 ft ☐ 10-20 ft ☐ 20+ ft | ☐ High (<10% cover by non-natives)<br>☐ Low (10-50% cover by non-natives)<br>☐ Dominated by non-natives<br>**DOMINANT PLANT SPECIES:**<br><br>**NOTABLE PLANT SPECIES:**<br><br>☐ Rare plant species known (within past 10 yrs)<br>☐ Rare plant species observed | ☐ Trees (woody, 3"+ dbh)<br>Closed ☐<br>Sparse ☐<br>☐ Sapling/shrub (woody, <3"dbh & >3.3' tall)<br>Dense ☐<br>Sparse ☐<br>☐ Herb (non-woody + woody <3.3' tall)<br>Dense ☐<br>Sparse ☐<br>☐ Graminoids (non-woody, not broadleaf)<br>☐ Vines |

**PERCENT GROUND COVER:**

☐ Very Sparse (0-10%) ☐ Sparse (11-30%) ☐ Mod. Sparse (31-50%) ☐ Moderate (51-70%) ☐ Mod. Dense (71-90%) ☐ Dense (91-100%)

**INTERSPERSION:** Select the figure that best represents the degree of interspersion between vegetation and open water during the growing season. Patterned areas represent vegetated areas and white areas represent open water/aquatic bed.

☐ A ☐ B ☐ C ☐ D

| ALTERATIONS: Evidence of Water Quality Issues | Evidence of Altered Hydrology/Hydrologic Connectivity | Relative Level and Permanence of Disturbance, and Sources | Ground Surface/Vegetation Condition of the Wetland |
|---|---|---|---|
| ☐ Dead fish, amphibians<br>☐ Dredging<br>☐ Odor<br>☐ Point-source discharge (NPDES)<br>☐ Receives agricultural runoff<br>☐ Stormwater inputs<br>☐ Sediment deposits on plants<br>☐ Excess nutrients (algae blooms, macrophytes)<br>☐ Water discoloration (cloudy, oily sheen)<br>☐ Road runoff<br><br>**Notes:** | ☐ Drainage (ditches, tiles)<br>☐ High proportion of open water, dead/dying trees<br>☐ Water control: weirs, dikes, dams, berms<br>☐ Beaver dams<br>☐ Stream channelization<br>☐ Constricted outlet<br>☐ Artificial flooding<br>☐ Overbank flow is NOT severely altered<br>☐ Overbank flow is severely altered<br>☐ Overland flow is severely altered | ☐ Buffer* disturbance<br>☐ Wetland disturbance<br>☐ Recent disturbance (not at equilibrium)<br>☐ Historic disturbance (at equilibrium)<br>*buffer=50' except HQAR=100'<br>**Relative Percent Disturbance:**<br>Buffer / Wetland<br>☐ <5% ☐ <5%<br>☐ 6-25% ☐ 6-25%<br>☐ 26-50% ☐ 26-50%<br>☐ 51-75% ☐ 51-75%<br>☐ 76-95% ☐ 76-95%<br>☐ >95% ☐ >95% | ☐ Filling<br>☐ Grading<br>☐ Plowing, disking, tilling<br>☐ Vehicle tracks, ORVs<br>☐ Herbicide<br>☐ Mowing<br>☐ Soil compaction<br>☐ Intensive grazing, hooved animals<br>☐ Human-induced sedimentation or burial<br>☐ Human-induced erosion or exposure<br>☐ Clear cutting<br>☐ Selective cutting |

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## 4: Checklist for Probable Wetland Functions

Use this table to identify functions associated with the wetland or watershed services relevant to your inventory or mapping effort and record appropriate information.

| | Function | Ability to Perform Function (H, M, L, or n/a) | Field Observations to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations |
|---|---|---|---|---|
| Hydrologic | Flood water storage/surface detention | | | |
| | Stream baseflow maintenance | | | |
| Biodiversity | Native fish habitat | | | |
| | Waterfowl habitat | | | |
| | Other wetland-dependent bird habitat | | | |
| | Woodland amphibian habitat | | | |
| | Unique wetland resources | | | |
| | Stream Shading | | | |
| | Wildlife Movement Corridor (Riparian Habitat) | | | |
| Water Quality | Nutrient Transformation (Phosphorus) | | | |
| | Sediment and other particulate retention | | | |
| | Shoreline/streambank stabilization | | | |
| | Carbon Sequestration | | | |

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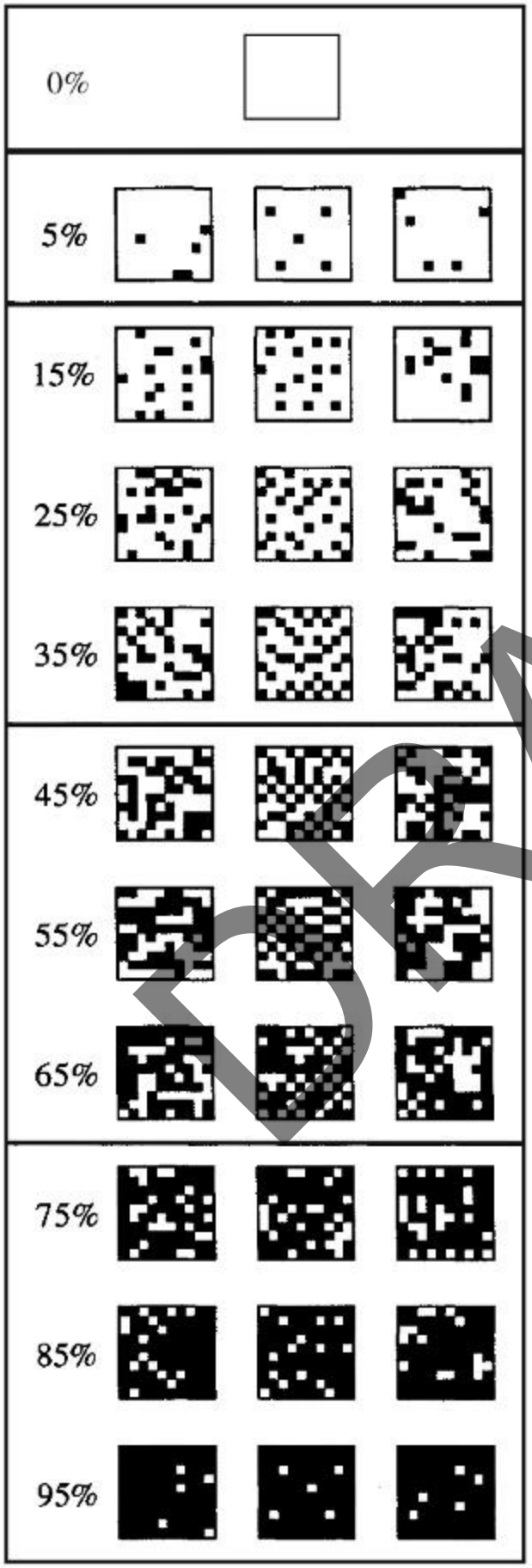
| PERCENT COVER | DENSITY CLASS |
|---|---|
| 0% | None 0% |
| 5% | Very Sparse 1% - 10% |
| 15%, 25%, 35% | Sparse 11% - 40% |
| 45%, 55%, 65% | Moderate 41% - 70% |
| 75%, 85%, 95% | Dense 71% - 100% |



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Source: http://simply-science-nbep.blogspot.com/2010/08/biomass-survey.html

# APPENDIX B.2

## LAKE COUNTY WETLAND FIELD CHECK PROTOCOL

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# APPENDIX B.2 LAKE COUNTY WRAPP WETLAND FIELD CHECK PROTOCOL

## PURPOSE

SMC developed a wetland field check form to address two main objectives for the WRAPP: 1) to ground-truth the mapped wetland polygon boundaries and GIS classification codes and 2) to review and refine the preliminary wetland functional assessment criteria developed by TAG for each of the 13 selected functions. A corollary benefit was to record information to support the wetland restoration/ preservation prioritization effort.

The WRAPP field check form was adapted from the "Simple Approach Wetland Field Check" form included in the Center for Watershed Protection's Wetlands-at-Risk-Protection-Tool (WARPT). SMC team members refined the form based on a literature review that included the Wisconsin Department of Natural Resources Wetland Rapid Assessment Methodology data form (WDNR WRAM, version 2.0), the Michigan Rapid Assessment Method for Wetlands rating form (MiRAM, version 2.1), the Minnesota Rapid Assessment Method Wetland Assessment data form (MNRAM, version 3.2), and the North Carolina Wetland Assessment Method Field Assessment Form (NC WAM, version 4.1). The draft WRAPP field check form was distributed to the TAG for feedback, and further refinements occurred after initial field testing.

The field check form was designed to collect sufficient data at representative sites within approximately 30 to 60 minutes (i.e., a quick field check). There are various metrics on the three-page field sheet. While the field check is based on the best judgment of [wetland and planning] professionals, data for many of the metrics are recorded via check-off boxes to minimize "measurement error" and differences in interpretation.

## ADVANCED PREPARATION (OFFICE)

Before the field check site visits begin, there are several items of advance preparation. These include the following:

1. Identify which wetland/water body sites to evaluate,
2. Identify field assessors,
3. Train and equip field assessors,
4. Prepare base maps, and
5. Complete pertinent portions of Section 1 (General Information) on the field check data form.

### *Identify the Sites to Evaluate*

SMC anticipates assessing five (5) to ten (10) representative sites in each of the four major watersheds in Lake County. Assessed sites will include a cross-section of wetlands/water body types, with emphasis placed on the types with the highest percent occurrence in each watershed based on the GIS analysis (LCWIe). For example, if forested floodplain wetlands and emergent isolated wetlands are the most dominant wetland types identified in the Des Plaines River Watershed, then possibly three (3) to five (5) sites representative of these wetland types would be selected for assessment, while one (1) to (2) sites representative of wetland types with lesser occurrence would be selected for assessment.

The sites selected for assessment mostly will occur on publicly-owned land, such as the Lake County Forest Preserves, IDNR-Illinois Beach State Park, or community park district properties. This will allow for easier site access. Furthermore, we expect the representative sites on these public lands to be in a more natural, undisturbed condition than sites on privately-owned lands.

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SMC will request written permission for site access in advance from each land-holding entity.

### *Identify Field Assessors*

SMC's principal wetland specialists – Glenn Westman and Juli Crane – will lead the field assessment process. Members of the Technical Advisory Group (TAG) will be invited to participate. Ideally, the field review will be conducted by a crew of at least three assessors. Field assessors do not need to be wetland specialists; however, at least one person on a team needs to be able to identify dominant plant species, understand common wetland plant communities and basic hydrologic processes affecting wetlands and waters in the Midwest, and be acquainted with biological aspects of the aquatic environment (i.e., wildlife habitat).

### *Train and Equip Field Assessors*

Instruct field assessors on the WRAPP-specific guidance (see section below). Basic equipment includes a tablet device with the field form template, digital cameras with GPS location capability, appropriate boots, a first aid kit, a tape measurer (ideally also a dbh tape), a soil probe (or Dutch auger or sharpshooter shovel), percent cover estimator guides, and Cowardin and LLWW classification guides. Crews may also wish to bring plant identification guides and plastic baggies. Each field crew will carry written authorization documenting permission for site access for the given land holding.

### *Prepare Base Maps*

Good field reference maps are essential. Such maps include the LCWIe, FEMA, soil survey, ADID mapping, topography, and current aerial photographs. Maps should appropriately scaled and marked to clearly depict and label the site to be reviewed.

### *Complete Pertinent Information in Section 1*

Ideally, as much of the field check form as possible should be completed prior to going into the field. This particularly includes information in Section 1, as well as information in other sections that require the use of reference maps (e.g., location relative to the floodplain).

## FIELD PROTOCOL

Field evaluations should occur after the start of the growing season and prior to the first vegetation (i.e., forbs) killing frost. In Lake County, this time period typically occurs from May through October and can vary somewhat from one year to the next.

Once in the field, the team will assign an assessor to fill out the form and determine who will review the site for specific metrics. The next step is for the team to walk the site and determine the general accuracy of wetland/water body boundaries relative to the GIS-mapped location and fill out the appropriate portion of Section 2 on the field check form. The intent is not to perform a formal, three-parameter wetland delineation per the Corps Wetland Delineation Manual. When in doubt, establish a conservative boundary (i.e., if field personnel do not agree on the wetland boundary, draw a generous boundary).

If there are multiple members to a field team, one assessor should focus on hydrology and alterations, walking the site to locate and evaluate inlets, outlets, and other aspects related to those metrics in Section 3 of the form. That person should note the location(s) of inlets, etc. on a map of the site. Other assessors would evaluate the wildlife habitat and vegetation features.

After a complete site review, the field team reconvenes and completes the field sheet together, ensuring that data on the form are as accurate and complete as possible. If necessary, they may revisit a portion of the site to appropriately complete the data form. Representative color photographs (at least one) are taken of the site using a digital camera with GPS location capability. Photos should depict show typical

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features of the site (e.g., vegetation, hydrology, and any other pertinent site features such as alterations).

The field process should take no more than 60 minutes, ideally closer to 30 minutes, per site.

## WRAPP-SPECIFIC GUIDANCE

### *Section 1 – General Information*

Most of the information in this section should be completed in the office before going to the field, and all necessary maps get compiled in preparation for the field visit. However, information on latitude, longitude, slope and weather conditions is completed in the field.

***Watershed:*** Refer to the Lake County Online Maps for this information and select the appropriate watershed from the drop-down list.

***Sub-Watershed:*** Refer to the Lake County Online Maps for this information and select the appropriate sub-watershed from the drop-down list.

***Unique Wetland ID:*** Refer to the identification number from the GIS layer. Be sure to include this number in the header for subsequent sheets of the data form. [This number will be an easy-to-ID label such as DP1, DP2, LM1.]

***Date and Assessed By:*** List date(s) the site was visited and last names of assessors.

***GIS/Photo ID #:*** List the unique identification number(s) associated with site-specific, georeferenced photographs taken of the wetland.

***Lat/Long:*** Use a field GPS to identify State plane coordinates for the latitude and longitude of the [general wetland/sample location] and list them on the form.

***Location:*** Include the nearest city, village, or town as well as a brief general description (e.g., southwest corner of wetland, etc.).

***Slope:*** Slope refers to the degree of inclination of the ground surface from horizontal. Select the appropriate range from the drop-down box. For reference, a rise in elevation of 1 foot over a horizontal distance of 100 feet has a slope gradient of 1 percent, while a slope of 100 feet over a horizontal distance of 100 feet has a slope gradient of 100 percent, or 45 degrees.

***Weather Conditions:*** This information is determined at the site on the day of the field visit and should be a brief description of conditions, temperature, etc. (e.g., 87 degrees, partly cloudy, recent heavy rainfall).

***Designated High Quality Site:*** Check this box if the LCWIe, ADID mapping or other official source indicates the wetland/water body is a known high-quality site. In the designated space, provide information on the nature of the high quality listing (e.g., ADID #107, INAI site name, RAMSAR designated site, etc.).

***Reference Maps:*** Check the applicable boxes of reference maps or other information compiled as part of the field preparation efforts.

### *Section 2 – Mapping Review/Verification of GIS*

***General:*** In the left-hand column, select the check box that best reflects the status of the observed wetland/water body boundary compared to the GIS-mapped boundary. If the observed boundary differs from the GIS-mapped location, mark the field-corrected boundary on the LCWIe map or the aerial map.

***For wetlands/water bodies confirmed as present:*** Select the check box that indicates if the Cowardin and the LLWW classifications are confirmed. If the checkbox for 'No' is selected, indicate the

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recommended change based on site observations.

### *Field Observations*

The data in this section primarily derive from observations taken during the site visit. Some items (e.g., connectivity to the floodplain) require using reference maps to complete. Check all boxes that apply.

***Hydrology**:* This portion of the form records field observations on hydrology and is divided into three categories: source, connectivity, and duration of water.

Source: This column targets the location or means by which a wetland/water body obtains hydration. Mark 'groundwater' if there is evidence of a groundwater flow such as seeps or springs. Infer the inflow of groundwater if significant coverage by plants commonly associated with groundwater is present. Indicators of groundwater include plants such as skunk cabbage (*Symplocarpus foetidus*), marsh marigold (*Caltha palustris*), great angelica (*Angelica atropurpurea*), and perfoliate boneset (*Eupatorium perfoliatum*). The presence of organic soils also can indicate a groundwater-dominated site. If the site receives hydrology from multiple sources, add a note under "Additional Observations/Remarks" (see subheading description below) indicating what appears to be the primary source of hydrology.

Other observations may include wastewater treatment, cooling water, and other inputs (e.g., road runoff, parking lot runoff, etc.).

Connectivity: This column focuses on water-based linkages or connections, both direct and indirect. Headwater wetlands typically occur adjacent to or upstream of a first-order stream. For areas of channelized flow, estimate the approximate velocity in feet per second by dropping a leaf or other floatable into the channel and determining the distance the item travels per second. Also estimate the channel cross-section width, and the distance that water level must rise before it overtops the banks. Record this information in the "Additional Observations/Remarks" section (see below).

Indicators: Use this column to record observations of hydrology on the date of the site visit. Use a ruler or tape measure to record surface water depths to the nearest 0.1 inch. To determine depth to the water table or soil saturation in a non-inundated site, dig a hole up to 24 inches deep using a soil probe, auger, or shovel.

Other observations may include water marks, sediment deposits, water stained leaves, crayfish burrows, drainage patterns, etc. See the *Midwest Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual* for additional indicator descriptions.

***Wildlife Habitat Features:*** This section addresses wildlife and their habitat, for all or a portion of their life stages.

General: Snags are standing dead trees. Coarse woody debris includes large limbs and trees lying on the ground. The presence of other wetlands within 500 feet may be based on observations made in the field, with the distance verified via Lake County Online Maps.

Amphibian breeding pools/nursery may be based on observer-specific knowledge of a given site. Alternately, it may be based on the presence of fishless water for more than 45 days. According to WDNR v. 2.0 (March 2014), 45 days is "a general minimum length of time for amphibians to successfully complete their breeding cycles." The presence of hydrology suitable for an amphibian breeding pool/nursery may be inferred based on the Hydrology: "Duration of Water" section (see above). In addition, however, the wetland must regularly dry down (to eliminate fish populations). This condition may be determined based on the "Cowardin Classification" code in Section 1, as modified by Section 2.

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Canopy: Check the box for the canopy description that best matches the site. The diameter at breast height (dbh) may be approximated using a regular measuring tape.

Connectivity: Consider both wetland and upland habitats that are contiguous with or linked to the subject wetland/water body. "Open space" includes parks, agricultural fields, hedge rows, etc. It does not include lawns smaller than 1 acre in size. The approximate size of the natural area/open space can be estimated from the aerial photograph during the field visit but should be verified via Lake County Online Maps. When sizing the natural area/open space, do not include areas of open water greater than 300 feet. Interruptions do not necessarily break connectivity. Mass developments (e.g., residential subdivision, industrial park, four-lane roads, etc.) break connectivity unless stormwater facilities (e.g., stormwater basins, native swales, etc.) maintain the connection.

Connectivity interruptions include features such as roads, dams, trails, etc. Their number is based on a count of such features between (or within) the subject wetland/water body and the natural area/open space.

The width of a corridor connection may be estimated in the field but should be verified via Lake County Online Maps. For a riparian connection, the corridor width includes the river or stream.

Details regarding connectivity and interruptions should be described in the "Additional Observations/Remarks" section (see below).

***Additional Observations/Remarks:*** Use this section to describe answers or provide additional detail concerning site characteristics, especially those not captured by metrics on the form. The following are examples of items that could be included in this section:

- If a site receives hydrology from multiple sources, add a note indicating what appears to be the primary source of hydrology.
- Describe details regarding connectivity and interruptions.
- For areas of channelized flow, record estimates of the approximate velocity in feet per second (by dropping a leaf or other floatable into the channel and determining the distance the item travels per second). Also record an estimate the channel cross-section width and the distance that water level must rise to overtop the banks.
- Describe any natural constrictions, if present.
- Include observations of wildlife species (insects, birds, mammals, amphibians, fish, etc.) and the type of observation (e.g., scat, nest, track, direct observation, feathers, etc.).
- Indicate any rare species that were previously recorded at a site (e.g., EcoCAT database, etc.) but not observed during the field visit.

***Vegetation:***

General: For vegetation to be both dense and persistent, it must be perennial, have stems or stalks that remain during the non-growing season) and have enough density to attenuate erosive forces from currents and/or wave action. By way of example, although common arrowhead (*Sagittaria latifolia*) is a perennial plant and can form dense colonies, it is not persistent because stalks do not remain erect through the winter.

Evaluate the percent coverage of vegetation for marsh areas (if present) and determine if the site has one-quarter or more cover by vegetation. For non-marsh areas, indicate if the canopy is closed (including canopies that are nearly closed and have only gaps associated with natural processes, e.g., natural tree fall or downed trees from storm damage) or if the canopy is sparse or absent. If the canopy is opened more than would occur from natural gaps, do not mark either check box.

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Check the box if the shoreline is exposed to conditions that may be erosive (e.g., exposed to open water 2,500+ feet wide (NCWFAT 2010), exposed to waters with regular boat traffic that creates high-energy wakes, lacking densely rooted, persistent emergent or woody vegetation able to attenuate erosive waves or currents, etc.). If persistent emergent or woody vegetation is absent but an aquatic bed zone attenuates wind/wave action, check the box. This is because shoreline erosion protection only occurs for part of the year (i.e., when the aquatic bed vegetation is present).

Littoral zone wetland width is evaluated from the bank/shoreline inward of the wetland/water body and ends at the limit of submergent or aquatic bed vegetation community. Check the box indicating the littoral zone width at the site. This metric involves field effort with adjustments based on Lake County Online Maps.

*Diversity*: Check the appropriate box to indicate if diversity is high, low, or dominated by non-natives. Percent cover by non-native plants is used as a surrogate for diversity, based on the premise that plant diversity decreases as cover by non-native plants increases. Determine non-native plant cover based on visual estimates (use the cover estimating tool as an aide).

For "Dominant Plant Species," record the most dominant species (up to three or four) in the wetland, based on visual observation. A Floristic Quality Assessment (FQA) does not need to be performed. The field assessors should agree on what species are dominant after walking the site.

If any rare plants are observed, mark the check box. Do not mark the checkbox if rare plants have been observed previously (e.g., EcoCAT database, etc.). That information instead should be recorded in the "Additional Observations/Remarks" section.

*Plant Strata:* Data are recorded relative to the presence and condition of four strata: trees, sapling/shrub, herb, and vines. Plant communities may not have multiple strata, so check only the boxes that apply. A non-checked box indicates the stratum was not present. Diameter and height distinguish between the tree and shrub/sapling strata. To be recorded as present, a stratum (excluding vines) should have at least 10% aerial cover. A closed or dense stratum reflects a canopy that is closed or nearly closed (i.e., with only natural gaps associated with natural processes). A sparse stratum is one that is very limited, or absent. If the canopy is neither closed nor sparse, do not mark either box.

*Percent Ground Cover*: Select the check box for the range that best represents the extent of ground cover. Use the accompanying field guide with black/white representations of different percent cover ranges.

*Interspersion*: Varied habitats with a high degree of edge typically support greater wildlife diversity. The first part of documenting interspersion involves selecting the figure that best represents the degree of edge between living vegetation and open water during the growing season. The selected figure should reflect the maximum vegetated condition; if the assessment occurs early in the growing season, use best professional judgment to select the figure that reflects the maximum vegetation expected later in the growing season). The second part involves identifying the dominant habitat structure (e.g., hemi-marsh, emergent/shrub, wetland/upland complex, etc.), which should correspond with the "Cowardin Classification" from Section 1 (as modified by Section 2).

***Alterations***: This metric considers the degree of intactness (or lack of disturbance) and applies to the condition of the area being assessed as well as the nearby surroundings that may affect the site. Alterations reflect past and current land uses. Field observations form the basis for determining the type and extent of site alteration(s). If the assessor is unsure of the time frame in which the alteration(s) occurred based on the field review, then he/she should review

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historic aerial photographs at Lake County Online Maps to support a determination.

*Evidence of Water Quality Issues*: Document the presence of degraded water quality conditions at the site, such as the presence of dead fish or amphibians, dredging, oily sheen, septic odor, salt intrusion or build-up, discolored or cloudy/turbid water, excessive algae or macrophyte blooms. Also indicate the possible source(s) of the condition (e.g., point-source discharge, agricultural runoff, stormwater inputs, etc.).

*Evidence of Altered Hydrology/Hydrologic Connectivity*: Alterations in wetland hydrology and hydrologic connectivity can involve increased inputs of water or a reduction in hydrology. Record observations of conditions or activities influence hydrology at the site. Such influences include drainage (e.g., ditches, tiles), installation of water control structures and outlet constrictions (e.g., culverts, bridges, dams—including those constructed by beavers, or roads), a high proportion of open water and/or dead/dying trees, stream channelization, and modifications to overbank and/or overland flow.

Overbank flow occurs when the water level rises to the point where it exceeds the bank elevation and covers land beyond the banks. Sedimentation, debris lines, leaning or flattened vegetation can indicate overbank flow has occurred. Overland flow refers to the movement of water over land, typically downslope. A site does not need a tributary to have overland flow.

*Relative Level and Permanence of Disturbance, and Sources*: Note if disturbance occurs in the site or a buffer area around the site. Also estimate the percent disturbed area relative to the entire wetland/water body.

Historic refers to an alteration that is evident but not likely causing a measurable effect on the wetland as it exists currently (e.g., a ditch was excavated in the past that drained the wetland, but the wetland area has reached a new equilibrium with the ditch feature). An alteration is not considered historic if it still affects the wetland (e.g., a wetland is still being drained by the ditch and an equilibrium has not yet been achieved).

*Ground Surface/Vegetation Condition:* Check the boxes that reflect observed modifications to the ground surface or the condition of vegetation in the wetland/water body. This metric is irrespective of the timeframe of the perturbation. Alterations to the ground surface and/or vegetative condition include direct physical alterations (e.g., mowing, tilling, selective clearing, clear-cutting, grading, herbicide, vehicle tracks, intensive grazing—especially from hooved animals, etc.) as well as indirect influences (e.g., human-induced sedimentation or burial, erosion, or exposure, soil compactions, etc.).

### *Section 4 – Checklist of Wetland Functions*

Below is guidance for completing the 13 functional categories of this section. Reference the Preliminary Wetland Functional Assessment Criteria developed by the TAG for these determinations.

***Ability to Perform Function:*** Rate the qualitative degree to which the wetland performs the given function: High (H), Moderate (M), Low (L), or not applicable (n/a). The rating is based on indicators of wetland functions rather than measurements of the given function.

***Field Observations to Support Function:*** Note specific observations or aspects in support of the qualitative rating given for a wetland to perform a given function.

***Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations:*** Note suggested revisions to the criteria used for assessing wetland functions. All suggested revisions will be presented to the TAG for concurrence.

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## REFERENCES

Center for Watershed Protection (CWP). Wetlands-at-Risk-Protection-Tool (WARPT), Field Assessment of Wetland Functions and "Simple Approach Wetland Field Check" http://www.wetlandprotection.org/identify-priority-wetlands/assess-wetland-functions-field/10.html.

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Minnesota Board of Water and Soil Resources. 2008. *Minnesota Routine Assessment Method for Evaluating Wetland Functions* (MNRAM) (Version 3.2), Wetland Assessment Data Form: http://www.bwsr.state.mn.us/wetlands/mnram/index.html.

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# APPENDIX B.3

## REPRESENTATIVE FIELD SITE SUMMARY SHEETS

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# Site: DP-01

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PEMC **LLWW Code:** LE4BABI

**Notable Features:** **Dominant Plants:** *Typha x glauca, Salix interior, Cyperus esculentus, Echinochloa crus-galli*

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** Moderate*

**Nutrient Transformation (P):** Moderate*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** Moderate

**Stream Baseflow Maintenance:** N/A

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** High

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

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# Site: DP-02

**Watershed:** Des Plaines River **Sub-Watershed:** Indian Creek **NWI Code:** PEMAd **LLWW Code:** LS1FPTH

**Notable Features:** **Dominant Plants:** *Agrostis gigantea, Eleocharis* spp.

## Functional Ratings

**Carbon Sequestration:** Low

**Flood Water Storage:** High

**Native Fish Habitat:** Low

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** High*

**Shoreline/Stream Bank Stabilization:** Moderate

**Stream Baseflow Maintenance:** Moderate

**Stream Shading:** Low

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Moderate*

**Wetland-Dependent Bird Habitat, Other:** Moderate

**Wildlife Movement Corridor:** Moderate*

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

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# Site: DP-03

**Watershed:** Des Plaines River **Sub-Watershed:** North Mill Creek **NWI Code:** PEM/FO1Ad **LLWW Code:** TEBAIS

**Notable Features:**

**Dominant Plants:** *Phalaris arundinacea, Fraxinus pennsylvanica, Populus deltoides*

## Functional Ratings

**Carbon Sequestration:** Low

**Flood Water Storage:** Moderate*

**Native Fish Habitat:** N/A

**Nutrient Transformation (P):** High*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low*

*Rating revised per field review

# Site: DP-04

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PFO1A **LLWW Code:** LS1FPTH

**Notable Features:** **Dominant Plants:** *Rhamnus cathartica*

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** N/A

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** Moderate

**Stream Shading:** High*

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High*

**Woodland Amphibian Habitat:** Low

*Rating revised per field review

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# Site: DP-05

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PFO1C **LLWW Code:** LR1FPbaTH

**Notable Features:**

**Dominant Plants:** *Acer saccharinum, Lysimachia nummularia*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** High

**Native Fish Habitat:** Moderate

**Nutrient Transformation (P):** Moderate*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** Low

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Moderate

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low

*Rating revised per field review

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# Site: DP-06

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PFO1Cd **LLWW Code:** LR1FPbaTH

**Notable Features:** **Dominant Plants:** *Fraxinus* spp., *Persicaria amphibia, Sium suave*

## Functional Ratings

Carbon Sequestration: **High**

Flood Water Storage: **High**

Native Fish Habitat: **Moderate**

Nutrient Transformation (P): **Low***

Sediment and Other Particulate Retention: **High**

Shoreline/Stream Bank Stabilization: **N/A**

Stream Baseflow Maintenance: **Low**

Stream Shading: **N/A**

Unique Wetland Resources: **N/A**

Waterfowl Habitat: **Moderate**

Wetland-Dependent Bird Habitat, Other: **Low**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **Low**

*Rating revised per field review

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# Site: DP-07

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PEM/FO1C **LLWW Code:** LR1FPbaTH

**Notable Features:** **Dominant Plants:** *Schoenoplectus fluviatilis, Leersia oryzoides, Acer negundo, Acer saccharinum*

## Functional Ratings

**Carbon Sequestration:** **Moderate**

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Moderate**

**Nutrient Transformation (P):** **Moderate***

**Sediment and Other Particulate Retention:** **High**

**Shoreline/Stream Bank Stabilization:** **High**

**Stream Baseflow Maintenance:** **Low**

**Stream Shading:** **Moderate***

**Unique Wetland Resources:** **N/A**

**Waterfowl Habitat:** **Low***

**Wetland-Dependent Bird Habitat, Other:** **Low***

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **Low***

*Rating revised per field review

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# Site: DP-08

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PEM/FO1C **LLWW Code:** LR1FPbaTH

**Notable Features:**

**Dominant Plants:** *Phalaris arundinacea, Typha x glauca, Ulmus americana, Rhamnus cathartica, Acer saccharinum*

## Functional Ratings

**Carbon Sequestration:** **Moderate**

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Moderate**

**Nutrient Transformation (P):** **Moderate***

**Sediment and Other Particulate Retention:** **High**

**Shoreline/Stream Bank Stabilization:** **N/A**

**Stream Baseflow Maintenance:** **Low**

**Stream Shading:** **Moderate***

**Unique Wetland Resources:** **N/A**

**Waterfowl Habitat:** **Moderate**

**Wetland-Dependent Bird Habitat, Other:** **Low***

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **Low**

*Rating revised per field review

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# Site: DP-09

**Watershed:** Des Plaines River **Sub-Watershed:** Mill Creek **NWI Code:** PEMCd **LLWW Code:** LS1FPTH

**Notable Features:** ADID 44 **Dominant Plants:** *Typha x glauca*

## Functional Ratings

Carbon Sequestration: **Moderate**

Flood Water Storage: **High**

Native Fish Habitat: **Moderate**

Nutrient Transformation (P): **Low***

Sediment and Other Particulate Retention: **High**

Shoreline/Stream Bank Stabilization: **High**

Stream Baseflow Maintenance: **High**

Stream Shading: **Low**

Unique Wetland Resources: **High**

Waterfowl Habitat: **High**

Wetland-Dependent Bird Habitat, Other: **High**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **N/A**

*Rating revised per field review

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# Site: DP-10

**Watershed:** Des Plaines River **Sub-Watershed:** North Mill Creek **NWI Code:** PEM/FO1C **LLWW Code:** LS1FPTH

**Notable Features:** Adjacent stream is high quality **Dominant Plants:** *Rhamnus cathartica, Phalaris arundinacea, Acer negundo*

## Functional Ratings

Carbon Sequestration: **Moderate**

Flood Water Storage: **High**

Native Fish Habitat: **Low***

Nutrient Transformation (P): **Moderate***

Sediment and Other Particulate Retention: **High**

Shoreline/Stream Bank Stabilization: **High**

Stream Baseflow Maintenance: **High**

Stream Shading: **Moderate**

Unique Wetland Resources: **High**

Waterfowl Habitat: **Low***

Wetland-Dependent Bird Habitat, Other: **Low***

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **Low**

*Rating revised per field review

DRAFT

# Site: DP-11

**Watershed:** Des Plaines River **Sub-Watershed:** North Mill Creek **NWI Code:** PEM/FO1Ad **LLWW Code:** LS1FPflTH

**Notable Features:** **Dominant Plants:** *Acer negundo, Phalaris arundinacea*

## Functional Ratings

**Carbon Sequestration:** Low

**Flood Water Storage:** High

**Native Fish Habitat:** Low

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** High

**Stream Baseflow Maintenance:** Moderate

**Stream Shading:** Moderate*

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low

*Rating revised per field review

DRAFT

# Site: DP-12

**Watershed:** Des Plaines River **Sub-Watershed:** Mill Creek **NWI Code:** PEMCh **LLWW Code:** TEBAOU

**Notable Features:** ADID 60 **Dominant Plants:** *Typha x glauca, Schoenoplectus fluviatilis, Phalaris arundinacea*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** High

**Native Fish Habitat:** Low

**Nutrient Transformation (P):** Moderate*

**Sediment and Other Particulate Retention:** Moderate

**Shoreline/Stream Bank Stabilization:** Moderate

**Stream Baseflow Maintenance:** N/A*

**Stream Shading:** Low

**Unique Wetland Resources:** High

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** High

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: DP-13

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PFO1A **LLWW Code:** LR1FPflTH

**Notable Features:**

**Dominant Plants:** *Persicaria virginiana, Rhus radicans, Ulmus* spp.

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** Low

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** High*

**Stream Baseflow Maintenance:** Low

**Stream Shading:** High

**Unique Wetland Resources:** N/A

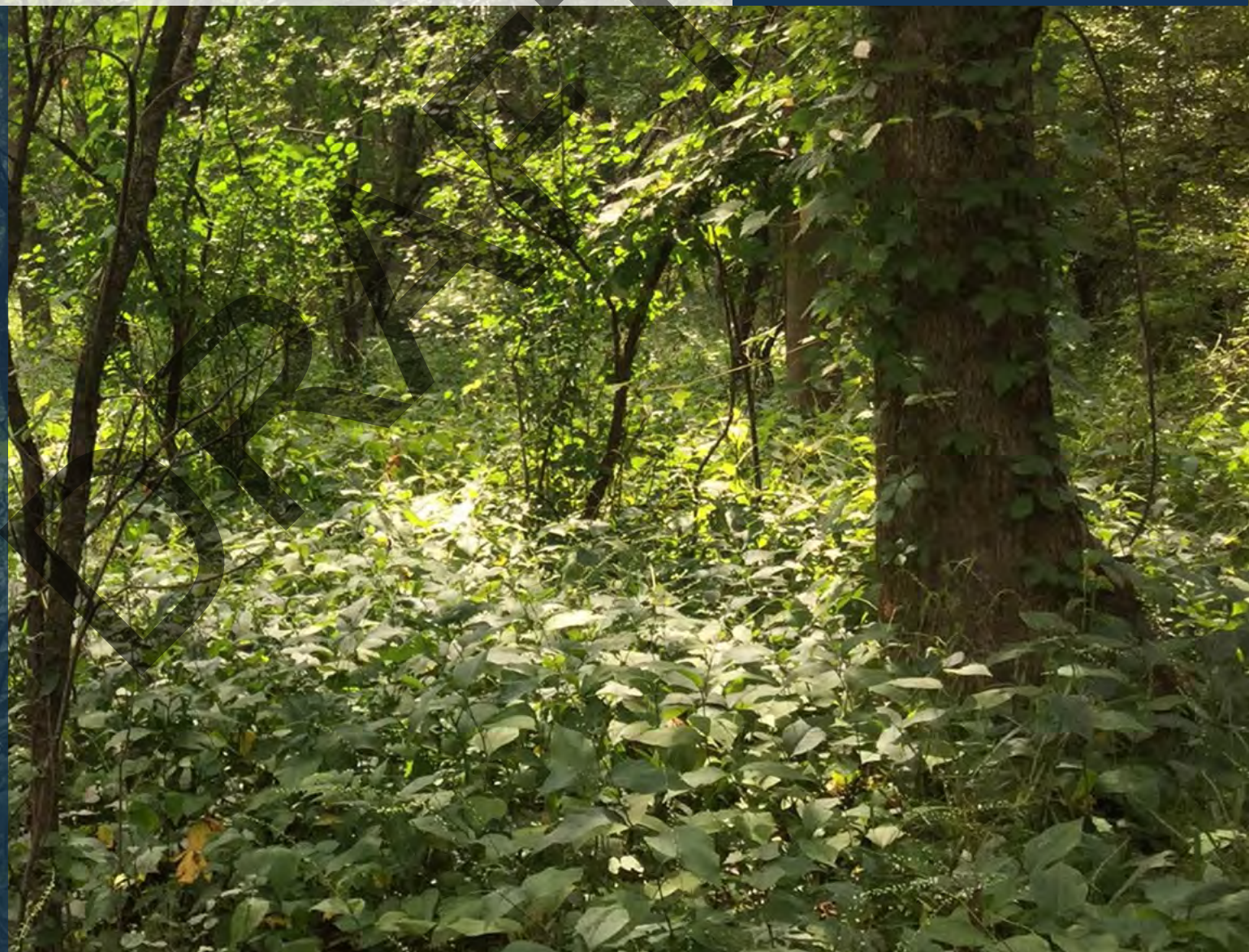
**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low

*Rating revised per field review



# Site: DP-14

**Watershed:** Des Plaines River **Sub-Watershed:** Buffalo Creek **NWI Code:** PEM/FO1C **LLWW Code:** LS1FPTH

**Notable Features:** **Dominant Plants:** *Acer saccharinum, Rhamnus cathartica, Phalaris arundinacea*

## Functional Ratings

**Carbon Sequestration:** **Moderate**

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Low**

**Nutrient Transformation (P):** **Moderate***

**Sediment and Other Particulate Retention:** **High**

**Shoreline/Stream Bank Stabilization:** **High**

**Stream Baseflow Maintenance:** **High**

**Stream Shading:** **Moderate***

**Unique Wetland Resources:** **N/A**

**Waterfowl Habitat:** **Low***

**Wetland-Dependent Bird Habitat, Other:** **Low**

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **Low**

*Rating revised per field review

DRAFT

# Site: DP-15

**Watershed:** Des Plaines River **Sub-Watershed:** Indian Creek **NWI Code:** PEM/SS1C **LLWW Code:** TEBAslTI

**Notable Features:**

**Dominant Plants:** Salix nigra, Rhamnus cathartica, Phalaris arundinacea, Typha x glauca

## Functional Ratings

Carbon Sequestration: **Moderate**

Flood Water Storage: **High***

Native Fish Habitat: **Low***

Nutrient Transformation (P): **Moderate***

Sediment and Other Particulate Retention: **Moderate***

Shoreline/Stream Bank Stabilization: **N/A***

Stream Baseflow Maintenance: **N/A**

Stream Shading: **N/A**

Unique Wetland Resources: **N/A**

Waterfowl Habitat: **Low***

Wetland-Dependent Bird Habitat, Other: **High**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **Low***

*Rating revised per field review

DRAFT

# Site: DP-16

**Watershed:** Des Plaines River **Sub-Watershed:** Indian Creek **NWI Code:** PEMAf **LLWW Code:** TEBAIS

**Notable Features:** **Dominant Plants:** *Zea mays, Cyperus esculentus, Chenopodium album, Setaria viridis*

## Functional Ratings

**Carbon Sequestration:** Low

**Flood Water Storage:** High

**Native Fish Habitat:** N/A

**Nutrient Transformation (P):** Moderate

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** N/A

DRAFT

# Site: DP-17

**Watershed:** Des Plaines River **Sub-Watershed:** Bull Creek **NWI Code:** PEMCd **LLWW Code:** TEBATH

**Notable Features:** **Dominant Plants:** *Typha x glauca*

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** High*

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** Low*

**Shoreline/Stream Bank Stabilization:** Low*

**Stream Baseflow Maintenance:** Moderate

**Stream Shading:** Low

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** High

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: DP-18

**Watershed:** Des Plaines River

**Sub-Watershed:** Lower Des Plaines River

**NWI Code:** PFO1C

**LLWW Code:** TEBAwvOI

**Notable Features:** Vernal Pool

**Dominant Plants:** *Carex lupulina, Fraxinus nigra*

## Functional Ratings

**Carbon Sequestration:** Low

**Flood Water Storage:** Low

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Moderate*

**Sediment and Other Particulate Retention:** Moderate

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A

**Stream Shading:** N/A

**Unique Wetland Resources:** High

**Waterfowl Habitat:** Moderate

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** High

*Rating revised per field review

DRAFT

# Site: DP-19

**Watershed:** Des Plaines River **Sub-Watershed:** Lower Des Plaines River **NWI Code:** PFO1Cd **LLWW Code:** TEFLTI

**Notable Features:** ADID 176 **Dominant Plants:** *Fraxinus nigra, Carex* spp., *Cinna arundinacea, Quercus bicolor*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** Moderate

**Native Fish Habitat:** N/A

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** Low

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A*

**Stream Shading:** N/A

**Unique Wetland Resources:** High

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** High*

*Rating revised per field review

DRAFT

# Site: DP-98

**Watershed:** Des Plaines River **Sub-Watershed:** Bull Creek **NWI Code:** PFO1A **LLWW Code:** LS1FPflTH

**Notable Features:** **Dominant Plants:** *Rhamnus cathartica, Phragmites australis* ssp. *australis, Lonicera* spp.

## Functional Ratings

**Carbon Sequestration:** **Moderate**

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Low**

**Nutrient Transformation (P):** **Low***

**Sediment and Other Particulate Retention:** **High**

**Shoreline/Stream Bank Stabilization:** **High**

**Stream Baseflow Maintenance:** **Moderate**

**Stream Shading:** **High**

**Unique Wetland Resources:** **High**

**Waterfowl Habitat:** **Low**

**Wetland-Dependent Bird Habitat, Other:** **Low**

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **Low**

*Rating revised per field review

DRAFT

# Site: DP-99

**Watershed:** Des Plaines River **Sub-Watershed:** Upper Des Plaines River **NWI Code:** PEM/SS1C **LLWW Code:** TEBAIS

**Notable Features:**

**Dominant Plants:** *Typha angustifolia, Typha x glauca, Salix* spp.

## Functional Ratings

**Carbon Sequestration:** **Moderate**

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Low***

**Nutrient Transformation (P):** **High**

**Sediment and Other Particulate Retention:** **High**

**Shoreline/Stream Bank Stabilization:** **N/A**

**Stream Baseflow Maintenance:** **N/A**

**Stream Shading:** **N/A**

**Unique Wetland Resources:** **N/A**

**Waterfowl Habitat:** **Low***

**Wetland-Dependent Bird Habitat, Other:** **High**

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **Low***

*Rating revised per field review

DRAFT

# Site: FX-01

**Watershed:** Fox River **Sub-Watershed:** Squaw Creek **NWI Code:** PEMFh **LLWW Code:** LE3bILTB

**Notable Features:** ADID 125 **Dominant Plants:** *Typha x glauca*

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** Moderate

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** Low

**Stream Baseflow Maintenance:** N/A*

**Stream Shading:** N/A

**Unique Wetland Resources:** High

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** High

**Wildlife Movement Corridor:** Low*

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: FX-02

**Watershed:** Fox River **Sub-Watershed:** Upper Fox River **NWI Code:** PFO1A **LLWW Code:** TEBABI

**Notable Features:** **Dominant Plants:** *Rhamnus cathartica, Quercus bicolor, Fraxinus pensylvanica, Boehmeria cylindrica*

## Functional Ratings

Carbon Sequestration: **Moderate**

Flood Water Storage: **High**

Native Fish Habitat: **N/A**

Nutrient Transformation (P): **Low***

Sediment and Other Particulate Retention: **Low**

Shoreline/Stream Bank Stabilization: **N/A**

Stream Baseflow Maintenance: **N/A**

Stream Shading: **N/A**

Unique Wetland Resources: **N/A**

Waterfowl Habitat: **Low**

Wetland-Dependent Bird Habitat, Other: **Low**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **Low**

*Rating revised per field review

DRAFT

# Site: FX-03

**Watershed:** Fox RIver **Sub-Watershed:** Upper Fox River **NWI Code:** PEMFh **LLWW Code:** LE3aILTB

**Notable Features:** ADID 48 **Dominant Plants:** *Typha x glauca*

## Functional Ratings

**Carbon Sequestration:** Moderate*

**Flood Water Storage:** High

**Native Fish Habitat:** High*

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** Low

**Stream Baseflow Maintenance:** Low

**Stream Shading:** Low

**Unique Wetland Resources:** High

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** High

**Wildlife Movement Corridor:** Low*

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: FX-05

**Watershed:** Fox River **Sub-Watershed:** Squaw Creek **NWI Code:** PSS1C **LLWW Code:** TEBAOI

**Notable Features:** **Dominant Plants:** *Salix interior, Rhamnus cathartica, Solidago* spp.

## Functional Ratings

**Carbon Sequestration:** **High**

**Flood Water Storage:** **High***

**Native Fish Habitat:** **Low***

**Nutrient Transformation (P):** **Moderate***

**Sediment and Other Particulate Retention:** **Moderate**

**Shoreline/Stream Bank Stabilization:** **N/A**

**Stream Baseflow Maintenance:** **N/A***

**Stream Shading:** **N/A**

**Unique Wetland Resources:** **High**

**Waterfowl Habitat:** **Moderate**

**Wetland-Dependent Bird Habitat, Other:** **High**

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **low***

*Rating revised per field review

DRAFT

# Site: FX-06

**Watershed:** Fox River **Sub-Watershed:** Slocum Lake **NWI Code:** PABHh **LLWW Code:** LS6dTIPD2i

**Notable Features:**

**Dominant Plants:** *Ranunculus longirostris, Phalaris arundinacea*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** High

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Low

**Sediment and Other Particulate Retention:** Moderate

**Shoreline/Stream Bank Stabilization:** N/A*

**Stream Baseflow Maintenance:** Low

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

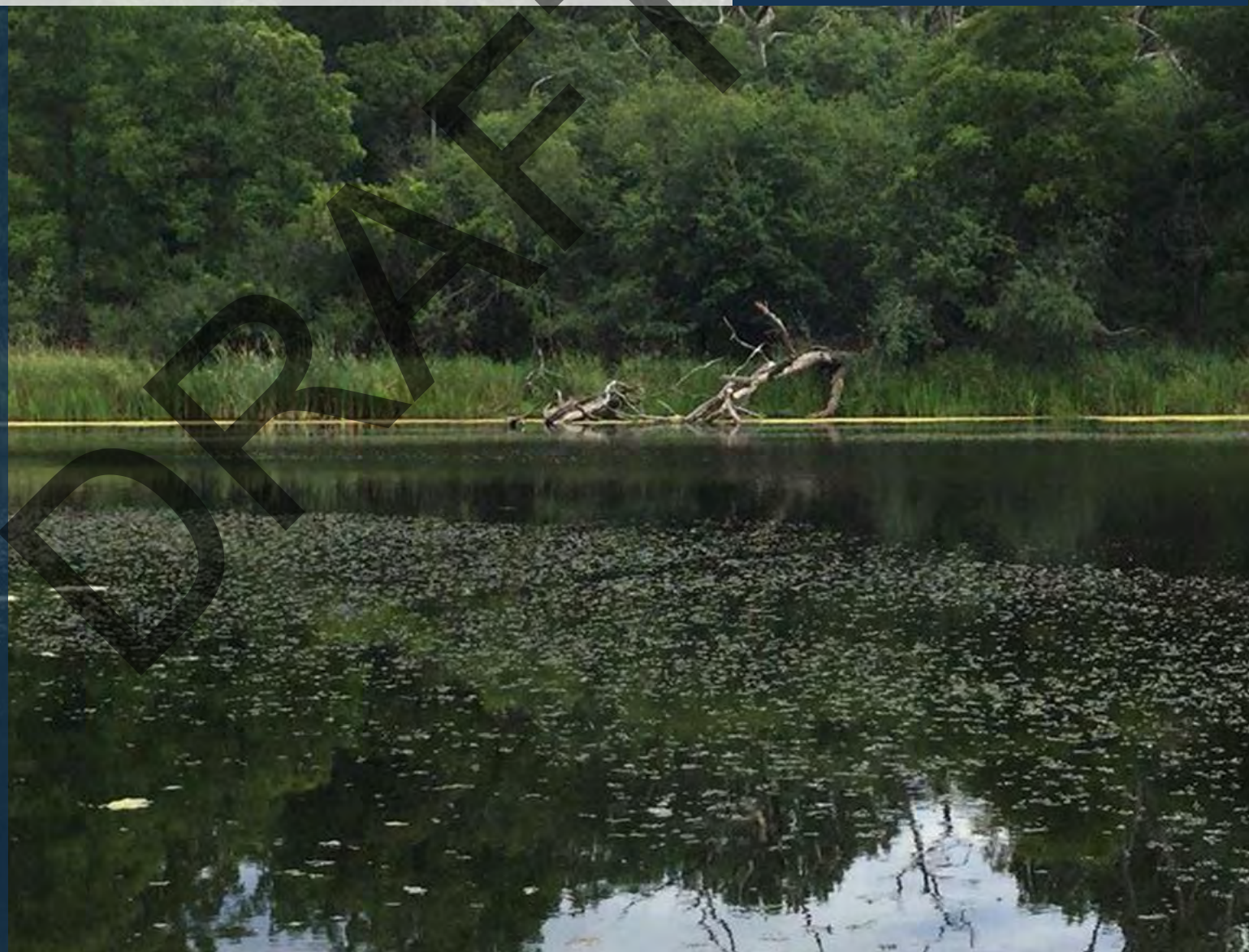
**Waterfowl Habitat:** High*

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** Moderate

**Woodland Amphibian Habitat:** Low

*Rating revised per field review



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# Site: FX-07

**Watershed:** Fox River **Sub-Watershed:** Squaw Creek **NWI Code:** PEM/SS1C **LLWW Code:** TEBAOI **Notable Features:** ADID 25

**Dominant Plants:** *Sparganium eurycarpum, Rhamnus cathartica, Phalaris arundinacea, Salix nigra*

## Functional Ratings

Carbon Sequestration: **Moderate**

Flood Water Storage: **High**

Native Fish Habitat: **Low***

Nutrient Transformation (P): **Moderate***

Sediment and Other Particulate Retention: **Moderate**

Shoreline/Stream Bank Stabilization: **N/A***

Stream Baseflow Maintenance: **N/A**

Stream Shading: **N/A**

Unique Wetland Resources: **High**

Waterfowl Habitat: **Low***

Wetland-Dependent Bird Habitat, Other: **High**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **Low***

*Rating revised per field review

DRAFT

# Site: FX-08

**Watershed:** Fox RIver **Sub-Watershed:** Upper Fox River **NWI Code:** PEM/FO1Cd **LLWW Code:** TEBAslTI

**Notable Features:** **Dominant Plants:** *Phalaris arundinacea, Fraxinus pensylvanica, Carex* spp.

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** Moderate*

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A*

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low*

**Wetland-Dependent Bird Habitat, Other:** Low*

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low*

*Rating revised per field review

DRAFT

# Site: FX-09

**Watershed:** Fox River **Sub-Watershed:** Lower Fox River **NWI Code:** PEMBd **LLWW Code:** TEBATI

**Notable Features:** ADID 65, INAI site **Dominant Plants:** *Carex* spp., *Calamagrostis canadensis*, *Symphyotrichum lanceolatum*, *Sparganium eurycarpum*

## Functional Ratings

Carbon Sequestration: **Moderate**

Flood Water Storage: **High**

Native Fish Habitat: **N/A**

Nutrient Transformation (P): **Low***

Sediment and Other Particulate Retention: **Moderate***

Shoreline/Stream Bank Stabilization: **N/A**

Stream Baseflow Maintenance: **N/A***

Stream Shading: **N/A**

Unique Wetland Resources: **High**

Waterfowl Habitat: **Low**

Wetland-Dependent Bird Habitat, Other: **Low**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **N/A**

*Rating revised per field review

DRAFT

# Site: FX-10

**Watershed:** Fox River **Sub-Watershed:** Lower Fox River **NWI Code:** PEM/SS1D **LLWW Code:** LR6bFPTH

**Notable Features:** ADID 147 **Dominant Plants:** *Carex* spp., *Lythrum alatum, Typha x glauca*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** High

**Native Fish Habitat:** N/A*

**Nutrient Transformation (P):** Low

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** N/A*

**Stream Baseflow Maintenance:** Low*

**Stream Shading:** N/A*

**Unique Wetland Resources:** High

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** High

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low

*Rating revised per field review

DRAFT

# Site: FX-11

**Watershed:** Fox River **Sub-Watershed:** Lower Fox River **NWI Code:** PAB3Ghx **LLWW Code:** LR6bTHPD3o

**Notable Features:** ADID 147 **Dominant Plants:** *Ranunculus* spp., *Lemna* spp.

## Functional Ratings

**Carbon Sequestration:** **High**

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Moderate***

**Nutrient Transformation (P):** **Low***

**Sediment and Other Particulate Retention:** **Moderate***

**Shoreline/Stream Bank Stabilization:** **N/A**

**Stream Baseflow Maintenance:** **N/A***

**Stream Shading:** **N/A**

**Unique Wetland Resources:** **High**

**Waterfowl Habitat:** **High**

**Wetland-Dependent Bird Habitat, Other:** **Moderate**

**Wildlife Movement Corridor:** **Moderate***

**Woodland Amphibian Habitat:** **N/A**

*Rating revised per field review

DRAFT

# Site: FX-12

**Watershed:** Fox River **Sub-Watershed:** Flint Creek **NWI Code:** L1UBHh **LLWW Code:** LS6dTHLK3a

**Notable Features:** ADID 167 **Dominant Plants:** Unvegetated area

## Functional Ratings

**Carbon Sequestration:** N/A

**Flood Water Storage:** High

**Native Fish Habitat:** High

**Nutrient Transformation (P):** Low

**Sediment and Other Particulate Retention:** High*

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** High*

**Stream Shading:** N/A

**Unique Wetland Resources:** High

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** N/A

**Wildlife Movement Corridor:** Low

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: FX-13

**Watershed:** Fox River **Sub-Watershed:** Flint Creek **NWI Code:** L2ABHh **LLWW Code:** LS6dTHLK3a

**Notable Features:** ADID 167 **Dominant Plants:** *Nymphaea tuberosa*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** High

**Native Fish Habitat:** High

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** Moderate*

**Shoreline/Stream Bank Stabilization:** N/A*

**Stream Baseflow Maintenance:** High*

**Stream Shading:** N/A

**Unique Wetland Resources:** High

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** Moderate

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: FX-14

**Watershed:** Fox River **Sub-Watershed:** Squaw Creek **NWI Code:** PEMCf **LLWW Code:** TEBAIS

**Notable Features:** **Dominant Plants:** *Echinochloa crus-galli, Bidens fondosa*

## Functional Ratings

**Carbon Sequestration:** Low

**Flood Water Storage:** High

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Moderate

**Sediment and Other Particulate Retention:** High

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: FX-99

**Watershed:** Fox River **Sub-Watershed:** Sequoit Creek **NWI Code:** PEM/SS1Cd **LLWW Code:** TEBAIS

**Notable Features:**

**Dominant Plants:** *Phalaris arundinacea, Leersia oryzoides, Salix interior*

## Functional Ratings

**Carbon Sequestration:** **Moderate**

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Low***

**Nutrient Transformation (P):** **High**

**Sediment and Other Particulate Retention:** **High**

**Shoreline/Stream Bank Stabilization:** **N/A**

**Stream Baseflow Maintenance:** **N/A**

**Stream Shading:** **N/A**

**Unique Wetland Resources:** **N/A**

**Waterfowl Habitat:** **Low***

**Wetland-Dependent Bird Habitat, Other:** **High**

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **Low***

*Rating revised per field review

DRAFT

# Site: LM-01

**Watershed:** Lake Michigan **Sub-Watershed:** Bluff **NWI Code:** R4SBA **LLWW Code:** LS4OIST4

**Notable Features:**

**Dominant Plants:** *Agrostis gigantea, Lythrum salicaria, Bidens* spp.

## Functional Ratings

**Carbon Sequestration:** Low*

**Flood Water Storage:** Moderate

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Low

**Sediment and Other Particulate Retention:** Low

**Shoreline/Stream Bank Stabilization:** Low*

**Stream Baseflow Maintenance:** N/A

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low*

**Wildlife Movement Corridor:** Moderate*

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: LM-02

**Watershed:** Lake Michigan **Sub-Watershed:** Kellogg Creek **NWI Code:** R4SBCx **LLWW Code:** LS7TAST7b

**Notable Features:** ADID9 **Dominant Plants:** *Leersia oryzoides, Persicaria amphibia*

## Functional Ratings

Carbon Sequestration: **Low**

Flood Water Storage: **High**

Native Fish Habitat: **Low**

Nutrient Transformation (P): **Low**

Sediment and Other Particulate Retention: **Low**

Shoreline/Stream Bank Stabilization: **Low**

Stream Baseflow Maintenance: **N/A**

Stream Shading: **N/A**

Unique Wetland Resources: **High**

Waterfowl Habitat: **Moderate**

Wetland-Dependent Bird Habitat, Other: **Low***

Wildlife Movement Corridor: **Low**

Woodland Amphibian Habitat: **N/A**

*Rating revised per field review

# Site: LM-03

**Watershed:** Lake Michigan **Sub-Watershed:** Waukegan **NWI Code:** PFO1C **LLWW Code:** TEBAslTI

**Notable Features:** **Dominant Plants:** *Quercus bicolor, Quercus rubra, Fraxinus pennsylvanica, Glyceria striata*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** Moderate*

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Moderate*

**Sediment and Other Particulate Retention:** Moderate*

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** Low*

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Moderate

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low*

*Rating revised per field review

DRAFT

# Site: LM-04

**Watershed:** Lake Michigan **Sub-Watershed:** Waukegan **NWI Code:** PEM/FO1Cd **LLWW Code:** TEBAslTI

**Notable Features:** **Dominant Plants:** *Typha x glauca, Phalaris arundinacea, Bidens frondosa, Ulmus americana*

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** Low

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** Moderate*

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A*

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low*

**Wetland-Dependent Bird Habitat, Other:** Low*

**Wildlife Movement Corridor:** Low

**Woodland Amphibian Habitat:** Low*

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*Rating revised per field review

DRAFT

# Site: LM-07

**Watershed:** Lake Michigan **Sub-Watershed:** Dead River **NWI Code:** PFO1D **LLWW Code:** TESLOU

**Notable Features:** Seep/spring, ravine **Dominant Plants:** *Impatiens capensis, Phragmites australis* ssp. *australis*

## Functional Ratings

**Carbon Sequestration:** High

**Flood Water Storage:** Low

**Native Fish Habitat:** N/A

**Nutrient Transformation (P):** Low

**Sediment and Other Particulate Retention:** Low

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** High

**Stream Shading:** High

**Unique Wetland Resources:** High

**Waterfowl Habitat:** N/A

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High*

**Woodland Amphibian Habitat:** Low

*Rating revised per field review

# Site: LM-98

**Watershed:** Lake Michigan **Sub-Watershed:** Kellogg Creek **NWI Code:** PEMFd **LLWW Code:** LS1BAidTH

**Notable Features:** ADID 9 **Dominant Plants:** *Sparganium eurycarpum, Bidens frondosa*

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** Low*

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** Moderate*

**Shoreline/Stream Bank Stabilization:** High

**Stream Baseflow Maintenance:** High*

**Stream Shading:** Low

**Unique Wetland Resources:** High

**Waterfowl Habitat:** High

**Wetland-Dependent Bird Habitat, Other:** High

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** N/A

*Rating revised per field review

DRAFT

# Site: LM-99

**Watershed:** Lake Michigan **Sub-Watershed:** Dead River **NWI Code:** PEME **LLWW Code:** TEBAidOI

**Notable Features:** Sedge Meadow **Dominant Plants:** *Carex* spp., *Spartina pectinata*

## Functional Ratings

**Carbon Sequestration:** **High***

**Flood Water Storage:** **High**

**Native Fish Habitat:** **Low***

**Nutrient Transformation (P):** **Low***

**Sediment and Other Particulate Retention:** **Moderate***

**Shoreline/Stream Bank Stabilization:** **N/A***

**Stream Baseflow Maintenance:** **N/A***

**Stream Shading:** **N/A***

**Unique Wetland Resources:** **High**

**Waterfowl Habitat:** **Moderate***

**Wetland-Dependent Bird Habitat, Other:** **High**

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **N/A**

*Rating revised per field review

DRAFT

# Site: NB-01

**Watershed:** North Branch Chicago River **Sub-Watershed:** Middle Fork **NWI Code:** PEMA **LLWW Code:** LS1FPTH

**Notable Features:** **Dominant Plants:** *Phalaris arundinacea*

## Functional Ratings

Carbon Sequestration: **Low**

Flood Water Storage: **High**

Native Fish Habitat: **N/A**

Nutrient Transformation (P): **Low***

Sediment and Other Particulate Retention: **High**

Shoreline/Stream Bank Stabilization: **N/A**

Stream Baseflow Maintenance: **Moderate**

Stream Shading: **N/A**

Unique Wetland Resources: **N/A**

Waterfowl Habitat: **Moderate***
Wetland-Dependent Bird

Habitat, Other: **Moderate**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **N/A**

*Rating revised per field review

DRAFT

# Site: NB-02

**Watershed:** North Branch Chicago **Sub-Watershed:** Middle Fork **NWI Code:** PSS1A **LLWW Code:** TEBAIS

**Notable Features:** **Dominant Plants:** *Rhamnus cathartica*

## Functional Ratings

**Carbon Sequestration:** **Moderate**

**Flood Water Storage:** **Moderate**

**Native Fish Habitat:** **N/A**

**Nutrient Transformation (P):** **High***

**Sediment and Other Particulate Retention:** **High**

**Shoreline/Stream Bank Stabilization:** **N/A**

**Stream Baseflow Maintenance:** **N/A**

**Stream Shading:** **N/A**

**Unique Wetland Resources:** **N/A**

**Waterfowl Habitat:** **Low**

**Wetland-Dependent Bird Habitat, Other:** **Moderate**

**Wildlife Movement Corridor:** **High**

**Woodland Amphibian Habitat:** **Low***

*Rating revised per field review

DRAFT

# Site: NB-03

**Watershed:** North Branch Chicago River **Sub-Watershed:** West Fork **NWI Code:** PFO1Ad **LLWW Code:** TEFLTI

**Notable Features:** **Dominant Plants:** *Populus deltoides, Rhamnus cathartica, Symphyotrichum lateriflorum*

## Functional Ratings

**Carbon Sequestration:** Moderate

**Flood Water Storage:** High

**Native Fish Habitat:** N/A

**Nutrient Transformation (P):** Low*

**Sediment and Other Particulate Retention:** Low

**Shoreline/Stream Bank Stabilization:** N/A

**Stream Baseflow Maintenance:** N/A*

**Stream Shading:** N/A

**Unique Wetland Resources:** N/A

**Waterfowl Habitat:** Low

**Wetland-Dependent Bird Habitat, Other:** Low

**Wildlife Movement Corridor:** High

**Woodland Amphibian Habitat:** Low*

*Rating revised per field review

DRAFT

# Site: NB-04

**Watershed:** North Branch Chicago River **Sub-Watershed:** Skokie RIver **NWI Code:** R2UBHx **LLWW Code:** LS1THST1b

**Notable Features:** **Dominant Plants:** *Ceratophyllum demersum*

## Functional Ratings

Carbon Sequestration: **N/A**

Flood Water Storage: **High**

Native Fish Habitat: **Low**

Nutrient Transformation (P): **Low**

Sediment and Other Particulate Retention: **Low**

Shoreline/Stream Bank Stabilization: **N/A**

Stream Baseflow Maintenance: **N/A**

Stream Shading: **N/A**

Unique Wetland Resources: **High***

Waterfowl Habitat: **Moderate**
Wetland-Dependent Bird

Habitat, Other: **N/A**

Wildlife Movement Corridor: **Low Woodland**

Amphibian Habitat: **N/A**

*Rating revised per field review

DRAFT

# Site: NB-05

**Watershed:** North Branch Chicago River **Sub-Watershed:** Middle Fork **NWI Code:** PEMAd **LLWW Code:** LS1FPbaTH

**Notable Features:** **Dominant Plants:** *Bidens frondosa, Boltonia latisquama recognita, Penthorum sedoides*

## Functional Ratings

Carbon Sequestration: **Low**

Flood Water Storage: **High**

Native Fish Habitat: **N/A***

Nutrient Transformation (P): **Low***

Sediment and Other Particulate Retention: **High**

Shoreline/Stream Bank Stabilization: **N/A***

Stream Baseflow Maintenance: **Moderate**

Stream Shading: **Low**

Unique Wetland Resources: **High**

Waterfowl Habitat: **Moderate**

Wetland-Dependent Bird Habitat, Other: **Moderate**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **N/A**

*Rating revised per field review

DRAFT

# Site: NB-06

**Watershed:** North Branch Chicago River **Sub-Watershed:** Middle Fork **NWI Code:** PEM/SS1Cd **LLWW Code:** TEBAslTI

**Notable Features:** **Dominant Plants:** *Rhamnus cathartica, Persicaria virginiana, Glyceria striata*

## Functional Ratings

Carbon Sequestration: **Moderate**

Flood Water Storage: **Low***

Native Fish Habitat: **Low**

Nutrient Transformation (P): **Low***

Sediment and Other Particulate Retention: **Moderate***

Shoreline/Stream Bank Stabilization: **N/A**

Stream Baseflow Maintenance: **N/A***

Stream Shading: **N/A**

Unique Wetland Resources: **N/A**

Waterfowl Habitat: **Low***

Wetland-Dependent Bird Habitat, Other: **High**

Wildlife Movement Corridor: **High**

Woodland Amphibian Habitat: **Low***

*Rating revised per field review

# APPENDIX B.4

## FIELD DATA SUMMARY TABLE

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| Site | GIS Number | Watershed | Sub-watershed | Date of Site Visit | Assessed By | Slope (%) | Weather Conditions | Recent (24hr) Precipitation (in) | Designated as HQAR or ADID? | Notable Features | NWI Class | LLWW Class | Landscape Position | Landform | Water Flow Path | Water Body | Wetland Boundary Verification | Soil Verification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | 9947 | Des Plaines River | Upper Des Plaines River | 09/07/16 | JEC, MP, GW | 0-2 | Overcast, humid, 85° F | 0.01 | No | | PEMC | LEBABI | Lentic | Fringe | Bi-directional | | location differs from LCWIe (see field mark-up for revised boundary) | mineral |
| DP-02 | 236 | Des Plaines River | Indian Creek | 08/12/16 | JEC, GW, MP | 6-12 | Warm, sunny, humid, 80° F | 0.20 | No | | PEMAd | LS1FPTHchfg | Lotic-Stream | Fringe | Through-flow | | generally matches LCWIe | mineral |
| DP-03 | 9498 | Des Plaines River | North Mill Creek | 09/01/16 | JEC, MP, RK | 0-2 | Sunny, 70° F | 0 | No | | PEM/FO1Ad | TEBAIOdr | Terrene | Basin | Isolated | | location differs from LCWIe (see field mark-up for revised boundary) | mineral |
| DP-04 | 16054 | Des Plaines River | Upper Des Plaines River | 09/07/16 | JEC, GW, MP | 0-2 | Humid, overcast, 79° F | 0.01 | No | | PFO1A | LS1FPTH | Lotic-Stream | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-05 | 17960 | Des Plaines River | Upper Des Plaines River | 08/11/16 | JEC, GW, MP | 0-2 | Sunny, 92° F | 0 | No | | PFO1C | LR1FPbaTH | Lotic-River | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-06 | 16735 | Des Plaines River | Upper Des Plaines River | 09/02/16 | JEC, MP, GW | 0-2 | Moderate to heavy rain, thunder, 85° F | 0.10 | No | | PFO1Cd | LR1FPbaTH | Lotic-River | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-07 | 17957 | Des Plaines River | Upper Des Plaines River | 08/11/16 | JEC, GW, MP | 0-2 | Hot, humid, sunny, 90° F | 0 | No | | PEM/FO1C | LR1FPbaTH | Lotic-River | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-08 | 17961 | Des Plaines River | Upper Des Plaines River | 08/11/16 | JEC, GW | 0-2 | Sunny, 92° F | 0 | No | | PFO1/EMC | LR1FPbaTH | Lotic-River | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-09 | 16405 | Des Plaines River | Mill Creek | 08/31/16 | JEC, GW, MP | 0-2 | Sunny, 76° F | 0 | Yes | ADID 44 | PEMCd | LS1FPTH | Lotic-Stream | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-10 | 7256 | Des Plaines River | North Mill Creek | 08/26/16 | MP, JEC | 0-2 | Sunny, 80° F | 0 | Yes | Adjacent stream is high quality | PEM/FO1C | LS1FPTH | Lotic-Stream | Floodplain | Through-flow | | location differs from LCWIe (see field mark-up for revised boundary) | mineral |
| DP-11 | 13996 | Des Plaines River | North Mill Creek | 09/01/16 | JEC, RK, MP | 0-2 | Partly cloudy, 70° F | 0 | No | | PEM/FO1Ad | LS1FPfITHchdr | Lotic-Stream | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-12 | 16896 | Des Plaines River | Mill Creek | 08/31/16 | JEC, GW, MP, TG | 0-2 | Partly sunny, 73° F | 0 | Yes | ADID 60 | PEMCh | TEBAOU | Lotic-Stream | Floodplain | Through-flow | | generally matches LCWIe | organic |
| DP-13 | 17857 | Des Plaines River | Upper Des Plaines River | 08/11/16 | JEC, GW, MP | 0-2 | Hot, humid, sunny, 90° F | 0 | No | | PFO1A | LR1FPTH | Lotic-River | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-14 | 152 | Des Plaines River | Buffalo Creek | 10/06/16 | MP, GW | 0-2 | Overcast, 63° F | 0.20 | No | | PEM/FO1C | LS1FPTH | Lotic-Stream | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| DP-15 | 1821 | Des Plaines River | Indian Creek | 10/06/16 | MP, GW | 0-2 | Overcast, rain | 0.30 | No | | PEM/ SS1C | TEBAslTI | Terrene | Basin | Through-flow | | generally matches LCWIe | mineral |
| DP-16 | 2513 | Des Plaines River | Indian Creek | 10/06/16 | MP, GW | 0-2 | Overcast, light rain | 0.30 | No | | PEMAf | TEBAISag | Terrene | Basin | Isolated | | generally matches LCWIe | mineral |
| DP-17 | 17336 | Des Plaines River | Bull Creek | 10/06/16 | MP, GW | 0-2 | Overcast, 67° F | 0.30 | No | | PEMCd | TEBATHchhw | Terrene | Basin | Outflow | | generally matches LCWIe | organic |
| DP-18 | 5839 | Des Plaines River | Lower Des Plaines River | 10/11/16 | JEC, GW, MP, MC, LB, SE | 0-4 | Sunny, 65° F | 0 | Yes | Vernal pool | PFO1C | TEBAwvOI | Terrene | Basin | Isolated | | generally matches LCWIe | mineral |
| DP-19 | 14847 | Des Plaines River | Lower Des Plaines River | 10/11/16 | JEC, GW, MP, MC, SE, LB | 0-2 | Overcast, 65° F | 0 | Yes | ADID 176 | PFO1Cd | TEFLTIchdrfd | Terrene | Flat | Through-flow | | generally matches LCWIe | mineral |
| DP-98 | 40486 | Des Plaines River | Bull Creek | 06/11/16 | GW, JEC, MP | 2-6 | Humid, 84° F, sunny | 1.35 | Yes | ADID 105 | PFO1A | LS1FPfITHchfg | Lotic-Stream | Floodplain | Through-flow | | location differs from LCWIe (wetland narrower along creek than mapped) | mineral |
| DP-99 | NA | Des Plaines River | Upper Des Plaines River | 06/10/16 | GW, JEC, MP | 0-2 | Humid, 80° F, sunny | 1.35 | No | | PEM/SS1C | TEBAIS | Terrene | Basin | Isolated | | generally matches LCWIe | mineral |
| FX-01 | 33 | Fox River | Squaw Creek | 08/04/16 | GW, JEC, MP | 0-2 | Sunny, hot, humid, 90° F | 0 | Yes | ADID 125 | PEMFh | LE3bILBI | Lentic | Island | Bi-directional | | generally matches LCWIe | n/a |
| FX-02 | 12808 | Fox River | Upper Fox River | 08/26/16 | JEC, MP, GW, MC | 0-2 | Partly cloudy, 75F | 0 | No | | PFO1A | TEBABI | Terrene | Basin | Bi-directional | | location differs from LCWIe (see field mark-up for revised boundary) | mineral |
| FX-03 | 6995 | Fox River | Upper Fox River | 08/31/16 | JEC, GW, MP | 0-2 | Sunny, 67° F | Trace | Yes | ADID 48 | PEMFh | LE3aILTBch | Lentic | Island | Bi-directional | | generally matches LCWIe | n/a |
| FX-05 | 2880 | Fox River | Squaw Creek | 08/09/16 | JEC, GW | 0-2 | Sunny, 88° F | 0 | No | | PSS1C | TEBAOI | Terrene | Basin | Outflow | | generally matches LCWIe | mineral |
| FX-06 | 21882 | Fox River | Slocum Lake | 08/09/16 | JEC, GW | 0-2 | Sunny, 88° F | 0 | No | | PABHh | LS6bPDTIPD2i | Lotic-Stream | Basin | Through-flow | Pond | generally matches LCWIe | n/a |
| FX-07 | 2678 | Fox River | Squaw Creek | 08/04/16 | JEC, GW, MP, MM | 0-2 | Sunny, 85° F | 0 | Yes | ADID 25 | PEM/SS1C | TEBAOI | Terrene | Basin | Outflow | | generally matches LCWIe | mineral |
| FX-08 | 7212 | Fox River | Upper Fox River | 08/31/16 | JEC, GW, MP | 0-2 | Sunny, 72° F | 0.20 | No | | PEM/FO1Cd | TEBAslTI | Terrene | Basin | Through-flow | | generally matches LCWIe | mineral |
| FX-09 | 21834 | Fox River | Lower Fox River | 08/26/16 | JEC, GW, MP, MC | 0-2 | Sunny, 70° F | 0 | Yes | ADID 65, INAI site | PEMBd | TEBATIbgchdr | Lentic | Fringe | Bi-directional | | generally matches LCWIe | organic |
| FX-10 | 3881 | Fox River | Lower Fox River | 10/04/16 | JEC, GW | 0-2 | Partly cloudy, 68° F | 0 | Yes | ADID 147 | PEM/SS1D | LR6bFPTH | Lotic-River | Floodplain | Through-flow | | generally matches LCWIe | organic |
| FX-11 | 3917 | Fox River | Lower Fox River | 10/04/16 | JEC, GW | 0-2 | Cloudy, 62° F | 0 | Yes | ADID 147 | PAB3Ghx | LR6bPDTHchPD3o | Lotic-River | Floodplain | Through-flow | Pond | generally matches LCWIe | n/a |
| FX-12 | 362 | Fox River | Flint Creek | 10/04/16 | JEC, GW | 0-2 | Cloudy, 71° F | 0 | Yes | ADID 167 | L1UBHh | LS6dLKTHLK3a | Lotic-Stream | Floodplain | Through-flow | Lake | generally matches LCWIe | n/a |
| FX-13 | 362 | Fox River | Flint Creek | 10/04/16 | JEC, GW | 0-2 | Partly cloudy, 70° F | 0 | Yes | ADID 167 | L2ABHh | LS6dLKTHLK3a | Lotic-Stream | Floodplain | Through-flow | Lake | generally matches LCWIe | n/a |
| FX-14 | 3105 | Fox River | Squaw Creek | 10/25/16 | JEC, GW | 0-2 | Cloudy, 48° F | 0 | No | | PEMCf | TEBAIS | Terrene | Basin | Isolated | | generally matches LCWIe | mineral |
| FX-99 | 9195 | Fox River | Sequoit Creek | 08/26/16 | MP, JEC | 0-2 | Sunny, 77° F | 0 | | | PEMC/SS1Cd | TEBAIS | Terrene | Basin | Isolated | | generally matches LCWIe | mineral |
| LM-01 | 4250 | Lake Michigan | Bluff | 08/24/16 | JEC, MP, MC | 0-2 in bottom, 2-4 on sideslopes | Partly cloudy, 84° F | 0.20 | No | | R4SBA | LS4STOIST4 | Lotic-Stream | | Outflow | Stream | location differs from LCWIe (see field mark-up for revised boundary) | mineral |
| LM-02 | 13650 | Lake Michigan | Kellogg Creek | 09/15/16 | JEC, MP, GW, MC, RK | 0-2 | Sunny, 71° F | Trace | Yes | ADID 9, Ramsar | R2SBCx | LS7STTAchglST7b | Lotic-Stream | | Through-flow | Stream | generally matches LCWIe | mineral |
| LM-03 | 10430 | Lake Michigan | Waukegan | 09/01/16 | GW, MM | 4-8 | Partly cloudy, 68° F | Trace | No | | PFO1C | TEBAslTIfg | Terrene | Basin | Through-flow | | generally matches LCWIe | mineral |
| LM-04 | 10594 | Lake Michigan | Waukegan | 08/24/16 | JEC, MP, MC, RK, MJC, KC | 0-2 | Overcast, 70° F | 0.50 | No | | PEM/FO1Cd | TEBAslTIchdr | Terrene | Basin | Outflow | | generally matches LCWIe | mineral |
| LM-07 | | Lake Michigan | Dead River | 10/13/16 | JEC, MP, GW, EH | 12-20 | Sunny, 46° F | 0.25 | Yes | Seep/spring, ravine | PFO1D | TESLOUgd | Terrene | Slope | Isolated | Stream | generally matches LCWIe | organic |
| LM-98 | 9940 | Lake Michigan | Kellogg Creek | 09/15/16 | MP, GW, JEC, RK, DM, MC, BS | 0-2 | Partly sunny to sunny, 74° F | Trace | Yes | ADID 9, Ramsar | PEMFd | LS1BAidTHchdrglrs | Lentic | Basin | Through-flow | | generally matches LCWIe | organic |
| LM-99 | 9924 | Lake Michigan | Dead River | 09/15/16 | JEC, MP, GW, MC, BS, DM, RK, KC, PS, PW | 0-2 | Sunny, 70° F | 0.01 | Yes | Ramsar, Sedge meadow | PEME | TEBAidOlgdglrsss | Lentic | Basin | Through-flow | | generally matches LCWIe | mineral |
| NB-01 | 4154 | North Branch Chicago River | Middle Fork | 08/19/16 | MP, GW | 0-2 | Overcast, 82° F | 0.50 | No | | PEMA | LS1FPTH | Lotic-Stream | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| NB-02 | 5899 | North Branch Chicago River | Middle Fork | 08/12/16 | JEC, GW, MP | 0-2 | Sunny, warm, humid, 80° F | 0.20 | No | | PSS1A | TEBAIS | Terrene | Basin | Outflow | | location differs from LCWIe (see field mark-up for revised boundary) | mineral |
| NB-03 | 4832 | North Branch Chicago River | West Fork | 08/12/16 | JEC, GW | 0-2 | Sunny, 86F | 0.20 | No | | PFO1Ad | TEFLTIchdr | Terrene | Flat | Through-flow | | location differs from LCWIe (see field mark-up for revised boundary) | mineral |
| NB-04 | 13868 | North Branch Chicago River | Skokie River | 08/25/16 | JEC, MP, MC, MM | 0-2 | Cloudy, 82° F | 0.18 | No | | R2UBHd | LS1STTHchST1b | Lotic-Stream | | Through-flow | Stream | generally matches LCWIe | mineral |
| NB-05 | 6086 | North Branch Chicago River | Middle Fork | 08/18/16 | GW, JEC | 0-2 | Sunny, humid, 87° F | 0.20 | No | INAI | PEMAd | LS1FbaPTHchdr | Lotic-Stream | Floodplain | Through-flow | | generally matches LCWIe | mineral |
| NB-06 | 5293 | North Branch Chicago River | Middle Fork | 08/19/16 | GW, MP | 0-2 | Overcast, 80° F | 0.50 | No | | PEM/SS1Cd | TEBAslTIchdrfg | Terrene | Basin | Through-flow | | location differs from LCWIe (see field mark-up for revised boundary) | mineral |

| Site | Cowardin Classification from NWI/LCWIe Confirmed? | Recommend Changes Based on Observations | LLWW classification from LCWIe confirmed? | Recommend Changes Based on Observations: | Source of Hydrology | Other | Surface Connectivity | Indicators of Hydrology | Water Depth (in) | Water Table Depth (in) | Soil Saturation Depth (in) | Water Marks Height (in) | Other Hydrology Indicators |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | Yes | | Yes | | depressional, groundwater, surface, overbank | | within 100 ft, contiguous, discharges to surface water, nonchannelized | surface, soil saturation, water marks, water table, water, drift, crayfish | 0-2 | 0-6 | 0-6 | 7-12 | |
| DP-02 | Yes | | Yes | | groundwater, surface, overbank | | within 100 ft, connected, contiguous, discharges to surface water | soil saturation, water marks, water table, water, sediment | | 7-12 | 0-6 | 7-12 | |
| DP-03 | No | PFO1/EMAd | Yes | | depressional, surface, stormwater | | nonchannelized, channelized | soil saturation, water marks, water table, water, drift | | >24 | >24 | 7-12 | |
| DP-04 | Yes | | Yes | | depressional, surface, overbank | | within 100 ft, contiguous, nonchannelized | soil saturation, water marks, water table, water, drift | | >24 | >24 | 0-6 | |
| DP-05 | Yes | | Yes | | depressional, groundwater, surface, overbank | | within 100 ft | water marks, drift, water | | >24 | >24 | 0-12 | |
| DP-06 | No | PFO1Cd | Yes | | depressional, groundwater, surface, overbank | | within 100 ft, connected, nonchannelized, discharges to surface water, channelized | water marks, water table, water, drift, crayfish | | >24 | >24 | 24 | |
| DP-07 | Yes | | Yes | | depressional, groundwater, surface, overbank | | within 100 ft, connected, contiguous, discharges to surface water, nonchannelized | soil saturation, water marks, water table, sediment, drift | | 13-24 | 13-24 | 0-6 | |
| DP-08 | Yes | | Yes | | depressional, groundwater, surface, overbank | | within 100 ft, contiguous, discharges to surface water, nonchannelized | soil saturation, water marks, water table | | 13-24 | 7-12 | 14 | |
| DP-09 | No | PEMCd | Yes | | groundwater, surface, overbank | | within 100 ft, connected, contiguous, discharges to surface water, channelized, nonchannelized | soil saturation, water marks, water table, water, drift, other | | 13-24 | 13-24 | 7-12 | *Lemna minor* on surface |
| DP-10 | Yes | | Yes | | overbank, groundwater, surface, stormwater | | within 100 ft, connected, contiguous, discharges to surface water, nonchannelized, channelized | surface, soil saturation, water table, drift | 0-2 | 13-24 | 13-24 | | |
| DP-11 | No | PFO1/EMAd | Yes | | depressional, groundwater, surface, overbank | | within 100 ft, contiguous, discharges to surface water, nonchannelized, connected, channelized | soil saturation, water table, water, sediment, drift | | >24 | >24 | | |
| DP-12 | No | PEMCh | No | TEBAOU | depressional, groundwater, surface, overbank | | within 100 ft, connected, contiguous, discharges to surface water, nonchannelized, channelized | soil saturation, water table | | >24 | 13-24 | | |
| DP-13 | Yes | | Yes | | groundwater, overbank | | within 100 ft, contiguous, discharges to surface water, nonchannelized | soil saturation, water table | | >24 | >24 | | |
| DP-14 | Yes | | Yes | | groundwater, surface, overbank | | within 100 ft, connected, contiguous, discharges to surface water, nonchannelized | soil saturation, water marks, water table, water, drift | | >24 | >24 | 0-6 | |
| DP-15 | No | PEM/ SS1C | No | | depressional, surface, stormwater | | contiguous, nonchannelized | surface, soil saturation, water marks, water table | 0-6 | 22 | 20 | 7-12 | |
| DP-16 | No | PEMAf | Yes | | depressional, groundwater, surface | | | soil saturation, water marks, water table, sediment, drift, other | | >24 | >24 | 0-6 | Exposed root structure on corn plants |
| DP-17 | Yes | | Yes | | depressional, groundwater, surface, stormwater | | within 100 ft, connected, contiguous, discharges to surface water, headwaters, channelized, nonchannelized | water table, surface, soil saturation, water marks, water table, drift | 0-24 | 0 | 0 | 13-24 | |
| DP-18 | Yes | | No | | depressional, groundwater, surface | | nonchannelized | surface, soil saturation, water marks, water table, water, drift, crayfish | 0-6 in center of pool | 7-12 | 0-6 | 13-24 | |
| DP-19 | Yes | | Yes | | depressional, groundwater, surface | | connected, contiguous, discharges to surface water, nonchannelized, channelized | surface, soil saturation, water marks, water table, water, crayfish | 0-2 | >24 | >24 | 0-6 | |
| DP-98 | Yes | | Yes | | overbank, surface, stormwater | surface runoff is minor source of hydrology | within 100 ft, connected, contiguous, discharges to surface water | water marks, water table, drift, sediment | | >24 | >24 | 0-6 | |
| DP-99 | No | PEM/SS1C | Yes | | depressional, groundwater, surface | | | surface, soil saturation, water marks, water | 0-24 | 0 | 0-6 | 7-12 | |
| FX-01 | Yes | | Yes | | depressional, groundwater, surface | | within 100 ft, connected, contiguous, discharges to surface water | surface, soil saturation, water marks, water table, water | 0-24 | 0 | 0 | 7-12 | |
| FX-02 | Yes | | Yes | | depressional, surface, overbank | | within 100 ft, discharges to surface water, nonchannelized | soil saturation, water marks, water table, water, drift, crayfish | | >24 | >24 | 0-6 | |
| FX-03 | No | PEMFh | Yes | | groundwater, other | | within 100 ft, contiguous, discharges to surface water, nonchannelized | surface, soil saturation, water marks, water table | 0-24 | 0-6 | 0-6 | 0-6 | |
| FX-05 | Yes | | Yes | | depressional, groundwater, surface, stormwater | | headwaters,contiguous | water marks, water table | | >24 | >24 | 4 | |
| FX-06 | No | PAB, not PUB--need to revisit below items | No | Looks more like Lentic pond 2i; pond is not a landform option. | depressional, groundwater, surface | | within 100 ft, connected, contiguous, discharges to surface water | surface, soil saturation, water table | 0-4; fish presence suggests deeper areas | 0 | 0 | | |
| FX-07 | Yes | | Yes | | depressional, groundwater, surface | | | surface, soil saturation, water marks | 0-6 | 0 | 2 | 3-6 | |
| FX-08 | Yes | | Yes | | depressional, groundwater, surface | | within 100 ft | surface, soil saturation, water marks, water table, water, crayfish | 0>24 | >24 | >24 | 0-6 | |
| FX-09 | No | PEMBd | No | TEBATH. Not influenced by lake | depressional, groundwater, surface, other | | within 100 ft, contiguous, nonchannelized | soil saturation, water table | | 0-6 | 0-6 | | |
| FX-10 | No | PEM/SS1D | Yes | | groundwater, surface, overbank | | within 100 ft, contiguous, nonchannelized, discharges to surface water | surface, soil saturation, water table | 0-2 | 0 | 0 | | |
| FX-11 | No | PAB3Ghx | No | LRFPOUPD3x | depressional, groundwater, surface, overbank | | within 100 ft, connected, contiguous, discharges to surface water, nonchannelized | surface, soil saturation, water table | >24 | 0 | 0 | | |
| FX-12 | No | L1UBHh | Yes | | depressional, groundwater, surface, stormwater | | within 100 ft, connected, contiguous, discharges to surface water, nonchannelized | surface | >24 | 0 | 0 | | |
| FX-13 | Yes | | Yes | | depressional, groundwater, surface, stormwater | | within 100 ft, contiguous, discharges to surface water, connected, nonchannelized | surface | >24 | 0 | 0 | | |
| FX-14 | Yes | | Yes | | depressional, groundwater, surface | | within 100 ft | soil saturation, water table | | >24 | >24 | | |
| FX-99 | No | PEM/SS1Cd | Yes | | depressional, groundwater, surface | | | soil saturation, water marks, water table, water | | 13-24 | 7-12 | 0-6 | |
| LM-01 | Yes | | Yes | | surface, stormwater | | connected, discharges to surface water, headwaters, channelized | surface, soil saturation, water marks, water table, water, sediment, drift | 0-6 | 0-6 | 0-6 | 0-6 | |
| LM-02 | No | R4SBCd | No | LSTIST | groundwater, surface | | within 100 ft, connected, contiguous, discharges to surface water, channelized | soil saturation, water marks, water table, water, sediment, drift | | 7-12 | 0-6 | >24 | |
| LM-03 | Yes | | Yes | | depressional, groundwater, surface | | channelized, nonchannelized | soil saturation, water marks, water table, water | | >24 | >24 | 0-6 | |
| LM-04 | Yes | | No | TH based on culvert | groundwater, surface, overbank, stormwater | | connected, channelized | soil saturation, water marks, water table, water, sediment, drift | | 7-12 | 0-6 | 0-6 | |
| LM-07 | Yes | | No | TESLOU | groundwater, surface, overbank | | within 100 ft, nonchannelized, discharges to surface water | soil saturation, water table, water | | 13-24 | 0-6 | | |
| LM-98 | No | PEMFd | Yes | | depressional, groundwater, surface, lake, overbank | | within 100 ft, connected, contiguous, discharges to surface water, channelized, nonchannelized | surface, water table, drift | 0-24 | 0-6 | 0-6 | | |
| LM-99 | No | PEME | No | LRFPTH | depressional, groundwater, surface, overbank, lake | | within 100 ft, nonchannelized, contiguous, connected, discharges to surface water | soil saturation, water marks, water table | | 0-6 | 0-6 | 0-6 | |
| NB-01 | Yes | | Yes | | groundwater, overbank | | within 100 ft, contiguous, connected, discharges to surface water, nonchannelized | soil saturation, water table | | >24 | >24 | | |
| NB-02 | No | PSS1A | No | TEBAIS | depressional, groundwater, surface | | nonchannelized | soil saturation, water marks, water table, water, drift | | >24 | >24 | 0-6 | |
| NB-03 | Yes | | Yes | | groundwater, surface, overbank | | connected, contiguous, discharges to surface water, channelized, nonchannelized | soil saturation, water marks, water table, water | | >24 | >24 | 0-6 | |
| NB-04 | Yes | | Yes | | groundwater, surface, stormwater | | within 100 ft, connected, channelized | surface, soil saturation, water marks, water table | 7-24 | 0-6 | 0-6 | >24 | |
| NB-05 | Yes | | Yes | | groundwater, surface, overbank, other | | within 100 ft, contiguous, discharges to surface water, nonchannelized | soil saturation, water table, crayfish | | >24 | >24 | | |
| NB-06 | Yes | | Yes | | depressional, groundwater, surface, stormwater | | within 100 ft, within 500 ft, connected, discharges to surface water, channelized, nonchannelized | soil saturation, water marks, water table, water, drift, crayfish | | >24 | >24 | 0-6 | |

| Site | Wildlife Habitat Features | Canopy | Size of Connecting Natural Area/ Open Space (ac) | Connectivity Interruptions | Width of Corridor Connection (ft) | Adjacent Land Use | Connectivity Notes | Main Plant Community | Secondary Plant Community | General Vegetation Observations | Littoral Zone Wetland Width (ft) | Diversity | Diversity: Very Low | Diversity: Low | Diversity: High |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | shoreline, other wetlands within 500 ft | Most trees <6 in. dbh or no trees | 51-100 | 0 to 2 | 200+ | Open space | | Emergent (Shallow Marsh) | Scrub-Shrub | Marsh with 25%+ cover by vegetation; potential for erosion | | Low (10-50% cover by non-natives) | | x | |
| DP-02 | other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | <10 ac | 3 to 4 | | Residential, transportation | Contained within small park | Wet Meadow | Scrub-Shrub | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| DP-03 | snags, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Transportation, open space | | Forested | Wet Meadow | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| DP-04 | other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 3 to 4 | 200+ | Agricultural, open space | | Forested | | Dense persistent vegetation | | Dominated by non-natives | x | | |
| DP-05 | snags, woody debris, other wetlands within 500 ft, woodland amphibian breeding pools/nursery | Canopy >6 in. dbh and many large trees >12 in. dbh | >100 | 0 to 2 | 200+ | Residential, open space | | Forested | | Dense persistent vegetation; dense non-persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| DP-06 | woody debris, snags, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Transportation, open space | | Forested | Emergent (Shallow Marsh) | Dense persistent vegetation; dense non-persistent vegetation; marsh with 25%+ cover by vegetation | | High (<10% cover by non-natives) | | | x |
| DP-07 | snags, woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Park, open space | | Emergent (Shallow Marsh) | Forested | Dense persistent vegetation; marsh with 25%+ cover by vegetation | | High (<10% cover by non-natives) | | | x |
| DP-08 | snags, woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space, park | | Wet Meadow | Forested | Dense persistent vegetation | | Dominated by non-natives | x | | |
| DP-09 | snags, woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space, agricultural | | Emergent (Shallow Marsh) | | Dense persistent vegetation; marsh with 25%+ cover by vegetation | | Dominated by non-natives | x | | |
| DP-10 | snags, woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space, residential, transportation | Tile blowout or rills drain to stream from wetland, outlet of McDonald Lake, detention basin outlets to polygon | Scrub-Shrub | Forested | Dense persistent vegetation | | Dominated by non-natives | x | | |
| DP-11 | woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Agricultural, open space | Large regional hub of open space/agriculture | Forested | Wet Meadow | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| DP-12 | other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space | | Emergent (Shallow Marsh) | Deep Marsh | Dense persistent vegetation; marsh with 25%+ cover by vegetation | | Low (10-50% cover by non-natives) | | x | |
| DP-13 | snags, other wetlands within 500 ft | Canopy >6 in. dbh and many large trees >12 in. dbh | >100 | 0 to 2 | 200+ | Residential, open space | | Forested | | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| DP-14 | snags, woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Roadway, open space, commercial-industrial to east | | Forested | Emergent (Shallow Marsh) | Dense persistent vegetation | | Dominated by non-natives | x | | |
| DP-15 | woody debris, other wetlands within 500 ft | Canopy >6 in. dbh and many large trees >12 in. dbh | 51-100 | | 200+ | Open space, residential | | Scrub-Shrub | Emergent (Shallow Marsh) | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| DP-16 | other wetlands within 500 ft | | >100 | 0 to 2 | 200+ | Agricultural | | Farmed Wetland | | Dense non-persistent vegetation | | Dominated by non-natives | x | | |
| DP-17 | snags, woody debris, hummocks, other wetlands within 500 ft, mudflat | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space, residential, agricultural | | Emergent (Shallow Marsh) | Sedge Meadow | Marsh with 25%+ cover by vegetation | | | | | |
| DP-18 | snags, woody debris, woodland amphibian breeding pools/nursery, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space | | Vernal Pool | Forested | Marsh <25% cover by vegetation | | High (<10% cover by non-natives) | | | x |
| DP-19 | snags,woody debris, hummocks, woodland amphibian breeding pools/nursery, other wetlands within 500 ft | Canopy >6 in. dbh and many large trees >12 in. dbh | >100 | 0 to 2 | 200+ | Open space, institutional, transportation | Ryerson Conservation Area | Forested | | Dense persistent vegetation | | High (<10% cover by non-natives) | | | x |
| DP-98 | other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 5+ | 50+ | Open space, transportation | Wetland is adjacent to Bull Creek, part of a wooded/shrubby riparian corridor | Forested | | Dense persistent vegetation; non-marsh closed canopy | | | | x | |
| DP-99 | snags, woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | 25-50 | 0 to 2 | 200+ | Agricultural, institutional | Connection to Bull Creek, surrounded by agricultural fields | Emergent (Shallow Marsh) | | Dense persistent vegetation; marsh with 25%+ cover by vegetation | | Dominated by non-natives | x | | |
| FX-01 | other wetlands within 500 ft | | >100 | 0 to 2 | 200+ | Open space, water | Island in Davis Lake | Deep Marsh | Aquatic Bed | Dense persistent vegetation; marsh with 25%+ cover by vegetation; potential for erosion | | Low (10-50% cover by non-natives) | | x | |
| FX-02 | snags, woody debris, other wetlands within 500 ft, woodland amphibian breeding pools/nursery | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space | | Forested | Emergent (Shallow Marsh) | Dense non-persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| FX-03 | other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space, water, wetlands | Lentic, in lake | Emergent (Shallow Marsh) | Aquatic Bed | Dense persistent vegetation; dense non-persistent vegetation; marsh with 25%+ cover by vegetation; potential for erosion | | Dominated by non-natives | x | | |
| FX-05 | other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space and road right-of-way | | Scrub-Shrub | Wet Meadow | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| FX-06 | snags, woody debris, other wetlands within 500 ft | | >100 | 0 to 2 | 200+ | For open space | | Aquatic Bed | Emergent (Shallow Marsh) | Dense persistent vegetation; dense non-persistent vegetation; marsh with 25%+ cover by vegetation; potential for erosion | 20 | Low (10-50% cover by non-natives) | | x | |
| FX-07 | snags, hummocks, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Forest Preserve, residential | Pedestrian trail to south | Emergent (Shallow Marsh) | Scrub-Shrub | Dense persistent vegetation; marsh with 25%+ cover by vegetation | | Low (10-50% cover by non-natives) | | x | |
| FX-08 | snags, hummocks, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space, residential | | Wet Meadow | Forested | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| FX-09 | hummocks, other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space | | Emergent (Shallow Marsh) | Sedge Meadow | Dense persistent vegetation | | High (<10% cover by non-natives) | | | x |
| FX-10 | snags, hummocks, other wetlands within 500 ft, shoreline | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space, Fox River, residential | | Fen | Scrub-Shrub | Dense persistent vegetation | | Dominated by non-natives | x | | |
| FX-11 | other wetlands within 500 ft | | >100 | 3 to 4 | 200+ | Open space, Fox River | | Aquatic Bed | | Dense non-persistent vegetation; potential for erosion | | | | | |
| FX-12 | other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 50+ | Open space | Honey Lake Drain to Grassy Lake and then Flint Creek | n/a | | | | | | | |
| FX-13 | other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 50+ | Open space, residential | Honey Lake Drain to Grassy Lake and then Flint Creek | Aquatic Bed | | Dense non-persistent vegetation | 20 | High (<10% cover by non-natives) | | | x |
| FX-14 | other wetlands within 500 ft | | >100 | 0 to 2 | 200+ | Agricultural-cropland | | Farmed Wetland | Emergent (Shallow Marsh) | Dense persistent vegetation; dense non-persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| FX-99 | | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space | Tiled to road | Emergent (Shallow Marsh) | Scrub-Shrub | Dense persistent vegetation; dense non-persistent vegetation; marsh with 25%+ cover by vegetation | | Low (10-50% cover by non-natives) | | x | |
| LM-01 | | Most trees <6 in. dbh or no trees | >100 | 3 to 4 | 200+ | Open space, transportation | | Ravine | Emergent (Shallow Marsh) | Dense persistent vegetation; dense non-persistent vegetation | | Dominated by non-natives | x | | |
| LM-02 | woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | | Open space, transportation, Lake Michigan | Road/trail to east | Emergent (Shallow Marsh) | Forested | Dense persistent vegetation; dense non-persistent vegetation; marsh with 25%+ cover by vegetation | | High (<10% cover by non-natives) | | | x |
| LM-03 | woody debris, other wetlands within 500 ft | Canopy >6 in. dbh and many large trees >12 in. dbh | 51-100 | 0 to 2 | 200+ | Open space, transportation | | Forested | Wet Meadow | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| LM-04 | | Most trees between 6-12 in. dbh, a few >12 in. | 25-50 | 5 | 200+ | Open space, park, transportation | Standing pools, no flow, 3-4 ft width, 1-5 ft bank height | Emergent (Shallow Marsh) | Forested | Dense persistent vegetation; dense non-persistent vegetation | | Dominated by non-natives | x | | |
| LM-07 | snags, woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 50+ | Open space, residential | | Seep/Spring | Forested | Dense persistent vegetation; dense non-persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| LM-98 | hummocks, other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space, transportation | | Emergent (Shallow Marsh) | Sedge Meadow | Dense persistent vegetation; dense non-persistent vegetation; marsh with 25%+ cover by vegetation | | High (<10% cover by non-natives) | | | x |
| LM-99 | hummocks, other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space, transportation | | Sedge Meadow | Scrub-Shrub | Dense persistent vegetation | | High (<10% cover by non-natives) | | | x |
| NB-01 | hummocks, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space | | Emergent (Shallow Marsh) | | Dense persistent vegetation | | Dominated by non-natives | x | | |
| NB-02 | other wetlands within 500 ft | Most trees <6 in. dbh or no trees | 25-50 | 0 to 2 | 200+ | Residential, open space, transportation | Part of Oasis Park | Scrub-Shrub | Forested | Dense persistent vegetation | | Dominated by non-natives | x | | |
| NB-03 | woody debris, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | 51-100 | 0 to 2 | 200+ | Open space, transportation, residential | | Forested | Scrub-Shrub | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |
| NB-04 | woody debris, other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 5 | 50+ | Open space, transportation, commercial, residential, institutional | Major riparian corridor, overbanking occurs at 8 ft | Unconsolidated Bottom | Aquatic Bed | | | Low (10-50% cover by non-natives) | | x | |
| NB-05 | other wetlands within 500 ft | Most trees <6 in. dbh or no trees | >100 | 0 to 2 | 200+ | Open space | | Wet Meadow | Emergent (Shallow Marsh) | Dense persistent vegetation; dense non-persistent vegetation; marsh with 25%+ cover by vegetation | | High (<10% cover by non-natives) | | | x |
| NB-06 | snags, other wetlands within 500 ft | Most trees between 6-12 in. dbh, a few >12 in. | >100 | 0 to 2 | 200+ | Open space, transportation, residential | | Scrub-Shrub | Emergent (Shallow Marsh) | Dense persistent vegetation | | Low (10-50% cover by non-natives) | | x | |

| Site | Dominant Plant Species | Notable Plant Species | Rare Plant Observations | Plant Strata | Trees | Saplings | Shrubs | Herbs | Graminoids | Vines | Trees Distribution | Sapling/ Shrub Distribution | Herb Distribution | Ground Cover (%) | Dense | Mod. Dense | Moderate | Mod. Sparse | Sparse | Very Sparse |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | *Typha x glauca, Salix interior, Cyperus esculentus, Echinochloa crus-galli* | *Eleocharis erythropoda, Persicaria amphibia* | | Sapling, shrub, herb, graminoids | | x | x | x | x | | | Dense | | Moderate (51-70%) | | | x | | | |
| DP-02 | Agrostis gigantea, Eleocharis spp. | *Lippia lanceolata, Leersia oryzoides* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Sparse | Dense | Dense (91-100%) | x | | | | | |
| DP-03 | *Phalaris arundinacea, Fraxinus pennsylvanica, Populus deltoides* | *Acer saccharinum, Geum latifolium* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | | Sparse | Dense | Moderate (51-70%) | | | x | | | |
| DP-04 | *Rhamnus cathartica* | *Glyceria striata, Symphyotrichum lateriflorum* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Closed | | Sparse | Moderately Sparse (31-50%) | | | | x | | |
| DP-05 | *Acer saccharinum, Lysimachia nummularia* | *Boemeria cylindrica, Carex grayi, Arisaema dracontium* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Closed | Sparse | Dense | Moderately Dense (71-90%) | | x | | | | |
| DP-06 | Fraxinus spp., Persicaria amphibia, Sium suave | *Sagittaria latifolia, Leersia oryzoides* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Closed | Sparse | Dense | Dense (91-100%) | x | | | | | |
| DP-07 | *Schoenoplectus fluviatilis, Leersia oryzoides, Acer negundo, Acer saccharinum* | *Cephalanthus occidentalis, Cicuta maculata, Cornus obliqua, Menispermum canadense* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Sparse | Dense | Dense (91-100%) | x | | | | | |
| DP-08 | *Phalaris arundinacea, Typha x glauca, Ulmus americana, Rhamnus cathartica, Acer saccharinum* | *Cicuta maculata, Carex lacustris, Carex lupulina, Leersia oryzoides* | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | Dense | Dense | Dense (91-100%) | x | | | | | |
| DP-09 | *Typha x glauca* | | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Sparse | Dense | Moderately Dense (71-90%) | | x | | | | |
| DP-10 | *Rhamnus cathartica, Phalaris arundinacea, Acer negundo* | *Pilea pumila, Apios americana, Ribes americanum* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Dense | Dense | Moderately Dense (71-90%) | | x | | | | |
| DP-11 | *Acer negundo, Phalaris arundinacea* | *Juglans nigra, Eupatorium maculatum* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Closed | | Dense | Moderately Dense (71-90%) | | x | | | | |
| DP-12 | *Typha x glauca, Schoenoplectus fluviatilis, Phalaris arundinacea* | *Polygonum sagittatum, Carex stricta, Phragmites australis ssp. australis, Calamagrostis canadensis, Lythrum salicaria* | rare known | Herb, graminoids | | | | x | x | | | | Dense | Dense (91-100%) | x | | | | | |
| DP-13 | Persicaria virginiana, Rhus radicans, Ulmus spp. | *Carex grayi, Carex muskingumensis, Elymus riparius* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | | Sparse | Dense | Moderately Dense (71-90%) | | x | | | | |
| DP-14 | *Acer saccharinum, Rhamnus cathartica, Phalaris arundinacea* | *Persicaria amphibia* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Dense | Dense | Dense (91-100%) | x | | | | | |
| DP-15 | *Salix nigra, Rhamnus cathartica, Phalaris arundinacea, Typha x glauca* | | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Dense | Dense | Dense (91-100%) | x | | | | | |
| DP-16 | *Zea mays, Cyperus esculentus, Chenopodium album, Setaria viridis* | Corn this season | | Herb, graminoids | | | | x | x | | | | | Moderately Sparse (31-50%) | | | | x | | |
| DP-17 | *Typha x glauca* | *Carex lacustris, Calamagrostis canadensis, Quercus bicolor* | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | Dense | Dense | Moderately Dense (71-90%) | | x | | | | |
| DP-18 | *Carex lupulina, Fraxinus nigra* | *Quercus bicolor, Carya ovata, Sium suave, Cinna arundinacea* | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | Sparse | Sparse | Sparse (11-30%) | | | | | x | |
| DP-19 | *Fraxinus nigra, Carex spp., Cinna arundinacea, Quercus bicolor* | *Carex bromoides, Galium spp., Chenopodium glaucum* | rare known | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Closed | Sparse | Dense | Moderately Dense (71-90%) | | x | | | | |
| DP-98 | *Rhamnus cathartica, Phragmites australis ssp. australis, Lonicera spp.* | | | | x | x | x | x | x | x | Sparse | Dense | Sparse | | | | | x | | |
| DP-99 | Typha angustifolia, Typha x glauca, Salix spp. | | | Trees, sapling, shrub, herb, vines | x | x | x | x | | x | Sparse | Sparse | Dense | Dense (91-100%) | x | | | | | |
| FX-01 | *Typha x glauca* | *Nymphaea odorata* | | Herb | | | | x | | | | | Dense | Moderately Dense (71-90%) | | x | | | | |
| FX-02 | *Rhamnus cathartica, Quercus bicolor, Fraxinus pensylvanica, Boehmeria cylindrica* | *Carex muskingumensis, Cinna arundinacea* | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Closed | | Dense | Moderate (51-70%) | | | x | | | |
| FX-03 | *Typha x glauca* | *Nymphaea odorata* | | Herb | | | | x | | | | | Dense | Moderately Dense (71-90%) | | x | | | | |
| FX-05 | *Salix interior, Rhamnus cathartica, Solidago spp.* | | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Dense | Dense | Dense (91-100%) | x | | | | | |
| FX-06 | *Ranunculus longirostris, Phalaris arundinacea* | *Sparganium eurycarpum* | | Herb, graminoids | | | | x | x | | | | | Moderately Sparse (31-50%) | | | | x | | |
| FX-07 | *Sparganium eurycarpum, Rhamnus cathartica, Phalaris arundinacea, Salix nigra* | *Cicuta bulbifera, Impatiens capensis, Eupatorium maculatum, Sagittaria latifolia* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Dense | Dense | Dense (91-100%) | x | | | | | |
| FX-08 | *Phalaris arundinacea, Fraxinus pensylvanica, Carex spp.* | *Carex stricta, Spartina pectinata, Sium suave, Sparganium eurycarpum, Cephalanthus occidentalis* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Sparse | Dense | Moderate (51-70%) | | | x | | | |
| FX-09 | *Carex spp., Calamagrostis canadensis, Xymphyotrichum lanceolatum, Sparganium eurycarpum* | *Eupatorium maculatum, Sagittaria latifolia, Bidens coronata, Chenopodium glaucum, Onoclea sensibilis, Lythrum salicaria* | rare known | Sapling, shrub, herb, graminoids | | x | x | x | x | | | Sparse | Dense | Dense (91-100%) | x | | | | | |
| FX-10 | Carex spp., Lythrum alatum, Typha x glauca | *Eupatorium perfoliatum, Eupatorium maculatum, Acorus calamus, Solidago ohiensis* | rare known | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | Dense | Dense | Dense (91-100%) | x | | | | | |
| FX-11 | *Ranunculus spp., Lemna spp.* | | | Herb | | | | x | | | | | Dense | Moderately Dense (71-90%) | | x | | | | |
| FX-12 | Unvegetated area | | | | | | | | | | | | | | | | | | | |
| FX-13 | *Nymphaea tuberosa* | *Lemna spp., Ceratophyllum demersum* | | Herb | | | | x | | | | | Dense | Moderately Sparse (31-50%) | | | | x | | |
| FX-14 | *Echinochloa crus-galli, Bidens fondosa* | *Schoenoplectus fluviatilis* | | Herb, graminoids | | | | x | x | | | | Dense | Moderate (51-70%) | | | x | | | |
| FX-99 | *Phalaris arundinacea, Leersia oryzoides, Salix interior* | *Schoenoplectus fluviatilis, Sium suave, Scirpus validus, Asclepias incarnata* | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | | Dense | Moderately Dense (71-90%) | | x | | | | |
| LM-01 | Agrostis gigantea, Lythrum salicaria, Bidens spp. | *Iris virginica shrevei* | | Herb, graminoids | | | | x | x | | | | Dense | Moderately Dense (71-90%) | | x | | | | |
| LM-02 | *Leersia oryzoides, Persicaria amphibia* | *Salix bebbii, Sagittaria latifolia, Sparganium eurycarpum* | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | | Dense | Moderate (51-70%) | | | x | | | |
| LM-03 | *Quercus bicolor, Quercus rubra, Fraxinus pennsylvanica, Glyceria striata* | *Rhamnus cathartica, Carya ovata* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Closed | Sparse | Sparse | Moderately Sparse (31-50%) | | | | x | | |
| LM-04 | *Typha x glauca, Phalaris arundinacea, Bidens frondosa, Ulmus americana* | *Sium suave* | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | | Dense | Moderately Dense (71-90%) | | x | | | | |
| LM-07 | *Impatiens capensis, Phragmites australis ssp. australis* | *Solidago ohiensis, Ribes americanum, Symplocarpus foetidus* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Closed | | Dense | Moderate (51-70%) | | | x | | | |
| LM-98 | *Sparganium eurycarpum, Bidens frondosa* | *Calamagrostis canadensis, Eupatorium maculatum, Carex stricta, Carex lacustris* | | Sapling, shrub, herb, graminoids, vines | | x | x | x | x | x | | Sparse | Dense | Dense (91-100%) | x | | | | | |
| LM-99 | *Carex spp., Spartina pectinata* | *Potentilla palustris, Dryopteris thelypteris pubescens, Betula pumila* | rare known | Sapling, shrub, herb | | x | x | x | | | | | | Dense (91-100%) | x | | | | | |
| NB-01 | *Phalaris arundinacea* | | | Herb, sapling, shrub, graminoids | | x | x | x | x | | | Sparse | Dense | Dense (91-100%) | x | | | | | |
| NB-02 | *Rhamnus cathartica* | | | Trees, sapling, shrub, herb, graminoids | x | x | x | x | x | | Sparse | Dense | Sparse | Moderately Sparse (31-50%) | | | | x | | |
| NB-03 | *Populus deltoides, Rhamnus cathartica, Symphyotrichum lateriflorum* | *Glyceria striata, Carex spp.* | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | | Sparse | Dense | Moderate (51-70%) | | | x | | | |
| NB-04 | *Ceratophyllum demersum* | | | Herb | | | | x | | | | | Sparse | Very Sparse (0-10%) | | | | | | x |
| NB-05 | *Bidens frondosa, Boltonia latisquama recognita, Penthorum sedoides* | *Asclepias incarnata, Cicuta maculata, Acorus calamus* | | Herb, graminoids | | | | x | x | | | | Dense | Dense (91-100%) | x | | | | | |
| NB-06 | *Rhamnus cathartica, Persicaria virginiana, Glyceria striata* | | | Trees, sapling, shrub, herb, graminoids, vines | x | x | x | x | x | x | Sparse | Dense | Dense | Moderately Dense (71-90%) | | x | | | | |

DRAFT

| Site | Interspersion | Evidence of Water Quality Issues | Water Quality Notes | Evidence of Altered Hydrology/Hydrologic Connectivity | Relative Level and Permanence of Disturbance, and Sources | Relative Percent Buffer Disturbance | Relative Percent Wetland Disturbance | Relative: Buffer | Relative: Wetland | Ground Surface/Vegetation Condition of the Wetland | Additional Observations/Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | D | | | overbank flow is not severely altered | buffer, wetland, historic | 6-25 | | 6-25 | | mowing | Muskrat hut, dragonflies, damselflies, gull, sparrow, swallow; soil has 6 in. of organic surface |
| DP-02 | D | Sediment, road runoff | Evidence of bank erosion | stream channel, overbank flow is severely altered, overland flow is severely altered | buffer, wetland, historic | >95 | <5 | >95 | <5 | mowing, human-induced sedimentation or burial, human-induced erosion or exposure | Primary source of hydrology is outflow from Diamond Lake |
| DP-03 | D | Road runoff | | drainage | buffer, historic, recent, wetland | 6-25 | >95 | 6-25 | >95 | | Refine polygon along drainage; ponded portion is deeper than 12 in.; outflow channel excavated through upland but has irregular bed and bank; tree canopy diminished by Emerald Ash Borer beetle; dragonfly, Black-capped Chickadee, woodpecker |
| DP-04 | D | | | overbank flow is not severely altered, stream channel | buffer, recent | | | | | | Mosquitos |
| DP-05 | D | | | overbank flow is not severely altered | buffer | 6-25 | | 6-25 | | | White-tail Deer, toads, hawk, various insects |
| DP-06 | B | Road runoff | | drainage, overbank flow is not severely altered | buffer, historic | >95 | | >95 | | mowing, herbicide | Mosquitos, Garter Snake, woodpeckers |
| DP-07 | D | | | | buffer, historic | 6-25 | | 6-25 | | | Low-flow outflow channel, abandoned meander scar; chipmunk, meadowhawk dragonfly |
| DP-08 | D | | | overbank flow is not severely altered | | | | | | | Many dead trees and reed canarygrass invading; various dragonflies, wasps, woodpecker, damselflies |
| DP-09 | D | | | drainage, open water, overbank flow is not severely altered | buffer, historic | 26-50 | | 26-50 | | | Finches, butterflies, bees, Red-winged Blackbird |
| DP-10 | D | Road runoff, stormwater inputs | Not much road runoff | drainage | historic, buffer | 26-50 | | 26-50 | | | Adjacent stream is high quality for T/E fish and a mapped high quality stream; polygon is adjacent to incised channel approx 2-3 ft; Northern Catbird, American Goldfinch, various insects, small butterflies; wtl boundary is narrower than mapped in LCWIe |
| DP-11 | D | Agricultural runoff, excess nutrients, road runoff | Receives equestrian and cropland runoff | drainage, stream channel, overbank flow is severely altered | buffer, wetland, historic, recent | >95 | 76-95 | >95 | 76-95 | filling, intensive grazing, mowing, soil compaction, vehicle tracks, human-induced sedimentation or burial, selective cutting | Consider analyzing Hydro A adjacent to ditched streams as TEFL; hummingbird, Spicebush Swallowtail butterfly, White-tail Deer, nuthatches, Black-capped Chickadees, dragonflies |
| DP-12 | A | | | water control, constricted, overbank flow is severely altered | buffer, wetland, historic | 6-25 | <5 | 6-25 | <5 | | Monarch butterfly, bees, dragonflies |
| DP-13 | D | | | water control, overland flow is severely altered | buffer, historic | 6-25 | | 6-25 | | | Bumblebee, Blue Jay, honeybee, a few mosquitos, damselflies, cicadas, daddy longlegs |
| DP-14 | D | Road runoff | | stream channel, overbank flow is not severely altered | buffer, historic | 26-50 | | 26-50 | | filling | Deer paths, various songbirds |
| DP-15 | D | | | | buffer, historic | 26-50 | | 26-50 | | | Frogs; ephemeral drainage with shallow water |
| DP-16 | D | Agricultural runoff | | drainage | buffer, wetland, recent | >95 | >95 | >95 | >95 | plowing | Farmed wetland; sparrows, Mourning Doves |
| DP-17 | A | Agricultural runoff, stormwater inputs | | drainage, beavers | buffer, historic, recent | >95 | | >95 | | | Mallards, Canada Goose, snail shells, blackbirds, sparrows; hydrology of this area is significantly affected by beaver dam. |
| DP-18 | C | | | | buffer, historic, recent | <5 | | <5 | | | White-tail Deer remnant, dragonflies, wood duck box, frogs, Blue-spotted Salamander; drain pipes recently installed at outlet point under path |
| DP-19 | D | | | drainage | buffer, historic | <5 | | <5 | | selective cutting, herbicide | Downy Woodpecker, Blue Jay, American crows, white-tail deer tracks; graminoid-dominated understory |
| DP-98 | D | Stormwater inputs, sediment deposits, road runoff | Runoff from path; stormwater outfall enters wtl from basin by public works | channelization, overbank flow severely altered | buffer, wetland, historic | 6-25 | <5 | | | mowing, human-induced erosion or exposure | Point on east bank by Libertyville trail bridge crossing; bank undercutting occurring as a result of stream flow (likely influenced by construction of the bridge crossing's influence on flow). |
| DP-99 | B | Agricultural runoff | | drainage | buffer, historic | >95 | | >95 | | | Direct observations of Tree Swallows, Red-tailed Hawk, Red-winged Blackbird, Eastern Forktail Damselfly, Bumblebee, Common Green Darner dragonfly |
| FX-01 | D | Road runoff, stormwater inputs | | water control | historic | | | | | | ADID 125; Double-crested Cormorant, Great Blue Heron, dragonflies, duck; unable to verify soil with auger |
| FX-02 | D | | | overbank flow is not severely altered | historic | | | | | | Insect array |
| FX-03 | A | Excess nutrients | Noted mats of Eurasian water milfoil, probably affected by watercraft-related total suspended solids on the Chain | water control | historic | | | | | | ADID 48 water quality; island - hydrology source is adjacent lake; Kingfisher, Great Blue Heron, Red-winged Blackbird, fish spp., Mallard, Double-crested Cormorant, Canada Goose |
| FX-05 | D | Road runoff, stormwater inputs | | | buffer, historic | 6-25 | | 6-25 | | | American Robin, dragonflies, mosquitos; presence of State-listed T/E species in the past |
| FX-06 | B | | | water control, constricted | buffer, historic | <5 | | <5 | | | Double-crested Cormorant, Blue-winged Teal, Common Green Darner dragonfly, Blue Dasher dragonfly, Widow Skimmer dragonfly, Black Saddlebags dragonfly, Green Frog, bass, swallows; wind erosion countered by submerged *Ranunculus* spp. in aquatic bed zone during growing season |
| FX-07 | D | | Horse pasture to north but mostly residential, not agricultural | constricted | buffer, recent, wetland, historic | 51-75 | 6-25 | 51-75 | 6-25 | mowing, intensive grazing | ADID 25; could be remnant sedge meadow in areas to southwest; non-native plant management in buffer to the southwest and mowing on north end by residential lands; various dragonflies |
| FX-08 | D | | | drainage | buffer, wetland, historic, recent | 51-75 | 6-25 | 51-75 | 6-25 | herbicide, selective cutting | Monarch & other butterflies, insect array, crayfish; note: amphibian criterion to be revised for LOW so wetlands are not rated HIGH for fish habitat |
| FX-09 | D | | | drainage | historic | | | | | | ADID 65, State T/E plant, INAI site; insect array, Sedge Wren |
| FX-10 | D | | | overbank flow is not severely altered | buffer, historic | 6-25 | | 6-25 | | | Deer tracks, Canada Goose, Herring Gull |
| FX-11 | B | Excess nutrients | | water control, constricted, overbank flow is not severely altered | buffer, wetland, historic | 6-25 | 51-75 | 6-25 | 51-75 | | Blue-wing Teal, Mallards, frogs, damselflies, Great Egret, wood duck boxes, Red-winged Blackbird |
| FX-12 | | Road runoff, stormwater inputs | | water control, constricted, overbank flow is not severely altered | | | | | | | Wood Ducks, swan, dragonfly, bass |
| FX-13 | | Road runoff, stormwater inputs | | water control, constricted, overbank flow is not severely altered | buffer, historic | 51-75 | | 51-75 | | | Wood Ducks, bass, swans |
| FX-14 | D | Agricultural runoff | | drainage | buffer, wetland, recent | >95 | >95 | >95 | >95 | plowing, soil compaction, human-induced sedimentation or burial | 17 in. of sediment above native topsoil in this depression; Red-winged Blackbirds, American Goldfinches, sparrows |
| FX-99 | D | | | drainage | buffer, wetland, historic | 76-95 | >95 | 76-95 | >95 | | Drain tile appears to reduce the duration of hydrology; Black Saddlebags dragonfly, White-faced Meadowhawk dragonfly, other insects |
| LM-01 | C | Stormwater inputs, sediment, road runoff | | constricted | buffer, wetland, historic, recent | >95 | >95 | >95 | >95 | filling, human-induced sedimentation or burial | Channel approx. 5 ft wide with 2-6 ft banks; general pollinators; lotic fringe wetland 5 ft wide on either side, so recommend we narrow down the mapped stream polygon |
| LM-02 | B | Road runoff, stormwater inputs | | drainage, constricted | buffer, wetland, historic | 26-50 | >95 | 26-50 | >95 | human-induced sedimentation or burial, selective cutting, grading | Northern Leopard Frog, insect array; ditched system |
| LM-03 | D | | | constricted | buffer | >95 | | >95 | | selective cutting | White-tail Deer, Gray Squirrel, Northern Cardinal; recent invasive buckthorn cutting |
| LM-04 | D | Stormwater inputs, sediment, water color, road runoff | | drainage, constricted | buffer,historic | >95 | | >95 | | | Buffer mowing, Black-capped Chickadee, butterfly, squirrel |
| LM-07 | D | Road runoff | | drainage | buffer, wetland, historic, recent | 51-75 | 26-50 | 51-75 | 26-50 | grading, mowing, human-induced erosion or exposure | White-throated Sparrow, woodpeckers, White-tail Deer, Skunk, insect array |
| LM-98 | A | Road runoff, stormwater inputs | | drainage, water control, beavers, constricted, overbank flow is not severely altered | buffer, wetland, historic, recent | <5 | >95 | <5 | >95 | herbicide, human-induced sedimentation or burial | Monarch butterfly, Turkey Vulture, Great Blue Heron; White-tail Deer, frog, dragonfly |
| LM-99 | D | | | overbank flow is not severely altered | buffer, wetland, historic | 6-25 | <5 | 6-25 | <5 | | Hydrology of dunes is influenced by declining Lake Michigan water level in recent history; sulfur moth, insect array, Coopers hawk, American goldfinch |
| NB-01 | D | | | stream channel, overbank flow is severely altered, drainage | historic | | | | | | Dragonflies, Monarch butterfly |
| NB-02 | D | | | | buffer, historic | 26-50 | | 26-50 | | | 6-in. snags, insects |
| NB-03 | D | Road runoff | Runoff from I-94 | drainage, overbank flow is not severely altered | buffer, wetland, historic | 51-75 | 6-25 | 51-75 | 6-25 | selective cutting | Woodpecker, various insects |
| NB-04 | C | Point source, stormwater inputs, sediment, road runoff, excess nutrients | Impaired water | stream channel | buffer, wetland, historic, recent | 51-75 | >95 | 51-75 | >95 | | 0.5 cfs flow, 20-25 ft wide, historically channelized system; small fish, Black Saddlebags dragonfly, Ebony Jewelwing damselfly |
| NB-05 | D | | | drainage, overbank flow is severely altered, stream channel | buffer, wetland, historic, recent | <5 | <5 | <5 | <5 | grading | Swallowtail and Monarch butterflies, ducks, various dragonflies, wren; direct precipitation = other source of hydrology but primarily hydrated by over bank flooding; past observations of State-listed T/E spp. |
| NB-06 | D | Road runoff | | drainage, stream channel | buffer | <5 | | <5 | | | White-tail Deer, various dragonflies, finches; consider splitting polygon into EM and SS |

Functional Assessment

| Site | Flood Water Storage/ Surface Detention | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Stream Baseflow Maintenance | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Native Fish Habitat | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Waterfowl Habitat | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Other Wetland-Dependent Bird Habitat | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | High | FEMA 100 | | N/A | | | Low | All remaining wetlands, adjacent to lake rated moderate | | High | PEMC | | High | PEMC | |
| DP-02 | High | FEMA 100 | | Moderate | LS & PEMAd | | Low | Contiguous to LS TH, appears perennial | | Low | Non-slope wetland | | Moderate | PEMAd | |
| DP-03 | Low | All remaining wetlands | | N/A | | | N/A | | | Low | All remaining wetlands | | Low | All remaining not open water | |
| DP-04 | High | FEMA 100 | | Moderate | LS, Hydro A | | N/A | | | Low | All remaining wetlands | | Low | All remaining wtls | |
| DP-05 | High | FEMA 100 | | Low | LRFPba | | Moderate | LRFPb | | Moderate | PFO1C | | Low | PFO1C | |
| DP-06 | High | FEMA 100 | | Low | LR | | Moderate | LRFPba | | Moderate | PFO1C | | Low | All remaining wetlands | |
| DP-07 | High | FEMA 100 | | Low | LR | | Moderate | Fpba | | High | PEM/FO1C | | High | EMC | |
| DP-08 | High | FEMA 100 | | Low | LR | | Moderate | LRFPba | | Moderate | PEM/FO1C, with the forested community dominant | | High | PEM/FO1C | |
| DP-09 | High | FEMA 100 | | High | LS floodlain, Hydro C | | Moderate | Hydro C, touches water body rated HIGH | | High | PEMCd | | High | PEMCd | |
| DP-10 | High | FEMA 100 | | High | LSFP - Hydro C | | Moderate | Hydro C, adjacent stream is high | | Moderate | PEM/SS1C | Suggest dropping LSFP to MODERATE when Hydro = C | High | PEM/SS1C | |
| DP-11 | High | FEMA 100 | | Moderate | LS, Hydro A | | Low | Hydro A, adjacent to stream rated high | | Low | All remaining wetlands with Hydro A | | Low | Not open water type | |
| DP-12 | High | FEMA 100 | | Low | TEBAOU | consider size, proximity and organic soil as increasing the function level | Low | All remaining wetlands, contiguous | | High | PEMC | Consider HIGH= PEMC adjacent to waterbody, with MODERATE = PEMC not adjacent to waterbody | Moderate | PEMC | See previous issues with lumping in this category. |
| DP-13 | High | FEMA 100 | | Low | LR | | Low | Contiguous to Des Plaines River | | Low | PFO1A | | Low | PFO1A | |
| DP-14 | High | FEMA 100 | | High | LS, Hydro C | | Low | LSFP, Hydro C | | Moderate | PFO, Hydro C | | Low | All remaining wetlands, non open water | |
| DP-15 | Low | Remaining wetlands including slough | | N/A | | | N/A | | | Moderate | PEM/SS1C | | High | PEM/SS1C | |
| DP-16 | High | Depressional FP, TEBA >0.75 ac-ft storage | | N/A | | | N/A | | | Low | All remaining wetlands, Hydro A | | Low | All remaining wetlands, not open water type | |
| DP-17 | High | FEMA 100 | | Moderate | Headwater wetland ditched | | Low | All remaining wetlands, Hydro C or wetter, adjacent to rated stream | | High | PEMC | | High | PEMC | |
| DP-18 | Low | Remaining wetland is not Slope | | N/A | | | N/A | | | Moderate | PFO1C | | Low | PFO1 | |
| DP-19 | Moderate | TEFL outside floodplains | | Low | Through-flow wetland connected to stream | | N/A | | | Low | PFO1C | Recommend LOW based on PFO1C except Flat outside floodplain | Low | All remaining vegetated wetlands | |
| DP-98 | High | Proximity to source for flood waters | | Moderate | LS, NWI=A | | Low | Contiguous but not semi-permanently flooded (hardly flooded, and narrow) | should this be low, or n/a? | Low | SS/FO, temporary flooding; maybe some wood ducks, mallards | Adjust category so that FO/SS areas with A/B hydrologic regime = LOW, not MODERATE | Low | forested, temporarily flooded | |
| DP-99 | High | Topography on all sides increases by 3-4 ft | | N/A | | | N/A | | | Moderate | Too much vegetation:open water to be HIGH, seasonally flooded, Wood Ducks observed historically | Ranks HIGH per criterion, check with TAG about adding interspersion | High | Wood Ducks in past, EM/SS with seasonal/temporary hydrologic regime | TAG: Should size threshold be added? This site provides habitat, but not like Almond Marsh |
| FX-01 | High | FEMA 100 | | Low | LE associated with Lake rated HIGH | | Moderate | Contiguous to impounded lake, PEMFh | | High | PEMFh | | High | IL | |
| FX-02 | High | FEMA 100 | | N/A | | | N/A | | | Low | PFO1A | | Low | All remaining wetlands | |
| FX-03 | High | FEMA 100 | | Low | LEIL adjacent to lake = HIGH | | Moderate | Hydro F, adjacent to perennial channelized stream | | High | PEMFh | | High | PEMFh | |
| FX-05 | Low | Slough wetland | | Low | Outflow connected to stream | | N/A | | | Moderate | PSS1C | | High | PSS1C | |
| FX-06 | High | FEMA 100 and restricted outlet and TI pond | | Low | TI pond | | Moderate | Need to check in detail with list of functions | | Moderate | artificial pond due to impoundment of drainage | | Low | Not much shoreline; mostly aquatic bed. Seem like this could be rated MODERATE. | Do pre-research on water bodies to see if artificial pond veg AB |
| FX-07 | High | This is a Lake County regulatory floodplain | | N/A | | | N/A | | | Moderate | PEMC | Revise criterion to remove emergent unless semipermanent water regime. Change from HIGH to MODERATE. | High | PEM/SS1C | |
| FX-08 | High | FEMA 100 | | Low | TEBHTH | | N/A | | | High | PEMC | | High | PEMC | |
| FX-09 | High | FEMA 100 | | Low | TH wetland to lake and stream system | | N/A | | | Low | All remaining wetlands | | Low | All remaing wetlands | |
| FX-10 | High | FEMA 100 | | N/A | | | Low | LRFPTH touches riverine polygon | | High | PEM/SS1D | Change to HIGH-- add Hydro D; HIGH = Hydro C or wetter | High | PEM/SS1D | Change to HIGH - add Hydro D (i.e., HIGH = Hydro C or wetter) |
| FX-11 | High | FEMA 100 | | Moderate | LRFPOUPD | | Low | All remaining water bodies | | High | PAB | | Moderate | LRFPOUPD3hx | |
| FX-12 | High | FEMA 100 | | Low | LK TH | | High | Natural lake with dam | | High | Natural lake | | N/A | | |
| FX-13 | High | FEMA 100 | | Low | LK TH | | High | Contiguous to named INAI water body | | High | AB | | Low | L2AB | |
| FX-14 | High | FEMA 100, TEBAIS >0.75 ac-ft storage | | N/A | | | N/A | | | Low | All remaining wetlands | | Low | All remaining wetlands | |
| FX-99 | High | TEBAIS, >0.75 ac-ft storage | | N/A | | | N/A | | | High | PEMC | | High | PEM/SS1C | |
| LM-01 | Moderate | LSST, ravine | | N/A | | | N/A | | | Low | Intermittent stream | MODERATE should have Hydro C and subsystem 4 (R4 with Hydro A = LOW) | N/A | | |
| LM-02 | High | FEMA 100 | | N/A | | | Low | All remaining waterbodies | | Moderate | ST, Hydro C | Function rated based on field revisions; otherwise, would have been N/A | N/A | | |
| LM-03 | Low | TEBATH | | N/A | | | N/A | | | Moderate | PFO1C | | Low | All remaining wetlands | |
| LM-04 | Low | Slough, TEBAsl | | Low | TH connected to stream, eventually | | N/A | | | Moderate | PEMC | Doesn't work as HIGH. Need to review more closely. Ditching is issue and lack of interspersion. Seems more MODERATE to LOW for this function. Maybe exclude sloughs that are not associated with floodplain | Moderate | PEM/FO1c | Seems more LOW or MODERATE because of the lack of interspersion and narrow width; seems only good habitat for Red-winged Blackbirds |
| LM-07 | Low | FEMA 100 | Recommend LOW for Slope wetlands within FEMA 100 or 500 floodplain | High | Slope wetland within 50 ft | | N/A | | | N/A | | | Low | All remaining wetlands not open water | |
| LM-98 | High | FEMA 100 | | Low | TH | Add any wetlands adjacent to stream polygon | High | Adjacent to stream in INAI, and PEMF | Suggest droppingthe INAI criterion for water bodies | High | PEMF | | High | PEMF | |
| LM-99 | High | FEMA 100 | | Low | LR | | Moderate | PEME contiguous to water body | | High | PEME contiguous to river | | High | LM coastal wetlands, PEME | |
| NB-01 | High | FEMA 100 | | Moderate | LS and A regime | | N/A | | | Low | PEMA | | Moderate | PEMA - need to delete temporary hydrology from HIGH function | |
| NB-02 | Moderate | TEBAIS | | N/A | | | N/A | | | Low | All remaining wetlands | | Moderate | PSS1A | Remove temporarily flooded condition from HIGH |
| NB-03 | High | Intersects FEMA 100 | | Low | TEFLTH | | N/A | | | Low | PFO1A | | Low | All remaining wetlands | |
| NB-04 | High | FEMA 100 | | N/A | | | Low | Channelized stream with barrier | | Moderate | R2UBH | Change to MODERATE, with River only being HIGH (not Streams) | N/A | | |
| NB-05 | High | FEMA 100 | | Moderate | LS, NWI=A | | Low | LS,TH | | Moderate | All remaining wetlands - PEMA | Consider temporarily flooded emergent in MODERATE | Moderate | PEMA | |
| NB-06 | High | TEBA >0.75 ac-ft storage, partly in FEMA 100 | | Low | TEBATH connected to MF stream system | | Low | PEM/SS1 contend to pond/mudflat, possibly n/a based on only ditch connection | | Moderate | PSS1C predominant | | High | PEM/SS1C | |

| Site | Woodland Amphibian Habitat | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Unique Wetland Resources | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Stream Shading | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Wildlife Movement Corridor (Riparian Habitat) | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Nutrient Transformation (Phosphorus) | Field Observation to Support Function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | N/A | | | N/A | | | N/A | | | High | PEM, 200 ft corridor | | High | PEMC, PSS1C |
| DP-02 | N/A | | | N/A | | | Low | PEMAd | | Low | All remaining wetlands | | Moderate | PEMAd |
| DP-03 | N/A | | | N/A | | | N/A | | | High | PFO1/EM, 200 ft corridor | | Moderate | PFO1/EMAd |
| DP-04 | Low | Remaining woodland wetland, perennial and no fish | | N/A | | | N/A | | | Moderate | PFO, 200 ft corridor with 2-5 interruptions | | Moderate | PFO1A |
| DP-05 | Moderate | Wooded wetland with small vernal pool; suggest a rating increase to at least MODERATE, independent of native fish habitat | | N/A | | | N/A | | | High | FO1C, 200 ft corridor | | High | PFO1C |
| DP-06 | Low | PFO1C | All remaining wooded wetlands should fall under LOW; not HIGH for fish | N/A | | | N/A | | | High | PFO1C, 200 ft corridor | | High | PFO1C |
| DP-07 | Moderate | PEM/FO1C | | N/A | | | Low | PEM | Tag: Should EM/FO complex bump up rating? | High | Broad unbroken corridor | | High | PEM/FO1C |
| DP-08 | Low | wooded wetlands not HIGH or MODERATE | | N/A | | | High | Forested within 50 ft | | High | PEM/FO1C | | High | PEM/FO1C |
| DP-09 | N/A | | | High | INAI Site, ADID Site 44, State T/E species (fish, bird) | | Low | PEM, <50 ft of stream | | High | PEMCd, 200 ft corridor | | High | PEMCd |
| DP-10 | Low | PEM/SS1C and MODERATE fish habitat | | High | ADID 32-shoreline stabilization, nutrient removal, sediment retention | | Moderate | PEM/SS1C | | High | Vegetated wetlands, 200 ft corridor | | High | PEM/SS1C |
| DP-11 | Low | PFO1, LS; not HIGH fish habitat in polygon | | N/A | | | High | PFO1 <50 ft from ST | | High | PFO1/EM, 200 ft corridor | | Moderate | PFO1/EMA |
| DP-12 | N/A | | | High | INAI site, ADID Site 60, State T/ E species (birds, plant) | | Low | EM within 50 ft | | High | Vegetated wetland, 200 ft corridor | | High | PEMC |
| DP-13 | Low | PFO | | N/A | | | High | PFO1A adjacent to Des Plaines River | | High | FO and LR | | Moderate | PFO1A |
| DP-14 | Low | LS, PFO | | N/A | | | High | PFO within 50ft of stream | | High | Vegetated wetland, 200 ft corridor | | High | Vegetated wetland, Hydro C |
| DP-15 | N/A | | | N/A | | | N/A | | | High | PEM/SS1, 200 ft corridor | | High | Vegetated wetland, Hydro C |
| DP-16 | N/A | | | N/A | | | N/A | | | High | Vegetated wetland, 200 ft corridor | | Moderate | TEBAIS, farmed |
| DP-17 | N/A | | | N/A | | | Low | Emergent wetland within 50 ft of stream | | High | Vegetated wetland, 200 ft corridor | | High | PEMC |
| DP-18 | High | Vernal pool and 500 ft | | High | Ephemeral (vernal) pool | | N/A | | | High | Vegetated wetland, 200 ft corridor | | High | PFO1C |
| DP-19 | Low | All remaining wooded wetlands | Recommend HIGH for PFO1 class with vernal woodland modifier | High | INAI site, ADID 176, State T/E species - plants | | N/A | | | High | Vegetated wetland, 200 ft corridor | | High | PFO1C |
| DP-98 | Low | NCIP map appears to show moderate to high | NCIP map is coarser in scale and is for a wider array of amphibians, not just woodland amphibians. TAG: does criteria benefit from using NCIP map or not? | High | ADID/HQAR 105 | | High | forested wetland within 50 ft. of stream | | High | long continuity, even with interruptions | | Moderate | PEM with NWI=A |
| DP-99 | N/A | | | N/A | | | N/A | | | High | Broad agricultural corridor connecting to Bull Creek | TAG: Allow agricultural/park/mowed as corridor or just "natural" areas? | High | Vegetated wetland, Hydro C |
| FX-01 | N/A | | | High | ADID 125 | | N/A | | | Moderate | Vegetated wetland connects to other wetlands | Tag: Add IL to LOW? | High | PEMFh |
| FX-02 | Low | All remaining wooded wetlands | | N/A | | | N/A | | | High | PFO, 200 ft corridor | | Moderate | PFO1A |
| FX-03 | N/A | | | High | ADID | | Low | PEM within 50 ft of LS polygon | Move LE wetlands to N/A | High | PEMF, 200 ft corridor | | High | PEMFh |
| FX-05 | N/A | | | High | INAI site - McLean; State T/E species | | N/A | | | High | PSS1C | | High | PSS1C |
| FX-06 | Low | Fish habitat is MODERATE | | N/A | | | N/A | | | Moderate | AB broad corridor | | Low | PUB |
| FX-07 | N/A | | | High | ADID site | | N/A | | | High | Lots of open space | | High | PEMC |
| FX-08 | N/A | | | N/A | | | N/A | | | High | PEM/FO1C, 200 ft corridor | | High | PEMC |
| FX-09 | N/A | | | High | INAI, ADID Site 65-Biological & Hydrology functions, State T/E species-plants | | N/A | | | High | PEM, 200 ft corridor | | Moderate | PEMB |
| FX-10 | Low | All remaining wooded/shrub wetlands | | High | Part of ADID 147, INAI site, State T/E species - plant | | Moderate | PEM/SS1 within 50 ft along LR | | High | PEM/SS1, 200 ft corridor | | High | PEM/SS1 |
| FX-11 | N/A | | | High | Part of ADID 147, INAI site, State T/E species - plant | | N/A | | | Low | PAB, 200 ft corridor with 3-4 interruptions | | High | PABG |
| FX-12 | N/A | | | High | ADID 167, INAI site - Honey Lake complex | | N/A | | | Low | Open water community | | Low | Open water in lake |
| FX-13 | N/A | | | High | ADID 167, INAI site - Honey Lake complex | | N/A | | | Moderate | AB connected by broad corridor | | High | PAB |
| FX-14 | N/A | | | N/A | | | N/A | | | High | PEM, 200 ft corridor | | Moderate | TEBA, farmed wetland |
| FX-99 | N/A | | | N/A | | | N/A | | | High | PEM/SS, 200 ft corridor | | High | PEM/SS1C |
| LM-01 | N/A | | | N/A | | | N/A | | | Low | All OW portions unvegetated stream | | Low | OW in rivers |
| LM-02 | N/A | | | High | ADID Site 9, INAI, State T/E plants | | N/A | | | Low | Qualifies as N/A | Consider intermittent streams as MODERATE or LOW, with criteria to be determined based on width/hydro regime | Low | All other polygons |
| LM-03 | N/A | | | N/A | | | N/A | | | High | PFOC, 200 ft corridor | | Low | All remaining polygons |
| LM-04 | N/A | | | N/A | | | N/A | | | Low | All remaining wetlands, no connection to other wetlands | | Moderate | PEM/FO1C |
| LM-07 | Low | All remaining wooded wetlands associated with stream | | High | Hillside seep associated with ravine feature | | High | PFO1 within 50 ft of stream | | Moderate | Vegetated wetland, 50 ft corridor with < 5 interruptions | | Low | All remaining polygons |
| LM-98 | N/A | | | High | ADID, RAMSAR site, etc. | | Low | EM within 50 ft of stream | | High | PEM, 200 ft corridor | | High | PEMF |
| LM-99 | N/A | | | High | ADID Site 9, INAI, State T/E bird, reptiles, insect, plant | | Low | PEM within 50 ft of river | | High | PEM, 200 ft corridor | | High | PEME |
| NB-01 | N/A | | | N/A | | | N/A | | | High | vegetated wetland, 200 ft corridor | | Moderate | PEMA |
| NB-02 | N/A | | | N/A | | | N/A | | | High | SS, 200 ft corridor | | Moderate | PSS1A |
| NB-03 | N/A | | | N/A | | | N/A | | | High | PFO, 200 ft corridor | | Moderate | PFOA |
| NB-04 | N/A | | | N/A | | | N/A | | | Low | R2UB | | Low | R2UBH |
| NB-05 | N/A | | | High | INAI | | Low | PEM, 50 ft | | High | PEMA, 200 ft corridor | | High | PEMA |
| NB-06 | N/A | | | N/A | | | N/A | | | High | Vegetated, 200 ft corridor | | High | PEM/SS1C |

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| Site | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Sediment and Other Particulate Retention | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Shoreline/ Streambank Stabilization | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations | Carbon Sequestration | Field Observation to Support Function | Recommended Changes to Preliminary Wetland Functional Assessment Criteria Based on Field Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| DP-01 | | High | FR associated with lake, LEFR | | Moderate | LEFR, 10-20 ft wide polygon on average | | Moderate | PEM/C on mineral hydric soil | |
| DP-02 | | Moderate | LSFRTH | | Moderate | <10 ft vegetated wetland on body stream | | Low | PEM/A4 | |
| DP-03 | | High | TEBAIO | | N/A | | | Moderate | PFO1/EM/Ad | Consider revisions related to FO-dominated moves being MODERATE |
| DP-04 | | High | FP | | N/A | | | Moderate | PFO1A | |
| DP-05 | | High | FP | | N/A | | | High | PFO1C on mineral soil | |
| DP-06 | | High | FP | | N/A | | | High | PFO1C on mineral soil | |
| DP-07 | | High | FP | | High | LR | Add LR to criteria | Moderate | PEM/FO1C on mineral hydric soil | |
| DP-08 | | High | FP | | N/A | | Recommend rating increase for LR | Moderate | PEM/FO1C | |
| DP-09 | | High | LSFP | | High | PEMC, 10 ft, adjacent to stream | | Moderate | PEMC on mineral hydric soil | |
| DP-10 | | High | LSFP | | High | LS, > 10 ft | | Moderate | Other wetland with mineral soil | |
| DP-11 | | High | LSFP | | High | PFO1/EM, >10 ft, adjacent to stream | | Moderate | PFO1/EMA | Look at moves FO-dominated wetland polygons MODERATE |
| DP-12 | | Moderate | TEBAOU artificial | | Moderate | TE, adjacent to pond | | High | All vegetated wetlands on organic soil, not drained or ditched | |
| DP-13 | | High | FP | | Low | Field observations do not support selection criteria | Add cluvio to all criteria | Moderate | PFO1A | |
| DP-14 | | High | LSFP | | High | Vegetated wetland, 10 ft, along stream | | Moderate | Vegetated wetland on mineral hydrocarbon, Hydro C | |
| DP-15 | | Low | All remaining wetlands | | High | | | Moderate | Vegetated wetland on mineral soil hydrocarbon, Hydro C | |
| DP-16 | | High | TEBAIS | | N/A | | | Low | | |
| DP-17 | | Moderate | TEBAOU | | Moderate | TEBAOU/fire | | Moderate | Vegetated on organic soil, drained | |
| DP-18 | Change to LOW for all TEBAoo | Moderate | TEBAOU | | N/A | | | Low | PFO1C | Change to LOW - exclude vernal pool from HIGH; add vernal pool to LOW - cvc modifier |
| DP-19 | | Low | All remaining wetlands | | N/A | | | High | PFO1C on mineral hydrocarbon soil | |
| DP-08 | | High | FP position | | High | vegetated wetland of >10 ft (pin flamingo) located along a water body | | Moderate | PFO on mineral soil and Hydro A | |
| DP-09 | | High | TEBAIS, good ability to capture/hold sediments/particulates | | N/A | | | Moderate | Vegetated, with mineral soil and Hydro A | |
| FX-01 | | High | LE IL | | Low | LE IL | | Moderate | Assume organic soil | |
| FX-02 | | Low | All remaining wetlands | | N/A | | | Moderate | PFO/EM, with mineral hydric soil | |
| FX-03 | | High | LE IL | | Low | IL | | Low | Other vegetated wetlands | |
| FX-05 | | Moderate | TEBAOU | | N/A | | | High | PSS1C | |
| FX-06 | | Moderate | TI Level | | Moderate | Remaining wetland around water bodies | Add Pond with shoreline vegetation, not just lake in MODERATE category | High | PA | |
| FX-07 | | Moderate | | | Moderate | TEBAOU/fire | | Moderate | Other vegetated wetlands on mineral soil and Hydro C | |
| FX-08 | | Low | All remaining wetlands - suggest TEBATI be added at MODERATE | | N/A | | | Moderate | Other wetlands on mineral hydric soil | |
| FX-09 | | Low | All remaining wetlands | | N/A | | | Moderate | Organic soil, ditched--appears to have minor overall effect on sequestration | |
| FX-10 | Change to HIGH - add Hydro D; HIGH = Hydro C or wetter | High | LRFP | | High | PEM/SS/I, 10 ft, adjacent to LR | | High | All vegetated wetlands on organic soils | |
| FX-11 | | High | LRFP | | N/A | | | High | PAB | |
| FX-12 | | Low | All remaining water bodies | Add water bodies to LOW criterion | N/A | | | N/A | | |
| FX-13 | | Low | All remaining wetlands | | High | Veg wt >20 ft, along water bodies | | High | L2AB | |
| FX-14 | | High | | | N/A | | | Low | All remaining wetlands | |
| FX-09 | | High | TEBAIS | | N/A | | | Moderate | PEM/SS1C on mineral soil | |
| LM-01 | | Low | Water body, stream | | N/A | | | N/A | | |
| LM-02 | | Low | All remaining | | Low | N/A based on criteria | Consider adding intermittent streams/SB class to LOW | Low | Qualifies as N/A | Consider adding R4SB as LOW |
| LM-03 | | Low | All remaining polygons | | N/A | | | High | PFO1C | |
| LM-04 | Consider 'ditching' modifier as reducing function to MODERATE | Low | TH | | N/A | | | Moderate | PFO1C | |
| LM-05 | Add Wetlands to LOW criteria | Low | All remaining wetlands | | N/A | | | High | All remaining wetlands | Add Hydro D to H2 mapping code; Crosswalk place wetlands rate as HIGH |
| LM-08 | | High | LEBA | | High | PEM, 10 ft | | Moderate | PEM on organic soil, ditched | |
| LM-09 | | High | LRFP | | High | PEM, 10 ft | | Moderate | PEM/E on mineral hydric soil | |
| NB-01 | | High | LSFP | | N/A | | | Low | PEMA | |
| NB-02 | | High | TEBAIS | | N/A | | | Moderate | PSS1A | |
| NB-03 | | Low | All remaining wetlands | | N/A | | | Moderate | PFO1A | |
| NB-04 | | Low | All remaining water bodies | | N/A | | | N/A | | |
| NB-05 | | High | FP wetland, LSFP | | High | Vegetated wetland on water body river, >10 ft | | Moderate | Other vegetated wetlands | |
| NB-06 | | Low | All remaining wetlands | | N/A | | | Moderate | PEM/SS1C | |

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# APPENDIX C

## *DECISION SUPPORT TOOL DEVELOPMENT DETAILS*

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# APPENDIX C DECISION SUPPORT TOOL DEVELOPMENT DETAILS

## INTRODUCTION

The Lake County Stormwater Management Commission (SMC) project team wished to develop a tool that would support access to data from the Lake County Wetland Restoration and Preservation Plan (WRAPP) by the general public and support planning of potential wetland restoration and preservation projects. To that end, they designed the WRAPP Decision Support Tool (DST) to provide a wide audience of end users with an easy-to-use interactive mapping tool to assist in identifying and prioritizing wetland restoration or preservation opportunities in Lake County, Illinois. The DST integrates geospatial data developed specifically for the WRAPP with other geospatial datasets to support the end user in planning-level decision-making.

### Platform

The first step in DST development was to determine an appropriate platform on which to build the tool. Because the DST would be interactive, the project team preferred a web-based platform, with three general requirements. The platform must be 1) available for use by the general public, 2) maintainable (i.e. updated or edited), and 3) widely compatible across various software packages. After reviewing several options, the planning team determined that the DST should be developed as an ESRI ArcGIS Online Web Mapping Application ("WebApp"). This platform was readily available to SMC project staff and allows virtually anyone with an internet connection to access and interface with the data in a dynamic mapping environment. Additionally, the Lake County Department of Information Technology, GIS Division was already using an ArcGIS Online WebApp as Lake County's public online mapping service, so using the same application provides consistency for end users already familiar with the Lake County application.

### Tool Development

The SMC project team brainstormed about the desirable types of features and functionality in the DST (see **WRAPP Decision Support Tool Concept Design Chart**). They culled the initial list based on the density and variety of data practical to include in a final product. As the project team developed the initial beta version of the DST, they revised certain functional elements based on the capabilities of the ArcGIS Online platform. Ultimately, the team determined that the DST should be built on an "off-the-shelf" mapping application rather than creating a more complicated, customized application. This will allow greater ease of future updates and provide end users the opportunity to use an interactive mapping application but would not necessitate a significant level of effort to build and maintain a customized application.

The Existing Wetland Inventory-Lake County (EWI-LC) and Potentially Restorable Wetlands (PRW) geographic data layers are the main data products developed for the WRAPP and consequently are the focus of the DST. Because of their importance, the project team felt that the end user should be able to view the layers in different ways. The EWI-LC polygons can be viewed as a layer symbolized according to their designation as a "wetland" or "water body" polygon under the Landscape Position, Landform, Water Flow Path and Waterbody Type (LLWW) classification system (see **Appendix A.4**), with "wetland" polygons symbolized in green and "water body" polygons (i.e., lakes, rivers, streams, and ponds) symbolized in blue. The PRW polygons can be viewed as a layer symbolized according to size in shades of purple, broken in to ranges of <1 acre, 1-5 acres, and >5 acres.

Because the assessment of wetland function was a key analytical component of the WRAPP, the project team also felt end users should have the option of viewing the EWI-LC and PRW datasets based on predicted level of functional significance for each of the 13 evaluated functions. Therefore, the tool has an additional 26 layers (i.e., 13 functions each for the EWI-LC and PRW databases) that show predicted level of functional

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significance (High, Moderate, Low, N/A) in shades of orange and yellow.

The project team also included locations of the 48 field study sites visited by the team and TAG in the DST. SMC created information sheets summarizing the data collected at each location with a representative photograph of the study site (see **Appendix B.3**). The sheets are linked within the DST so that users can easily click on a study site location and view the Information Sheet.

The DST also includes additional geographic data, or "information layers." From the initial list of potential data layers, the project team ultimately arrived at the list identified in **Table C.1**. These layers provide additional information to end users viewing the EWI-LC and PRW data within the DST.

"Basemaps," the background layers of the map view within the DST, consist of several cartographic options provided by ESRI (these include streets, water features, municipality labels, state and county boundaries, and landmarks) as well as a sequence of Lake County aerial photography dating to 1939.

When finished, the project team and Technical Advisory Group beta tested the DST prior to launch. Periodic updates are envisioned to occur as needed or in concert with updates to the WRAPP.

**Table C.1. Information Layers and Base Maps Included in the DST.**

| Name | Source |
|---|---|
| Lake County Boundary | Lake County Dept. of IT, GIS Division |
| Major Watersheds | Lake County Stormwater Management Commission |
| HUC 12 Basins | Lake County Dept. of IT, GIS Division |
| SMC Sub-Watersheds | Lake County Stormwater Management Commission |
| Drainage Districts | Lake County Dept. of IT, GIS Division |
| Township Boundaries | Lake County Dept. of IT, GIS Division |
| Municipal Boundaries | Lake County Dept. of IT, GIS Division |
| Unincorporated Places | Lake County Dept. of IT, GIS Division |
| Forest Preserves | Lake County Dept. of IT, GIS Division |
| Parks and Open Space | Lake County Dept. of IT, GIS Division |
| Tax Parcels (Property Boundaries) | Lake County Dept. of IT, GIS Division |
| Flood Hazard Zones | Federal Emergency Management Agency |
| Base Flood Elevations | Federal Emergency Management Agency |
| Levees | Federal Emergency Management Agency |
| Flood of Record | United States Geological Survey |
| Hydrology – Linear Connections | Lake County Dept. of IT, GIS Division |
| Hydrology – Open Waters | Lake County Dept. of IT, GIS Division |
| Land Use 2010 | Lake County Dept. of Planning, Building, & Development |
| Soils – 2004, Hydric | Natural Resources Conservation Service |
| Soils – 2004 | Natural Resources Conservation Service |
| Soils – 2004, point symbols | Natural Resources Conservation Service |
| Transportation – Roads | Lake County Dept. of IT, GIS Division |
| Transportation – Trails | Lake County Dept. of IT, GIS Division |
| Topography – 1 ft Contours | Lake County Dept. of IT, GIS Division |
| Wetlands – Advanced Identification Study (ADID) | Lake County Dept. of IT, GIS Division |

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February 14, 2018

# WRAPP Decision Support Tool Concept Design Chart

INTRO PAGE: WRAPP description, disclaimer, LAUNCH MAP TOOL click

MAP TOOL HOME PAGE: 1. Basic Instructions; 2. Map of Lake County on Topo Base; 3. **Select Area of Interest**: like Maps Online - Search Box field stating "*Select Area of Interest or Zoom in Map*" that allows user options to type in their known area, use magnifying glass to search for named location, or choose from the drop-down list with the following selections: **Major Watersheds; HUC-12 Watersheds; Townships; Municipalities; Parks & Open Space; Forest Preserves; Drainage Districts; Tax Parcels; Tax ID/PIN #, Lat/Long Coord, Other??**

WORKING MAP PAGE: Tool Bar at top right similar to Maps online with BASE MAPS, MEASURE TOOL, PRINT, etc.

1. Shows boundary of selected area of interest on topo base map
2. General menu field next to map entitled: "I AM INTERESTED IN" with two main datasets to choose from (allow one OR both layers to be chosen & displayed): "**Potentially Restorable Wetlands**" & "**Potential Wetland Preservation Sites**".
3. Once the PRW/PWP layer(s) are displayed, the 3 layer list menus shown below should be included adjacent to the map:

## WETLAND FUNCTIONAL RATINGS

(can *only click one function at a time* and once clicked shows drop-down of 4 color codes with rating categories: Low, Moderate, High, N/A

| | |
|---|---|
| | **Carbon Sequestration** |
| | **Flood Water Storage** |
| | **Native Fish Habitat** |
| | **Nutrient Transformation (P-focus)** |
| | **Other Wetland-Dependent Bird Habitat** |
| | **Sediment & Other Particulate Retention** |
| | **Shoreline/Streambank Stabilization** |
| | **Stream Baseflow Maintenance** |
| | **Stream Shading** |
| | **Unique Wetland Resources** |
| | **Waterfowl Habitat** |
| | **Wildlife Movement Corridors** |
| | **Woodland Amphibian Habitat** |

## INFORMATION LAYERS

| | |
|---|---|
| | **ADvance IDentification Wetlands** |
| | **Extended Surface Water** |
| | **FEMA Floodplains** (4 selected: Flood hazard Zones, BFE, X-Sections & Levees) |
| | **Land Cover 2010** (6 selected make color-codes: Cropland, Early Successional Vegetation, Forest Lands, Grassland, Open Conservation Areas, Pastureland |
| | **Land Use 2010** (11 selected use color-codes same as Maps online: Agricultural, Government/Institutional, Industrial, Office/Research, Public/Private Open Space, Rail, Retail/Commercial, Residential-Single Family, Residential-Multi Family, Transportation, Utility/Waste |
| | **Soils 2004 Hydric** |
| | **Soils 2004 Map Units** |
| | **Soils 2004 Symbols** |
| | **Soils 1970 Map Units** |
| | **Soils 1970 Symbols** |
| | **Transportation** (3 selected: roads, trails, road, labels) |
| | **Tax Parcel Lines** |
| | **Tax Parcel Information** (allows click on any parcel for full info like Maps online) |
| | **Topography 2007 1-Ft Contours** |
| | **USGS Flood of Record** |
| | **WRAPP Field Study Sites** (centroids – click on each hyper-links to Summary Sheet |

## FILTERS

| | |
|---|---|
| | **Wetland/Water Body Size** (once clicked shows drop-down of 3 color codes with size categories for each wetland/water polygon: <1 Acre, 1-5 Acres, >5 Acres |
| | **Proximity to Other Wetlands/Waters** (once clicked shows drop-down of 3 color codes with distance categories for each wetland/water polygon: <100 Ft, 100-500 Ft, >500 Ft |
| | **Proximity to Floodplains** (once clicked shows drop-down of 3 color codes with distance categories for each wetland/water polygon: <100 Ft, 100-500 Ft, >500 Ft |
| | Other?? |
| | Other?? |
| | Other?? |
| | Other?? |
| | Other?? |

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# APPENDIX D

## *W-PAWF FUNCTIONAL OVERVIEW AND STATISTICAL SUMMARY SHEETS*

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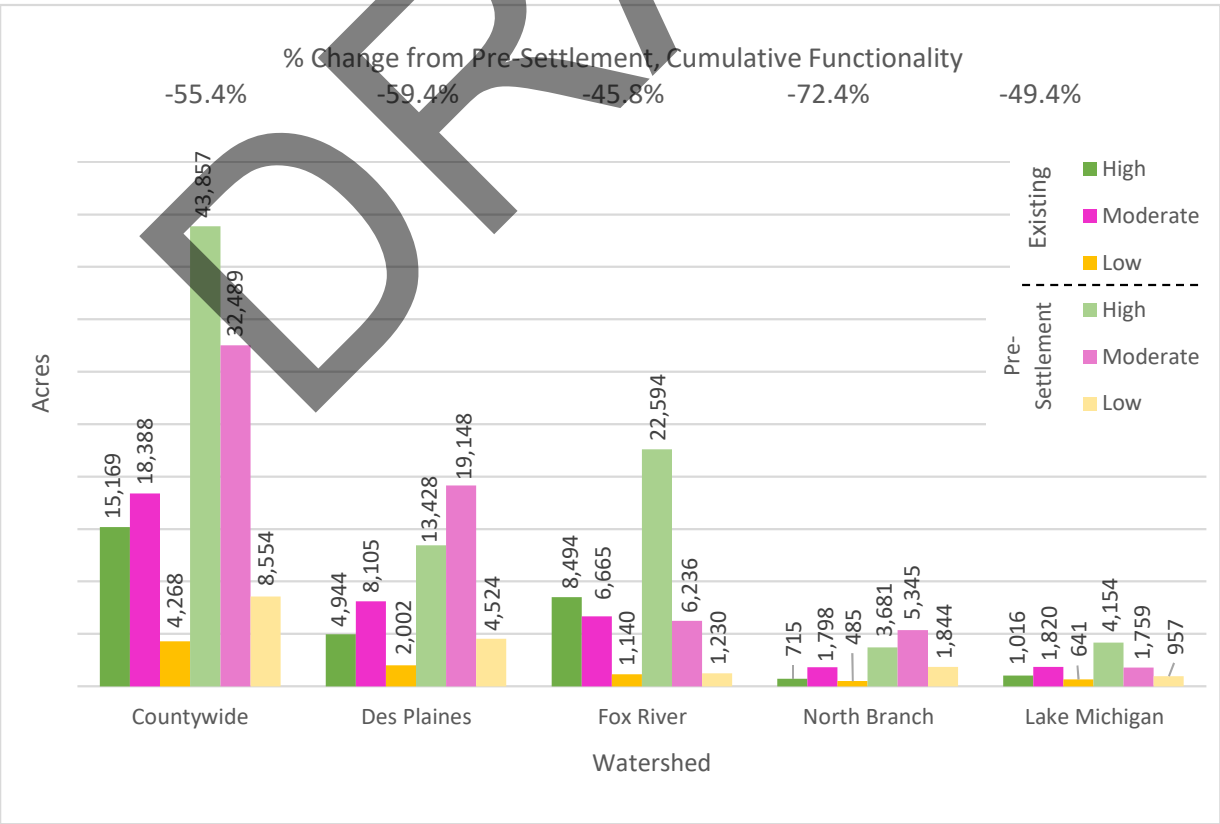
# Carbon Sequestration Function Overview and Statistical Summary

The carbon sequestration function relates to a site's ability to store carbon and help reduce greenhouse gases, slowing climate change. All wetlands store carbon to some degree. However, aquatic beds and wetlands with deep organic soils (so long as they are not ditched, drained, or farmed) provide this function at a particularly high level, as described in the following rating criteria chart.

| | | |
|---|---|---|
| **Carbon Sequestration** | High | • Vegetated wetlands on organic soils that have not been drained/ditched (excluding vernal pools and farmed wetlands)<br>• Palustrine forested, scrub-shrub or mixes of those wetlands on mineral soils that are seasonally flooded, seasonally flooded/saturated, semi-permanently flooded, permanently flooded, or artificially flooded (excluding vernal pools)<br>• Aquatic beds (Lacustrine and Palustrine) and their mixes with other vegetated wetland classes (e.g., emergent, forested, and scrub-shrub) |
| | Moderate | • Vegetated wetlands on ditched/drained organic soils<br>• Other vegetated wetlands on mineral soils that are seasonally flooded, seasonally flooded/saturated, semi-permanently flooded, permanently flooded, or artificially flooded (excluding vernal pools and farmed wetlands)<br>• Palustrine forested, scrub-shrub or mixes of those wetlands on mineral soils that are temporarily flooded, saturated, intermittently exposed, or intermittently flooded |
| | Low | • All remaining wetlands<br>• Ephemeral and intermittent streams |
| | N/A | • All remaining water bodies |

The chart below summarizes wetland acreage for the Carbon Sequestration function by significance levels for existing and historic wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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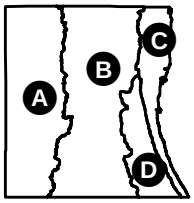
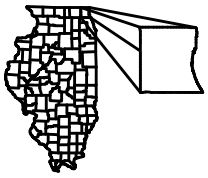
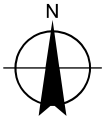
# Carbon Sequestration Wetland Functional Loss (Estimated), Lake County, Illinois.

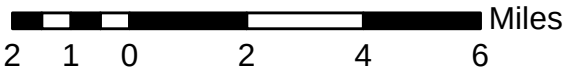
- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River



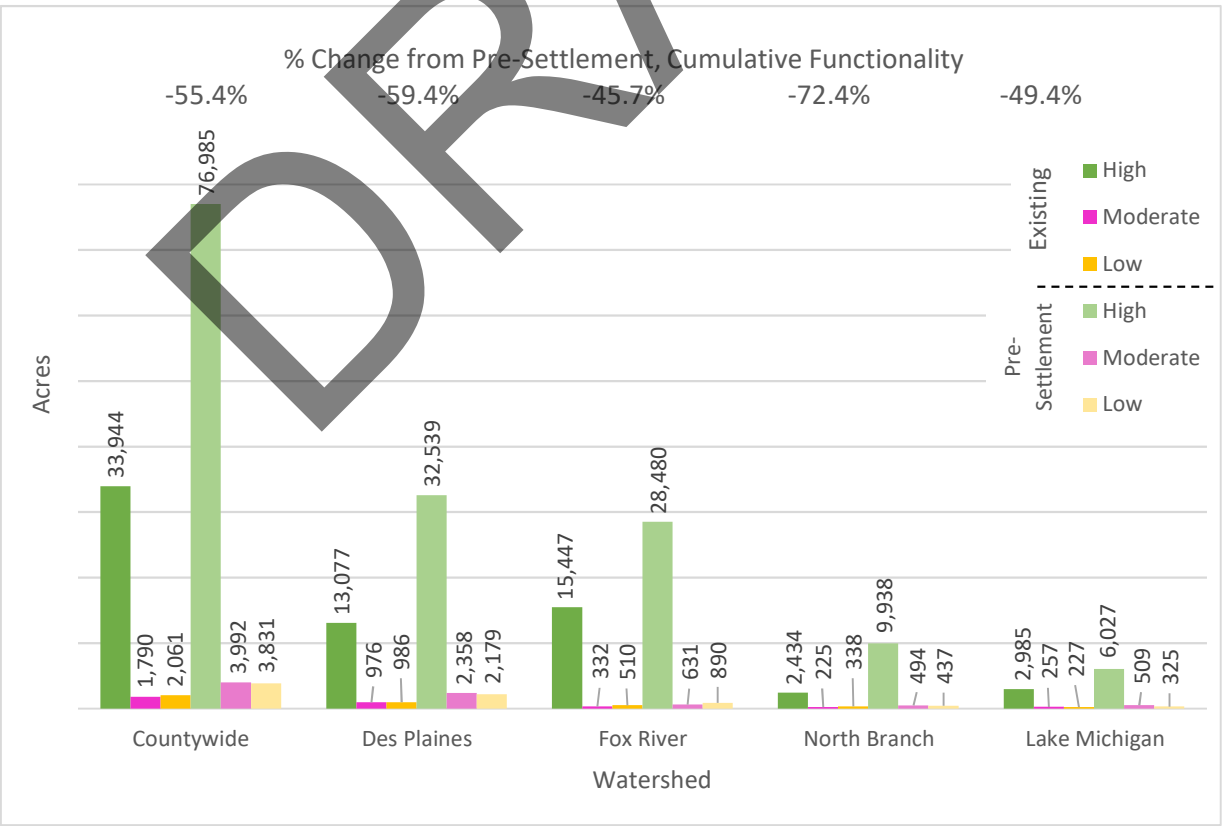



# Flood Water Storage Function Overview and Statistical Summary

The flood water storage function relates to a site's ability to delay downstream flooding and/or lower flood heights (which helps minimize flood-related injury and property damage). Except for slope wetlands located outside of mapped flood hazard areas (e.g., seeps/springs on ravines), most wetlands perform this function to some degree, as described in the following criteria chart.

| | | |
|---|---|---|
| **Flood Water Storage** | High | • Wetlands & water bodies associated with a mapped special flood hazard area, excluding Slope wetlands<br>• Terrene basins with > 0.75 acre-feet of storage<br>• Throughflow & Throughflow-Intermittent ponds and associated basin, fringe, and island wetlands, as well as lakes (> 6 acres) not rated High per previous bullets<br>• Polygons identified as stormwater basins |
| | Moderate | • Wetlands & water bodies that intersect the USGS flood of record not rated High, excluding Slope wetlands<br>• Wetlands & water bodies associated with rivers, streams, and lakes with no mapped FEMA floodplain or outside of the mapped floodplain and not already rated High<br>• Flat wetlands outside of mapped floodplains<br>• All remaining Ponds not already rated High or Moderate<br>• Remaining fringe and island wetlands and remaining Lentic and Lotic wetlands<br>• Remaining Basin wetlands that are isolated or impounded and not slough wetlands |
| | Low | • Remaining wetlands that are not Slope wetlands, including slough wetlands<br>• Slope wetlands within the FEMA 100 or 500 yr floodplains |
| | N/A | • All remaining Slope wetlands |

The chart below summarizes wetland acreage for the Flood Water Storage function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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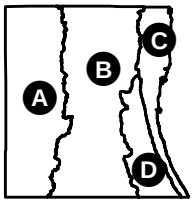
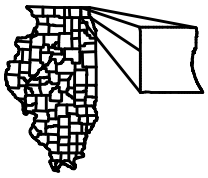
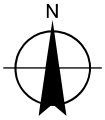
# Flood Water Storage Wetland Functional Loss (Estimated), Lake County, Illinois.

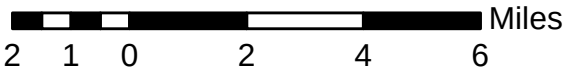
- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River



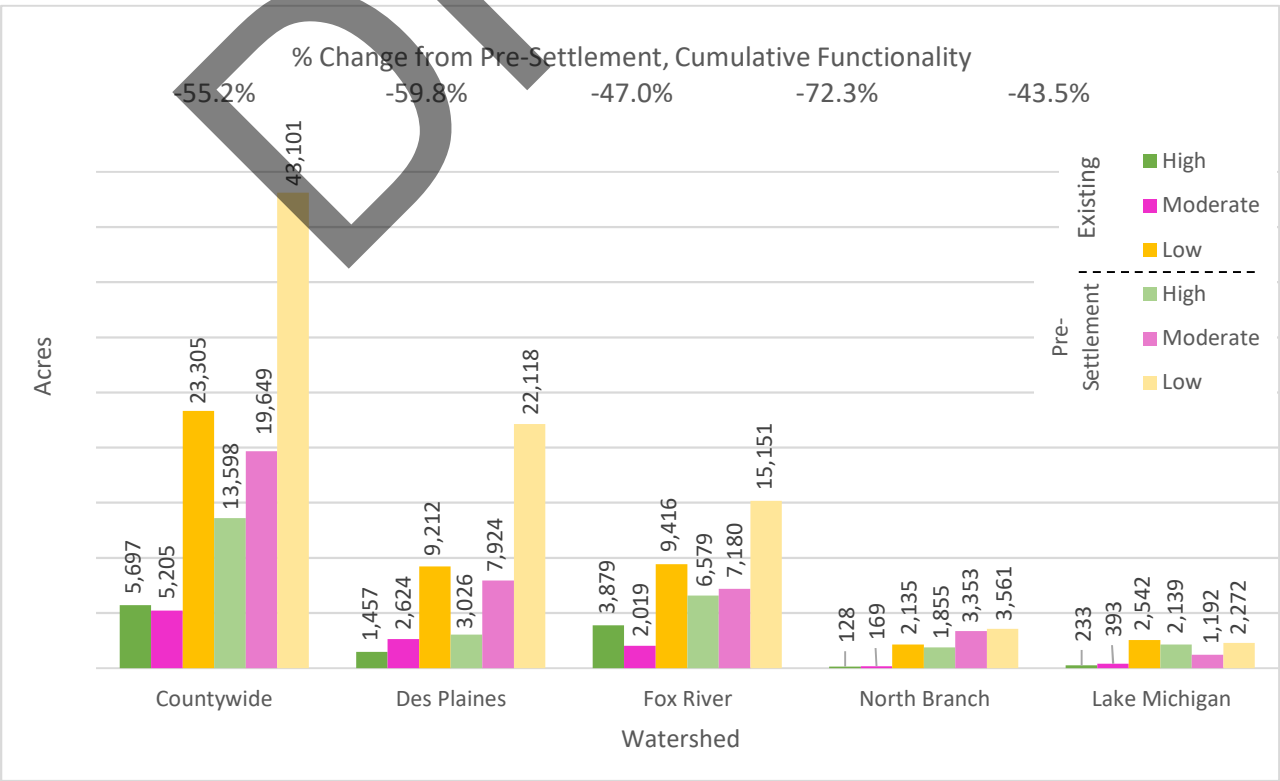



# Native Fish Habitat Function Overview and Statistical Summary

The WRAPP Technical Advisory Group developed the rating criteria for this function to focus on native fish habitat in Lake County. Wetlands and water bodies that provide this function are predicted to have spawning, nursery, foraging, refuge and/or cover habitat for some portion or all the native fishes' life cycle during most or all years. The rating criteria chart below differentiates various wetlands and water bodies according to their functional significance for native fish habitat.

| | | |
|---|---|---|
| **Native Fish Habitat** | High | • Rivers and natural lakes, including those modified with spillways, dams or channels<br>• Perennial, non-channelized streams with barrier-free connection to a river or natural lake<br>• Wetlands contiguous to water bodies in above bullets AND flooded semi-permanently or longer<br>• Wetlands and water bodies with recent documented occurrence of Illinois or Federal T/E fish species (e.g., within past 10 years of INAI June 2016 geographic information layer)<br>• Headwater wetlands, except artificial outflow types<br>• Natural ponds and wetlands flooded or inundated semi-permanently or longer (includes fringe ponds and pond islands) within polygons that satisfy above bullets |
| | Moderate | • Artificial Lakes created by impoundment or excavation<br>• Perennial unchannelized streams upstream of 1st dam above mouth at river, glacial lake, or Lake Michigan<br>• Perennial channelized streams with natural or permanent, barrier-free connection to river, natural lake, or Lake Michigan<br>• Intermittent unchannelized, undammed streams with barrier-free connection to a natural lake or river<br>• Wetlands contiguous to water bodies defined under above bullets AND flooded or inundated semi-permanently or longer<br>• Remaining ponds contiguous to polygons rated High or identified in above bullets, including excavated/impounded online ponds that are semi-permanently flooded o wetter<br>• All remaining permanently flooded natural ponds (e.g., isolated ponds)<br>• Fringe and Island wetlands flooded or inundated semi-permanently or longer AND contiguous to ponds rated Moderate<br>• Artificial outflow type (e.g., ditched) headwater wetlands<br>• Wetlands flooded seasonally or longer AND contiguous to polygons rated High, excluding those connected by ditches<br>• All remaining Lotic River Floodplain Basin Wetlands |
| | Low | • All remaining water bodies (lakes, rivers, streams, ponds), excluding dry detention basins coded as ponds and artificially flooded ponds<br>• All remaining wetlands contiguous to water bodies, excluding ephemeral streams and dry detention basins<br>• All remaining wetlands flooded temporarily AND contiguous to polygons rated High<br>• Basin wetlands flooded seasonally or longer<br>• All remaining floodplain wetlands flooded seasonally or longer AND not farmed<br>• All remaining outflow and throughflow wetlands flooded seasonally or longer AND contiguous to polygons rated High or Moderate, excluding farmed wetlands |
| | N/A | • All remaining wetlands and water bodies |

The chart below summarizes wetland acreage for the Native Fish Habitat function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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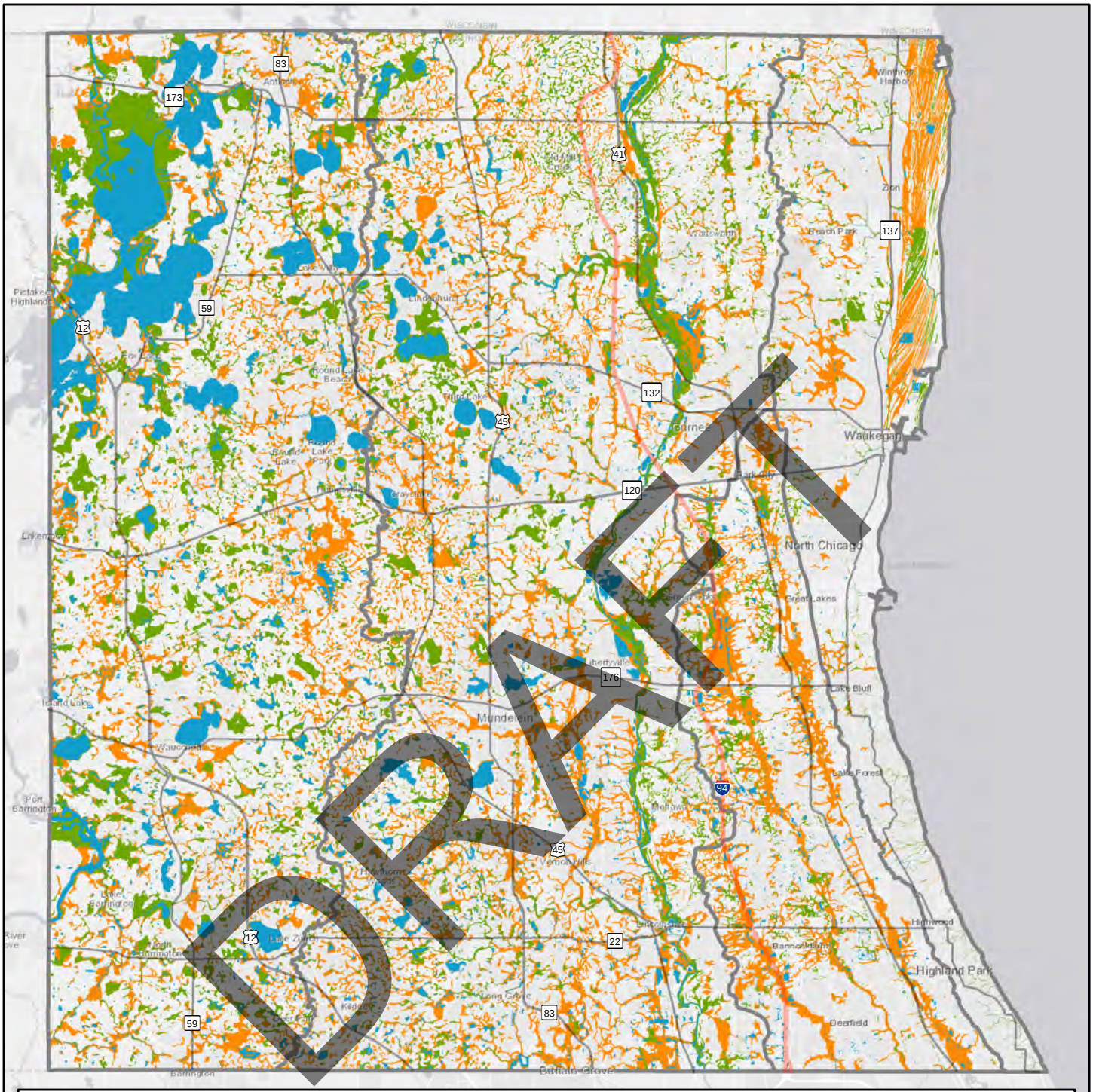
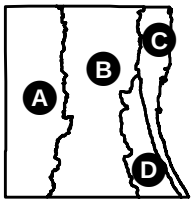
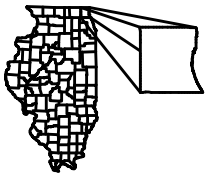



# Native Fish Habitat Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

N

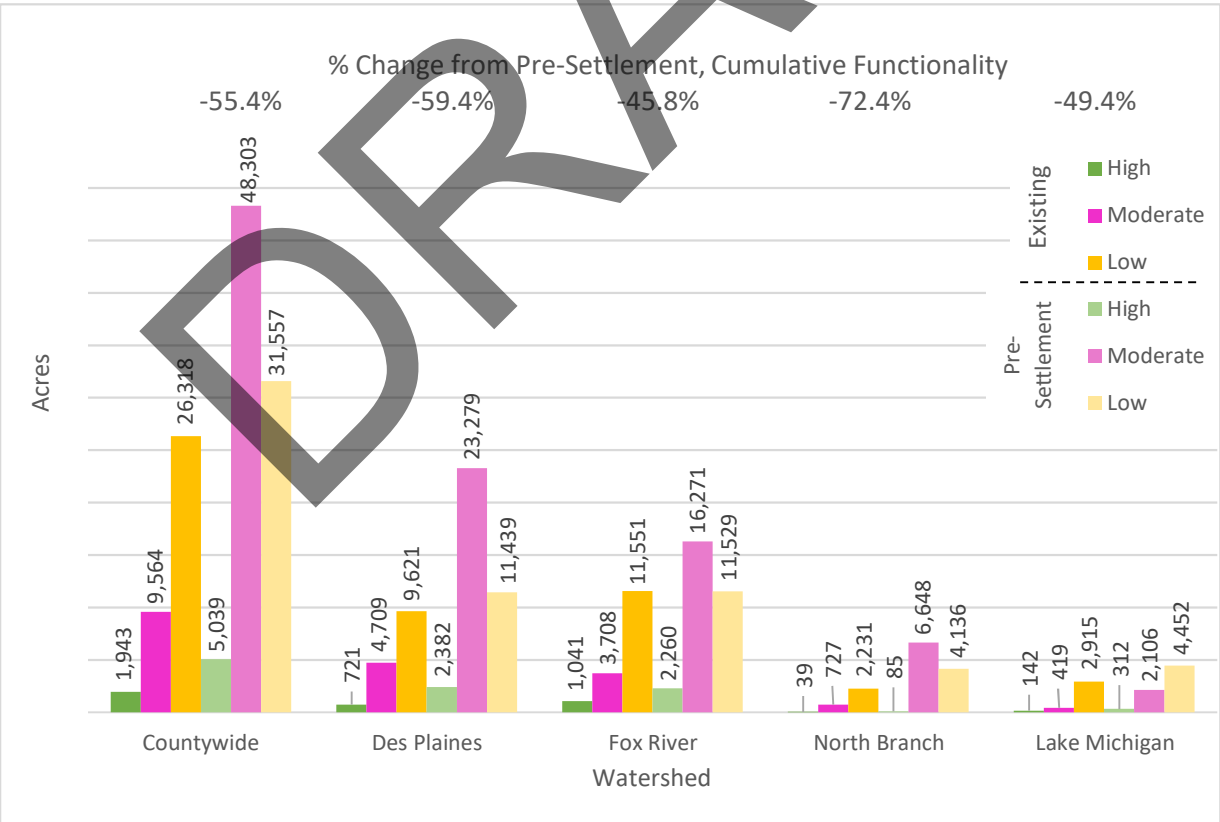
2 1 0 2 4 6 Miles

# Nutrient Transformation (P focus) Function Overview and Statistical Summary

Nutrient transformation relates to a wetland or water body's ability to remove nutrients from the water column and improve local water quality. The WRAPP Technical Advisory Group refined the criteria for this function to focus on retention of phosphorus (P), as that is the limiting nutrient for many water quality concerns within Lake County. All wetlands perform this function to some degree, and size is not a factor in the ability to perform the function. The rating criteria chart below differentiates various wetlands and water bodies according to their functional significance for nutrient transformation (P-focus).

| | | |
|---|---|---|
| **Nutrient Transformation (P-focus)** | High | • Isolated wetlands (excluding vernal pools and farmed wetlands) |
| | Moderate | • Throughflow and outflow-type riparian wetlands that are seasonally saturated or seasonally flooded (excluding ditched wetlands and farmed wetlands)<br>• Isolated farmed wetlands that are Terrene Basin or Terrene Flat |
| | Low | • All remaining wetlands (e.g., slope wetlands, vernal pools, remaining ditched wetlands) and water bodies (e.g., open water portions of lakes, ponds, and rivers and intermittent streams) |
| | N/A | -- |

The chart below summarizes wetland acreage for the Nutrient Transformation (P focus) function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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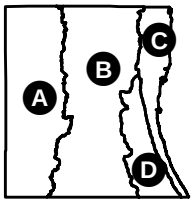
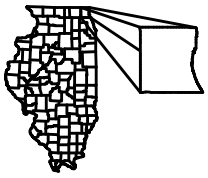
# Nutrient Transformation (P-Focus) Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

N

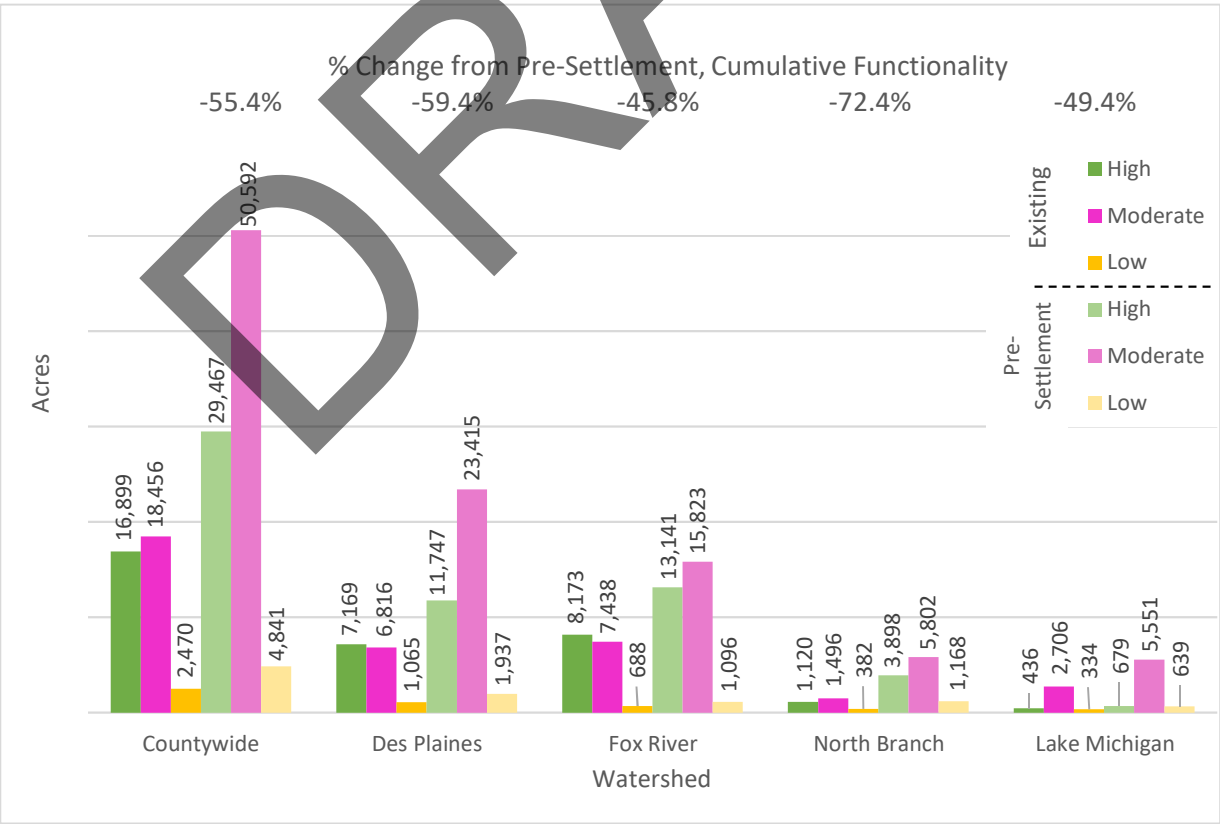
2 1 0 2 4 6 Miles

# Sediment and Other Particulate Function Overview and Statistical Summary

The sediment and other particulate retention function relates to a wetland or water body's ability to retain sediment that would otherwise move downstream and build up in rivers, streams, lakes, or ponds. This function supports improved water quality by capturing sediment particles and any nutrients or heavy metals bonded to them. All wetlands and water bodies perform this function to some degree, as described in the following rating criteria chart.

| | | |
|---|---|---|
| **Sediment and Other Particulate Retention** | High | • Basin, Fringe, and Island wetlands associated with lakes (excluding unconsolidated shore types)<br>• Floodplain wetlands (excluding unconsolidated shore types)<br>• Terrene Basin Isolated wetlands<br>Lacustrine Limnetic systems (depth > 2m) |
| | Moderate | • Island wetlands (other than those associated with lakes)<br>• Throughflow or Throughflow-Intermittent Lotic Stream Basin, Flat, and Fringe wetlands<br>• Lotic River Basin, Flat and Fringe Throughflow wetlands<br>• Throughflow or Throughflow-Intermittent Ponds<br>• Throughflow-Intermittent, Outflow, Outflow-Intermittent, or Outflow Artificial Terrene Basin wetlands<br>• Lacustrine Littoral systems (excluding unconsolidated shore types)<br>• All wetlands associated with a pond |
| | Low | • All remaining wetlands and water bodies |
| | N/A | -- |

The chart below summarizes wetland acreage for the Sediment and Other Particulate function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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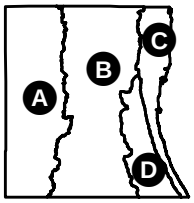
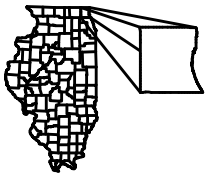
# Sediment/Other Particulate Retention Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



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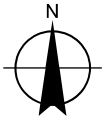
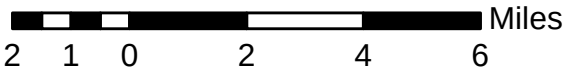


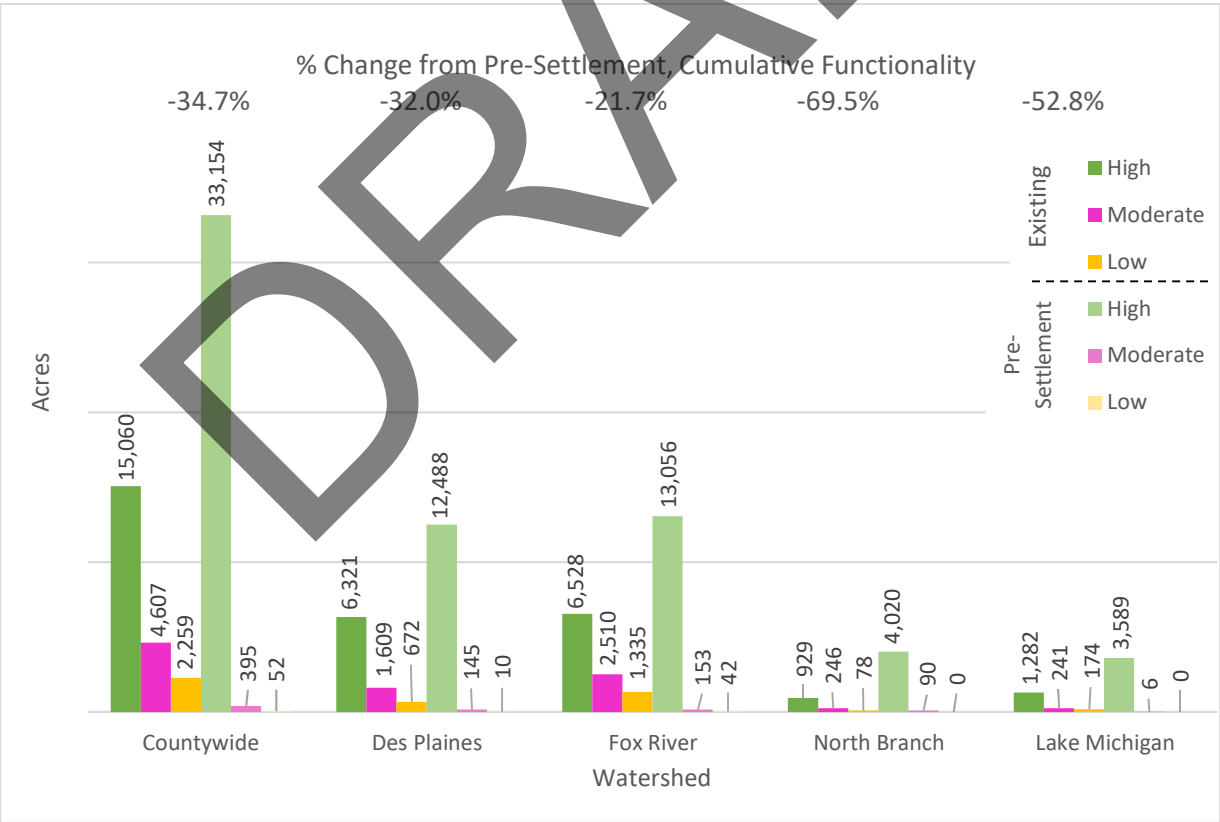



# Shoreline and Stream Bank Stabilization Function Overview and Statistical Summary

The Shoreline and Stream Bank Stabilization function focuses on erosion from wave action and cutting by stream currents. Vegetation and width of the flanking wetland are primary characteristics for a High rating, as is the size of a water body. If a wetland is not associated with flowing water or open water areas, this function does not apply. The following rating criteria chart differentiates various wetlands and water bodies according to their functional significance for shoreline and streambank stabilization.

| | | |
|---|---|---|
| **Shoreline/ Stream Bank Stabilization** | High | • Vegetated wetlands along water bodies (excluding ponds and island wetlands) where:<br>○ ≥ 20 ft width of vegetated palustrine wetland adjacent to open water in lake<br>○ ≥ 10 ft feet of vegetated palustrine wetland along open water of stream or river |
| | Moderate | • Vegetated wetlands along water bodies (excluding island wetlands) where:<br>○ ≥ 10 ft width (but <20 ft) of vegetated palustrine wetland adjacent to open water in lake<br>○ < 10 ft of vegetated palustrine wetland along open water of stream or river<br>• Vegetated wetlands along ponds (excluding island, farmed, and turfgrass wetlands)<br>• Headwater-position wetlands that are Terrene Outflow, Outflow Intermittent, and Outflow Artificial |
| | Low | • Island wetlands<br>• Remaining wetlands along water bodies<br>• Ephemeral and intermittent streams |
| | N/A | • All remaining wetlands and water bodies |

The chart below summarizes wetland acreage for the Shoreline and Stream Bank Stabilization function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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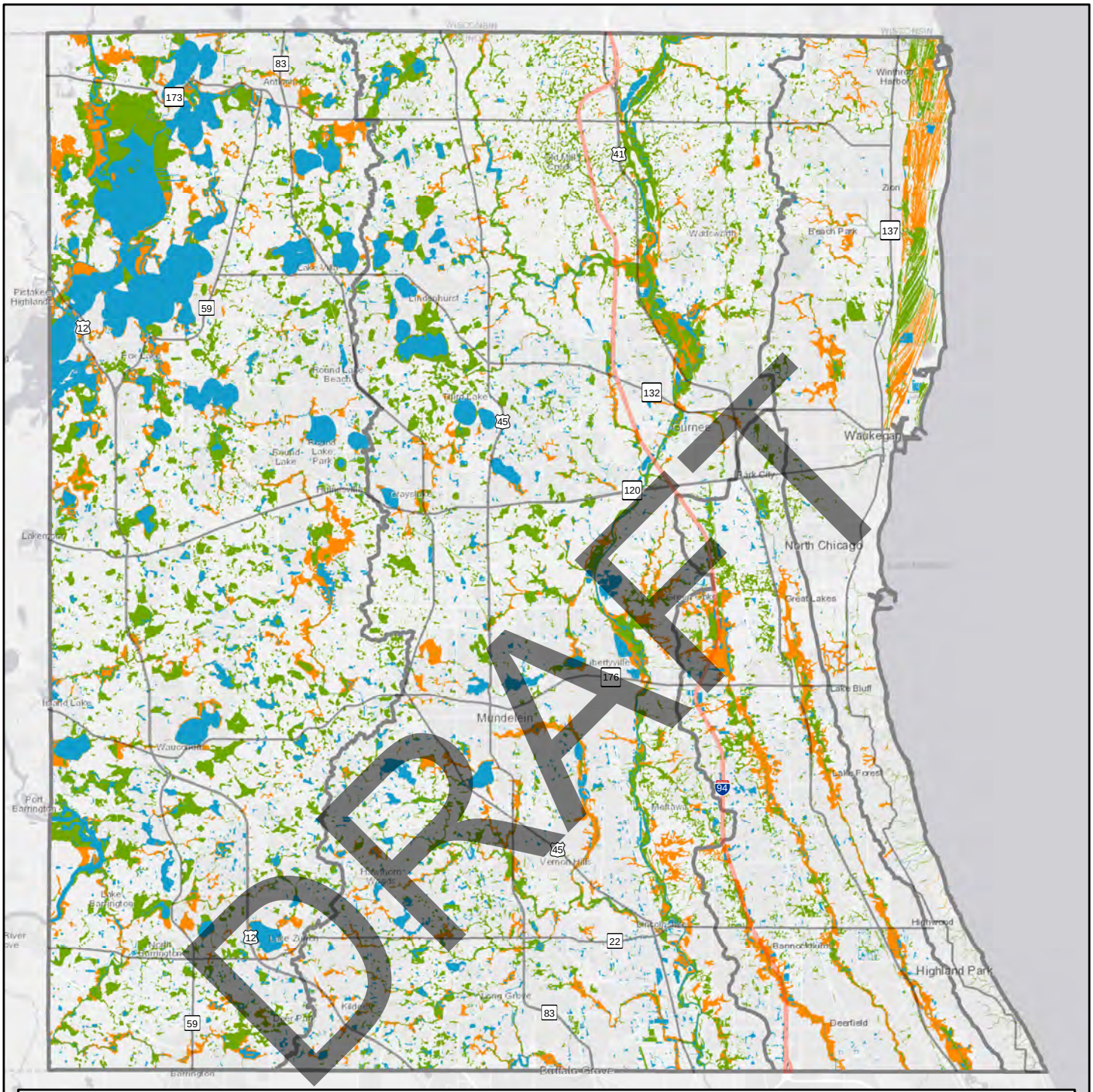
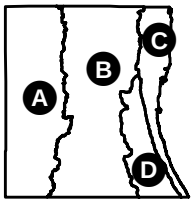
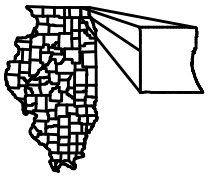



## Shoreline/Stream Bank Stabilization Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

N

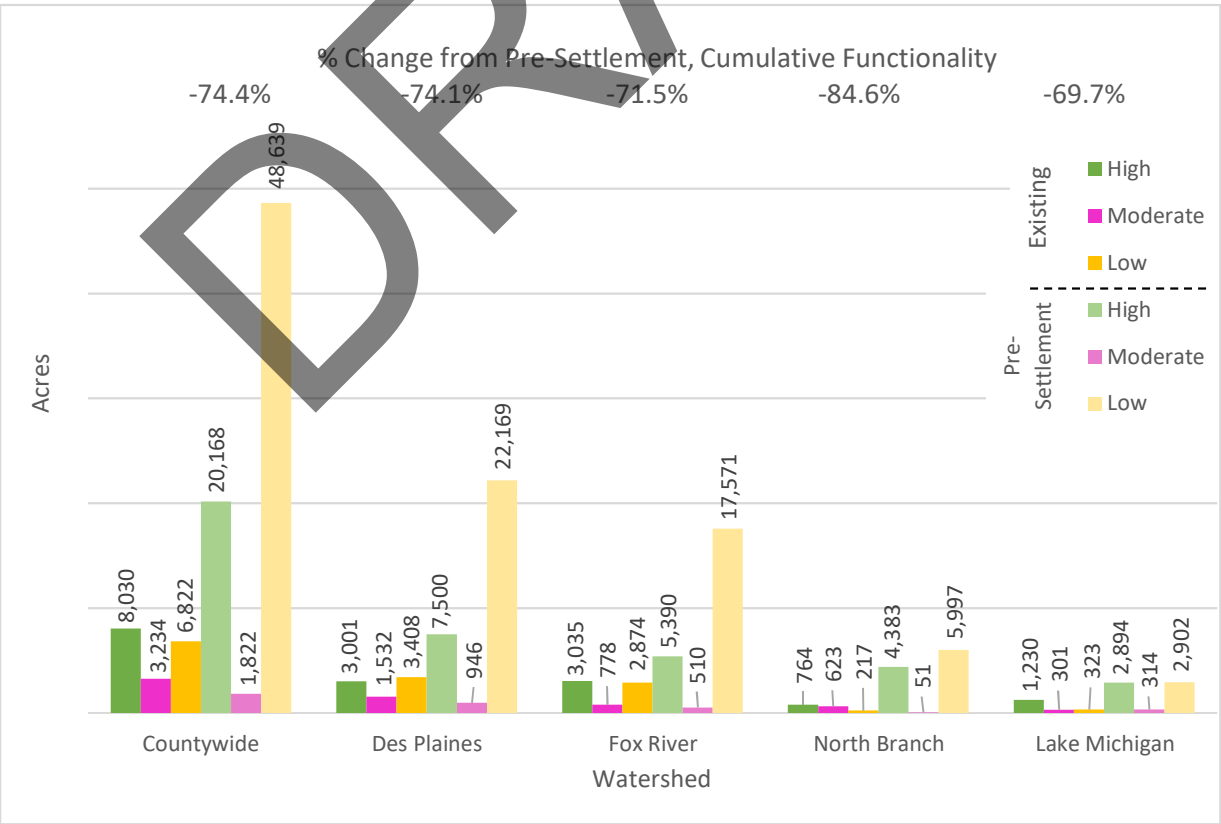
2 1 0 2 4 6 Miles

# Stream Baseflow Maintenance Function Overview and Statistical Summary

The stream baseflow maintenance function relates to the ability of a wetland or water body to source water that sustains base flow levels in streams. This function is especially critical during dry periods and is an important aspect in supporting aquatic life. The rating criteria chart below differentiates various wetlands and water bodies according to their significance for this function.

| | | |
|---|---|---|
| **Stream Baseflow Maintenance** | High | • Headwater wetlands, excluding ditched/drained<br>• Slope wetlands within 50 feet of rivers/streams or Lotic wetlands<br>• Lotic stream wetlands flooded seasonally or for longer durations<br>• Throughflow & Outflow lakes with permanent hydrologic connection to perennial stream (excluding Great Lakes coastal types, e.g., Lake Michigan) |
| | Moderate | • Ditched/drained headwater wetlands<br>• Drier Lotic stream wetlands<br>• Throughflow & Outflow ponds with permanent hydrologic connection to perennial stream<br>• Slope wetlands within 100 feet of rivers/streams or lotic wetlands and not rated High |
| | Low | • Lotic River wetlands<br>• Outflow & Throughflow lakes, ponds, and wetlands (excluding headwater wetlands) connected naturally or via stormsewer piping to a stream system, including intermittent types<br>• Remaining wetlands contiguous to streams |
| | N/A | • Rivers, streams, and remaining water bodies and wetlands, including all isolated wetlands |

The chart below summarizes wetland acreage for the Stream Baseflow Maintenance function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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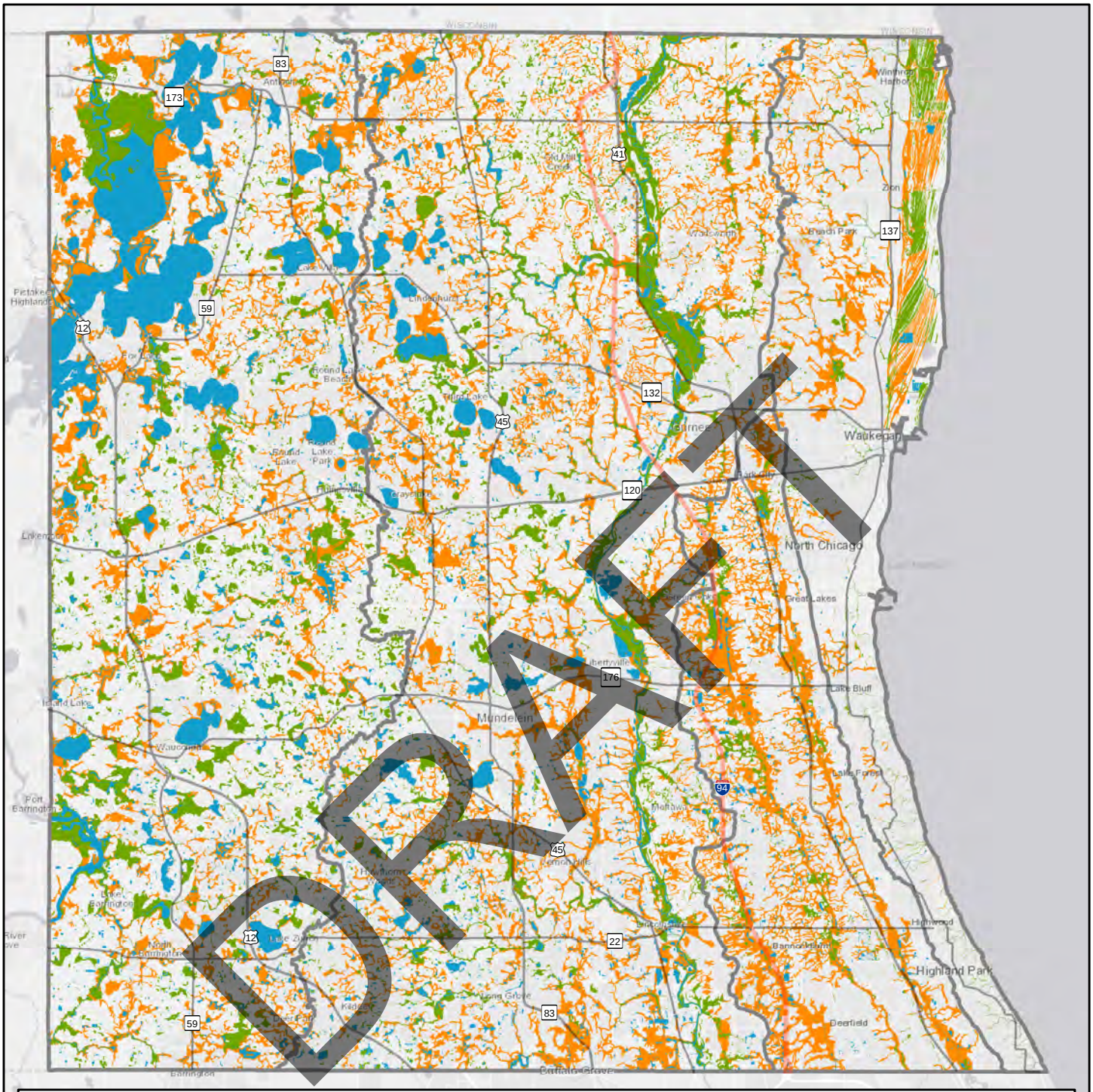
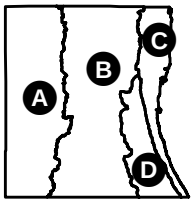
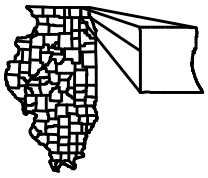


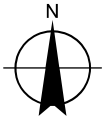

## Stream Baseflow Maintenance Wetland Functional Loss (Estimated), Lake County, Illinois.

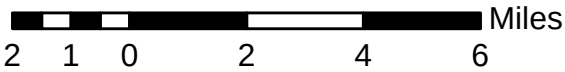
- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River



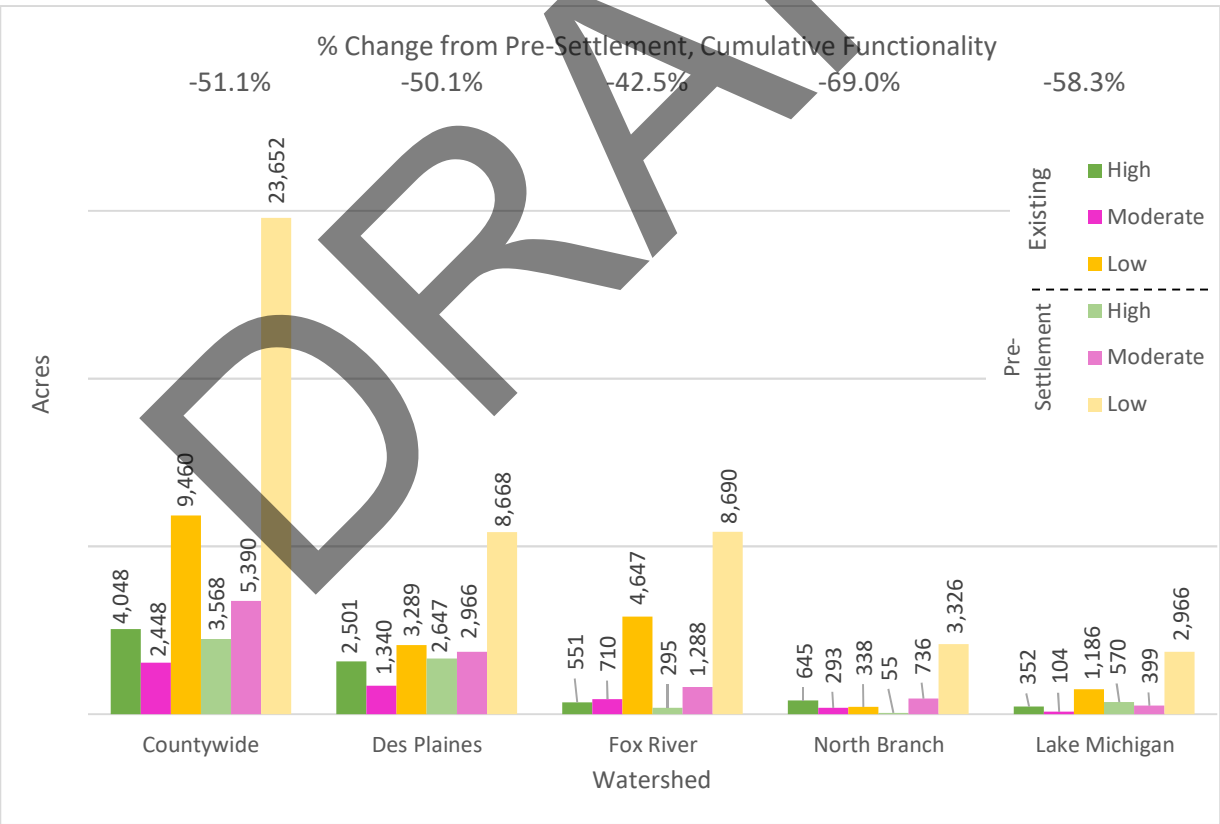



# Stream Shading Function Overview and Statistical Summary

High vegetation along streams and rivers can provide shading, which helps regulate the water temperature. Cooler water temperatures decrease the solubility of many chemicals, which in turn reduces the toxic stress on aquatic organisms. Temperature regulation also increases the significance of the fish and amphibian habitat wetland functions. The following rating criteria chart differentiates various wetlands and water bodies according to their functional significance for stream shading.

| | | |
|---|---|---|
| **Stream Shading** | High | • Forested or scrub-shrub headwater wetlands<br>• Forested wetlands within 50 feet of streams and rivers |
| | Moderate | • Scrub-shrub wetlands or Forested mixes not previously rated High AND within 50 feet of streams and rivers |
| | Low | • Emergent (persistent vegetation) or Emergent/Scrub-shrub wetlands within 50 feet of streams and rivers |
| | N/A | • All remaining wetlands and water bodies |

The chart below summarizes wetland acreage for the Stream Shading function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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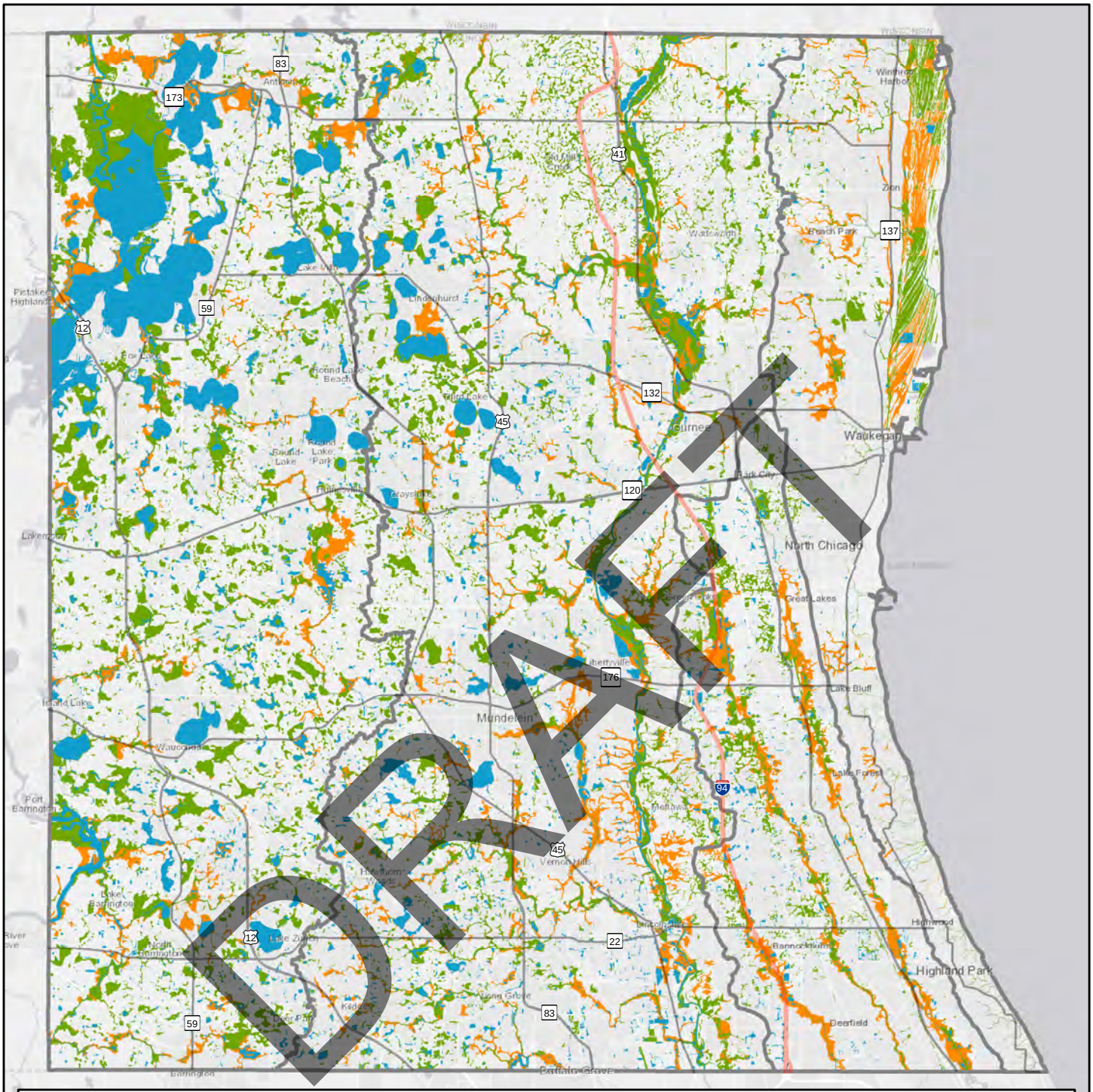
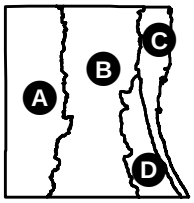
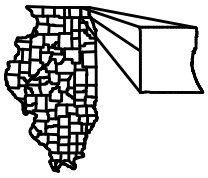


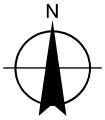

## Stream Shading Wetland Functional Loss (Estimated), Lake County, Illinois.

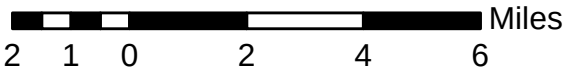
- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River



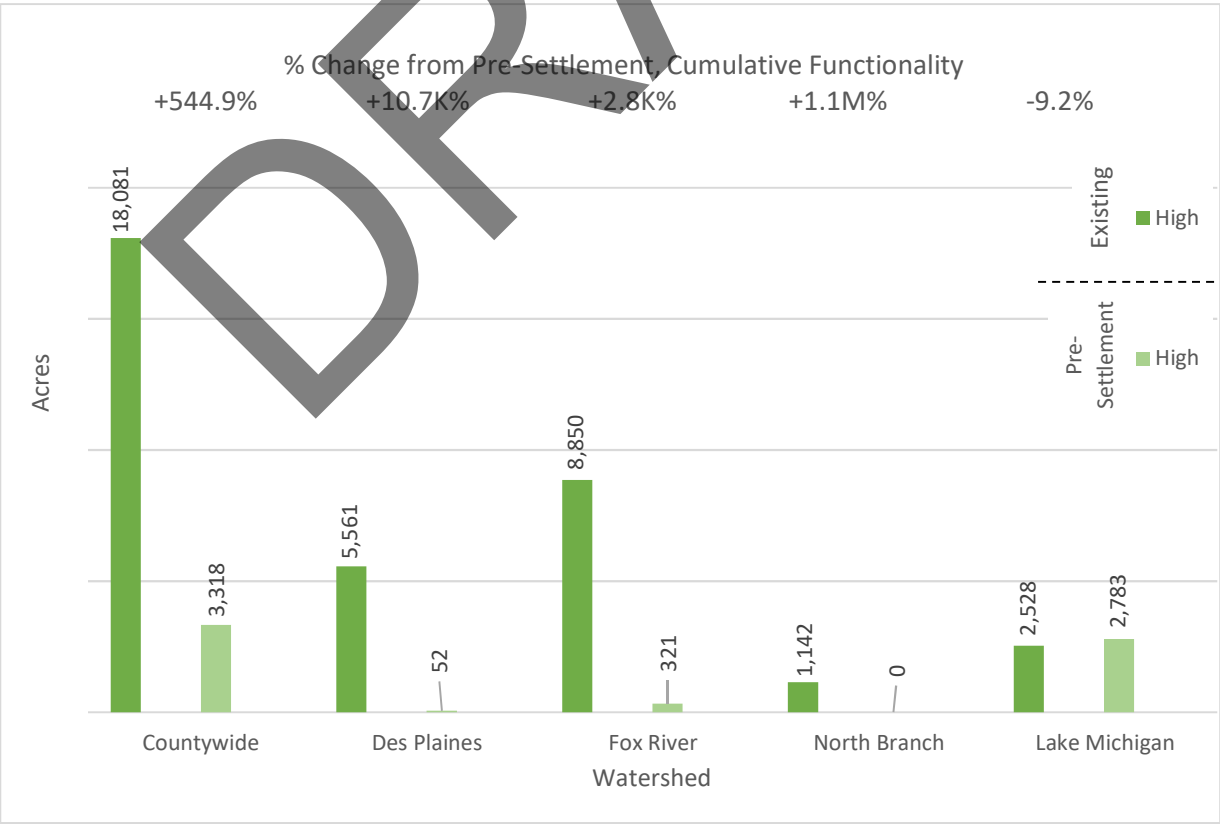



# Unique Wetland Resources Function Overview and Statistical Summary

The wetlands and water bodies in this category are unique on a global, state or local level. For the WRAPP, Unique Wetland Resources perform biological and/or stormwater management functions at an exceptional level. Many of these wetlands contain a wide variety of fauna and flora, including threatened or endangered species. Examples include bogs, ephemeral (vernal) pools, hillside seeps associated with ravine features, Ramsar-designated wetlands of international importance (e.g., Chiwaukee Prairie), Lake Michigan coastal wetlands, U.S. Environmental Protection Agency-designated Advanced Identification (ADID) sites, and designated Illinois Natural Area Inventory (INAI) sites. Per the chart below, this function does not apply unless a wetland or water body meets one or more of the criteria to rank as High.

| | | |
|---|---|---|
| **Unique Wetland Resources** | High | • Wetlands of international importance (Ramsar designation – e.g., Chiwaukee Prairie)<br>• Wetlands/water bodies with significant biological and/or stormwater management functions per ADID study (Dreher et al. 1992), excluding detention basins<br>• Wetlands in designated Illinois Natural Area Inventory Sites<br>• Bogs<br>• Ephemeral (vernal) pools<br>• Hillside seeps associated with ravine features (slope wetlands)<br>• Lake Michigan coastal wetlands, including dune-swale complex and beach habitat<br>• Constructed wetland mitigation bank sites (permitted by Army Corps or SMC) |
| | Moderate | -- |
| | Low | -- |
| | N/A | • All wetlands and water bodies not rated High |

The chart below summarizes wetland acreage for the Unique Wetland Resources function by significance levels for existing and pre-settlement wetlands. Percent change reflects only High functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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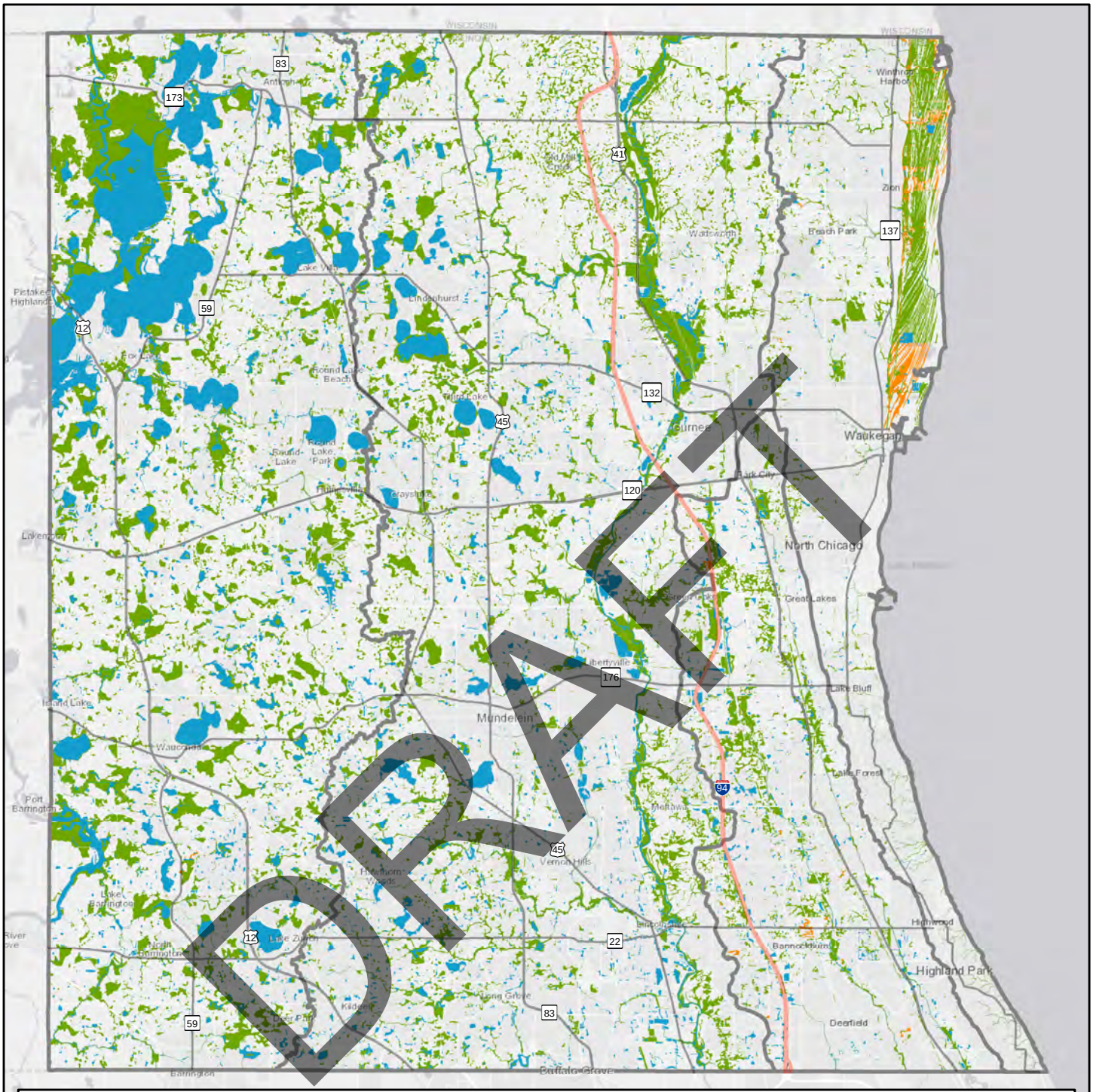
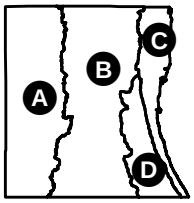
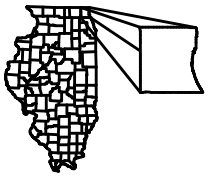



# Unique Wetland Resources Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

N

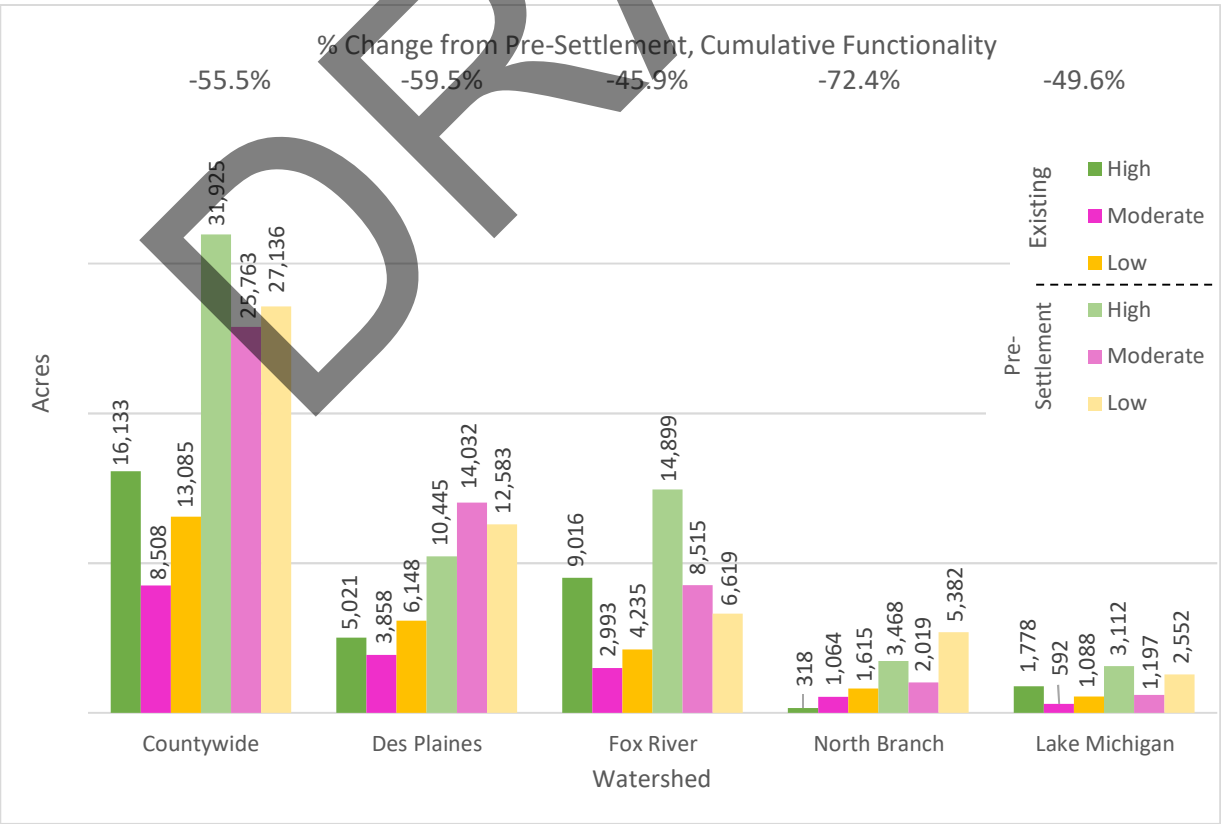
2 1 0 2 4 6 Miles

# Waterfowl Habitat Function Overview and Statistical Summary

The WRAPP Technical Advisory Group developed the rating criteria for this function specifically for waterfowl (e.g., ducks, geese, swans). Wetlands designated as particularly important for waterfowl are generally those used for nesting, feeding or reproduction. Open water zones of natural lakes and ponds and larger streams and rivers also rate High for providing landing/rafting areas and habitat for diving species, as described in the rating criteria chart below.

| | | |
|---|---|---|
| **Waterfowl Habitat** | High | • Aquatic beds, excluding detention basins<br>• Emergent wetlands flooded semi-permanently, permanently flooded, or intermittently exposed (excluding farmed wetlands)<br>• Emergent wetlands seasonally flooded AND contiguous to a water body (excluding farmed wetlands)<br>• Island wetlands with emergent vegetation<br>• Natural lakes and ponds (open water zone)<br>• Rivers (open water zone) |
| | Moderate | • Forested and scrub-shrub wetlands seasonally, semi-permanently, intermittently or permanently flooded, or intermittently exposed (excluding terrene flat areas outside the floodplain and farmed wetlands)<br>• Emergent wetlands seasonally flooded, continuously saturated, seasonally flooded/ saturated, or intermittently flooded (excluding farmed wetlands)<br>• Artificial lakes and ponds<br>• Perennial and Intermittent streams (open water zone)<br>• Temporarily flooded emergent wetlands within the FEMA 100-yr floodplain |
| | Low | • All remaining wetlands except Slope wetlands<br>• Ephemeral streams |
| | N/A | • Slope wetlands not already rated High or Moderate |

The chart below summarizes wetland acreage for the Waterfowl Habitat function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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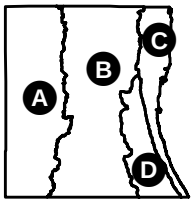
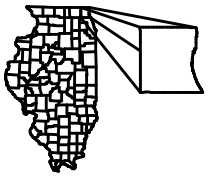
# Waterfowl Habitat Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

N

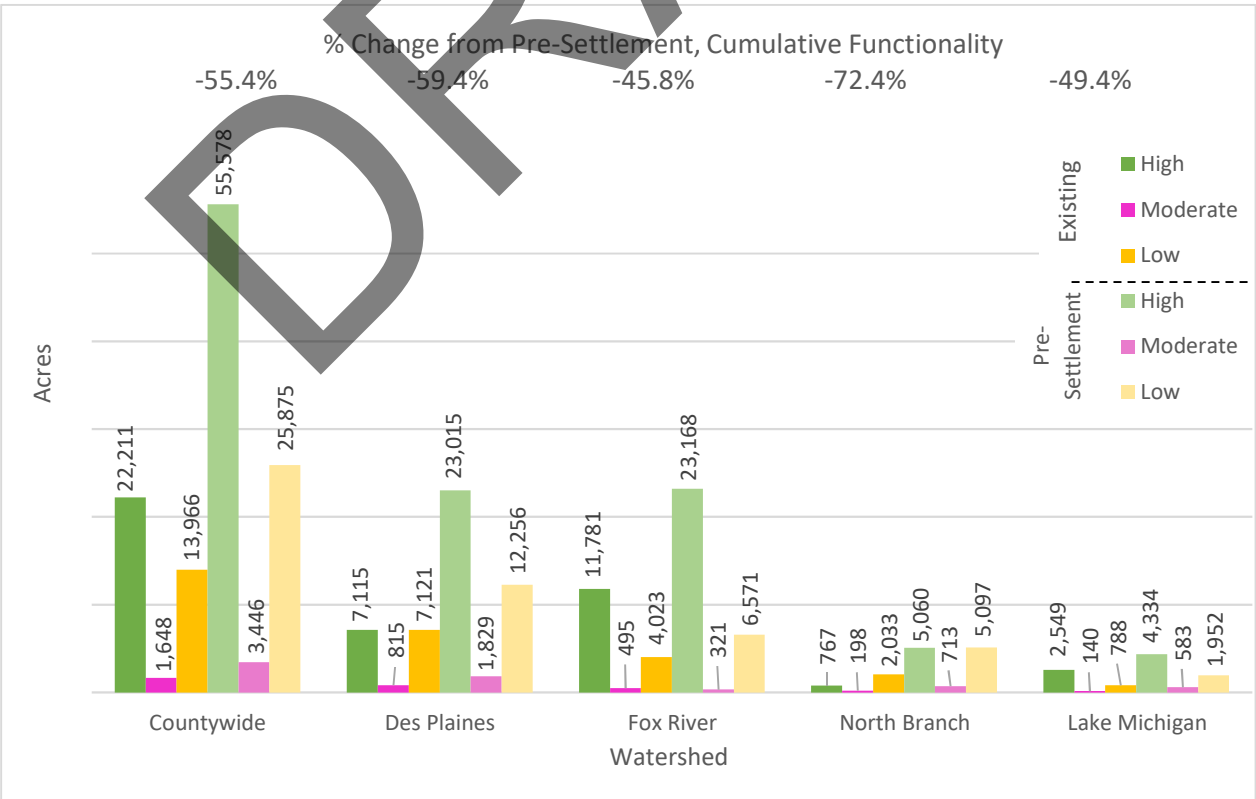
2 1 0 2 4 6 Miles

# Wetland-dependent Bird Habitat (Other) Function Overview and Statistical Summary

This function captures the wetland types and water bodies that provide desired habitat for a variety of wading birds, shorebirds and songbirds (e.g., herons, bitterns, plovers, sandpipers, red-winged and yellow-headed blackbirds). Aquatic beds, island wetlands, and emergent and scrub-shrub wetlands that are seasonally to semi-permanently flooded or are intermittently exposed provide this function at a high level for a wide diversity of bird species that nest, feed and reproduce in these wetland types. Natural ponds that are intermittently exposed and unconsolidated shorelines along natural lakes, ponds and streams/rivers likewise provide this function at a high level for many shorebirds. The rating criteria chart below differentiates various wetlands and water bodies according to their functional significance for providing Wetland-dependent Bird Habitat (Other).

| | | |
|---|---|---|
| **Wetland-dependent Bird Habitat (Other)** | High | • Seasonally, intermittently or semi-permanently flooded, or intermittently exposed/ flooded or continuously saturated emergent and scrub-shrub wetlands (excluding farmed wetlands)<br>• Island wetlands<br>• Intermittently exposed natural ponds<br>• Unconsolidated shorelines of natural lakes, ponds or streams/rivers<br>• Lake Michigan coastal wetlands, including dune-swale complex |
| | Moderate | • Temporarily flooded emergent and scrub-shrub wetlands (excluding farmed wetlands)<br>• Intermittently exposed artificial ponds<br>• Unconsolidated shorelines associated with artificial lakes and ponds and channelized streams |
| | Low | • All remaining wetlands<br>• All polygons classified as "ponds" that did not rate High or Moderate (e.g., detention basins and bermed impoundments)<br>• Ephemeral and intermittent streams<br>• All remaining aquatic beds |
| | N/A | • Open water zone of lakes, ponds, rivers, and perennial streams; and open water wetlands (aquatic bed and unconsolidated bottom types) not rated High, Moderate, or Low |

The chart below summarizes wetland acreage for the Wetland-dependent Bird Habitat (Other) function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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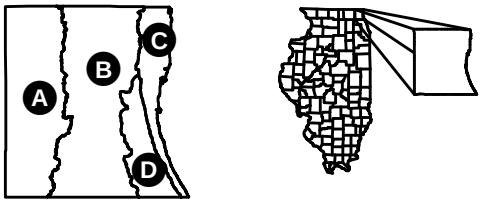
# Wetland-Dependent Bird Habitat Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)




N

2 1 0 2 4 6 Miles

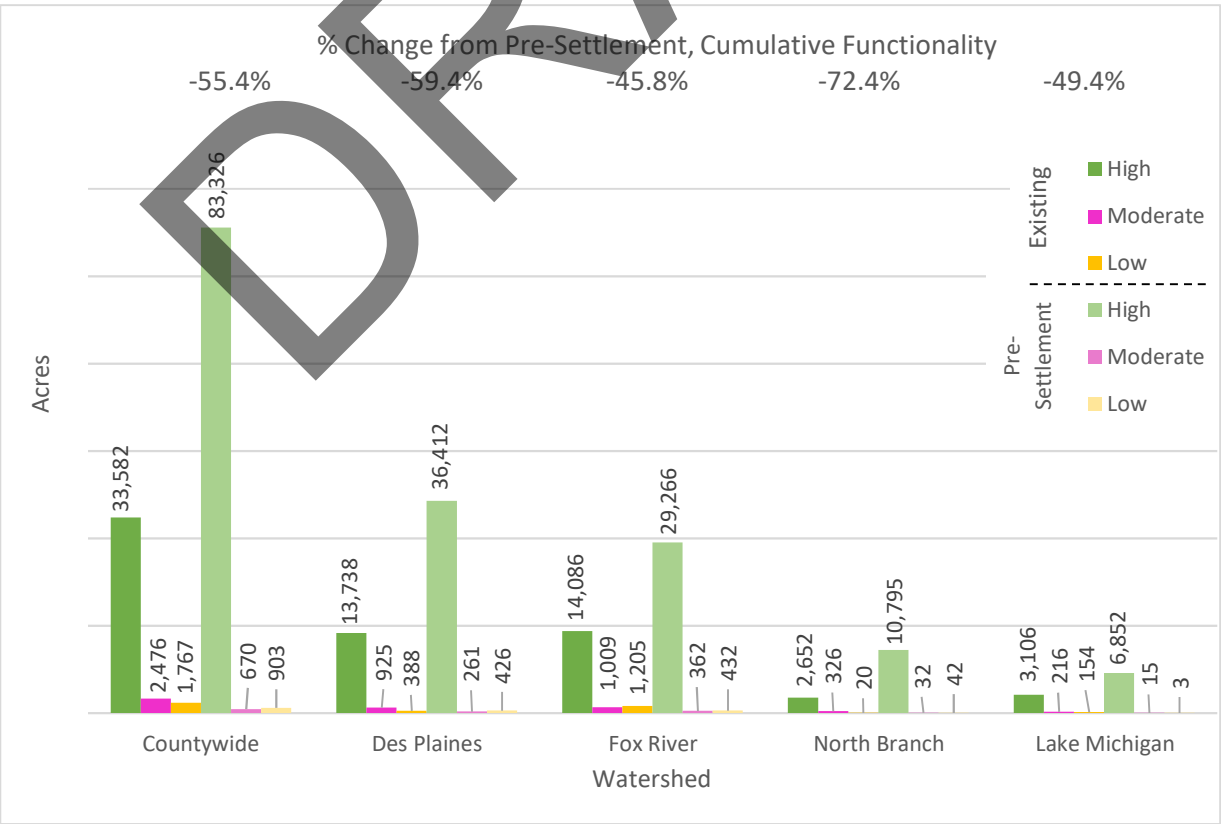
Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

# Wildlife Movement Corridors Function Overview and Statistical Summary

The Wildlife Movement Corridors function emphasizes connectivity that enables movement of mammals, birds, and insects between wetland environments, so accessibility and proximity are key. Vegetated corridors increase a wetland's ability to provide habitat because a larger pool of species can access and use the wetland. Such corridors include upland connections capable of providing refuge, food, and migration for a variety of species, as well as artificial connections such as excavated ditches. The following rating criteria chart differentiates various wetlands and water bodies according to their functional significance for wildlife movement corridors.

| | | |
|---|---|---|
| **Wildlife Movement Corridors** | High | • Vegetated wetlands (except aquatic bed) connected to other wetlands via a broad, relatively unbroken vegetated corridor<br>• Vegetated wetlands (except aquatic bed) connected to large, naturalized upland area via a broad, relatively unbroken vegetated corridor |
| | Moderate | • Aquatic beds connected to other wetlands via a broad, relatively unbroken vegetated corridor<br>• Vegetated wetlands connected to other wetlands or large, naturalized uplands via a narrower and/or interrupted vegetated corridor AND not rated High<br>• Vegetated wetlands and aquatic beds connected to other vegetated wetlands or aquatic beds by a non-vegetated wetland or water body<br>• Vegetated wetlands and aquatic beds lacking connections but located near other aquatic resources or sizeable naturalized upland<br>• Intermittent and ephemeral streams |
| | Low | • All Island wetlands<br>• All remaining wetlands and waters, including Lakes, Rivers, and remaining streams |
| | N/A | -- |

The chart below summarizes wetland acreage for the Wildlife Movement Corridors function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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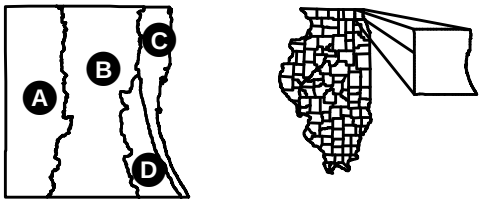
## Wildlife Movement Corridor Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)




N

2 1 0 2 4 6 Miles

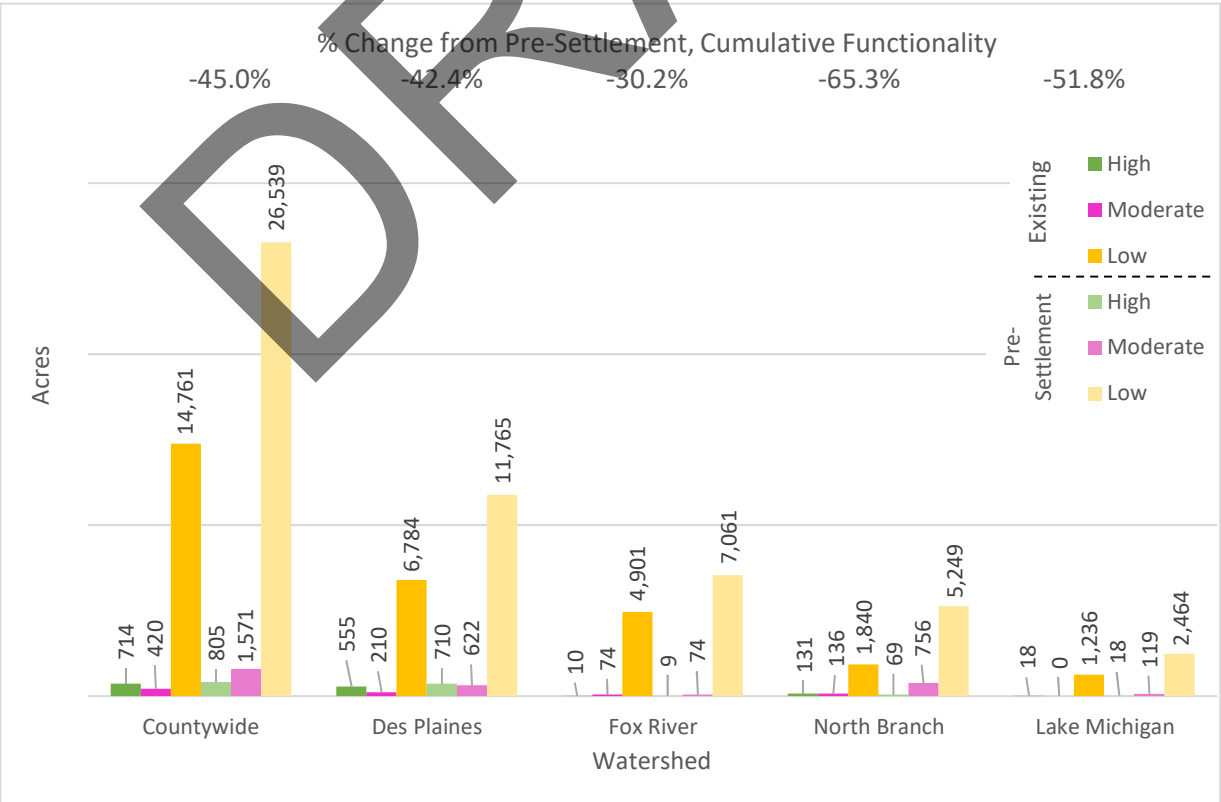
Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

# Woodland Amphibian Habitat Function Overview and Statistical Summary

The WRAPP Technical Advisory Group developed rating criteria for this function with a focus on sites that provide breeding habitat specifically for woodland amphibians (e.g., spotted salamanders, wood frog). In general, the ratings in the following chart are based on wetland size (2-acre threshold), wetland type, presence/absence of predators, and proximity to other wetlands on the local landscape.

| | | |
|---|---|---|
| **Woodland Amphibian Habitat** | High | • Woodland vernal pools < 2 acres that lack fish habitat AND within 500 feet of other wetlands or water bodies<br>• Seasonally to semi-permanently flooded flatwoods that lack fish habitat<br>• Ponds < 2 acres that lack fish habitat AND occur within 500 feet of other wetlands associated with woodlands |
| | Moderate | • Woodland vernal pools ≥ 2 acres within 500 ft of other wetlands AND lack good fish habitat<br>• Woodland vernal pools < 2 acres located more than 500 feet from other wetlands AND lack good fish habitat<br>• Seasonally to semi-permanently flooded flatwoods with Moderate fish habitat<br>• Seasonally to semi-permanently flooded ponds associated with woodlands AND have Moderate fish habitat<br>• Wetlands not rated High for fish AND contiguous to wetlands and water bodies rated High for amphibians<br>• Intermittent woodland streams contiguous to polygons rated High or Moderate for amphibians |
| | Low | • All remaining forested and scrub-shrub wetlands and mixes with forested or scrub-shrub AND not rated High for fish<br>• All remaining woodland ponds not rated High for fish |
| | N/A | • Any polygon rated High for fish<br>• All remaining wetlands and water bodies |

The chart below summarizes wetland acreage for the Woodland Amphibian Habitat function by significance levels for existing and pre-settlement wetlands. Percent change is cumulative across all levels of functionality for each watershed location. The exhibit on the following page illustrates the estimated extent of functional loss within Lake County, Illinois. Wetlands that are unchanged or have improved functionality are in green, and wetlands where functionality has been lost or reduced are shown in orange.

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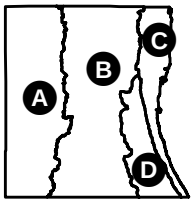
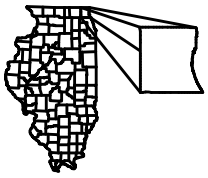
# Woodland Amphibian Habitat Wetland Functional Loss (Estimated), Lake County, Illinois.

- Wetland Function Lost or Reduced (Estimated)
- Wetland Function Unchanged or Improved (Estimated)
- Water Body, Wetland Function Unchanged (Estimated)



Major Watersheds in Lake County, Illinois:
A - Fox River
B - Des Plaines River
C- Lake Michigan
D - North Branch Chicago River

N

2 1 0 2 4 6 Miles