

# Lake County Wetland Restoration and Preservation Plan (WRAPP)

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Illinois Association for Floodplain & Stormwater Management

Tinley Park, Illinois

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A partial logo for Lake County, Illinois, featuring a blue arc on the left and a black arc on the right. The words "LAKE" and "COU" are visible in white text on the black background.

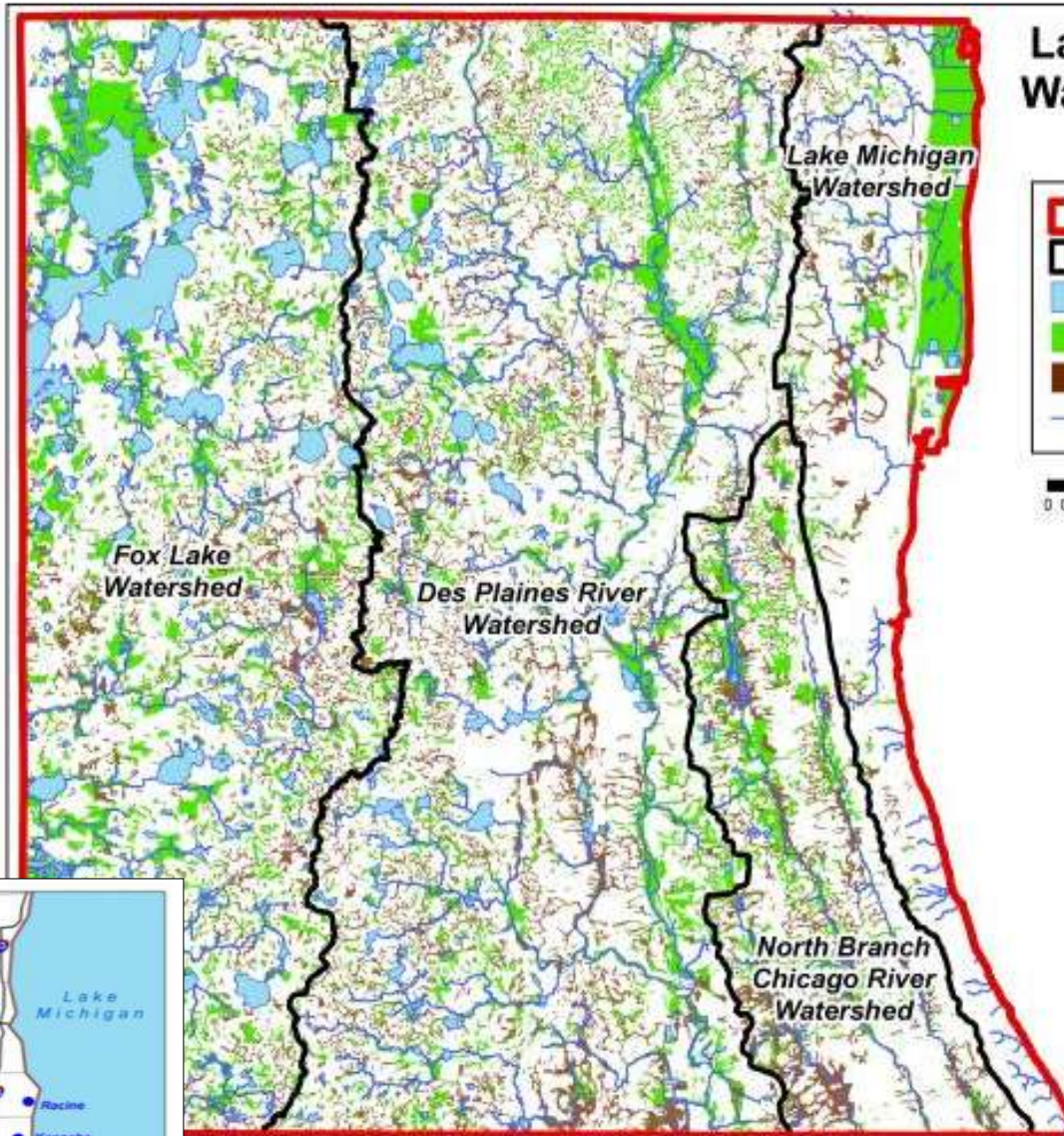
LAKE COU



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~ 21% of the County is wet

Lake County, IL



# Lake County, Illinois Waters and Wetlands

Countywide Wetland Preservation and Restoration Funding Request



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This map is provided for general informational purposes only. Map boundaries shown herein derived from various sources, each of which has its own scale and accuracy. The location of all features are approximate. Lake County Stormwater Management Commission revised January 21, 2009.

DATA SOURCES:  
Lake County Stormwater Management  
Lake County Department of Planning and Technology, U.S. Army Corps of Engineers





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# WRAPP Goal

*To provide a wide audience of end-users with decision-making support to help prioritize wetland restoration and preservation efforts.*



# What the WRAPP will **NOT** Do:

- ❖ Impose new development regulations
- ❖ Establish new protections for wetlands
- ❖ Recommend land acquisition or zoning changes
- ❖ Replace the need for a site-specific wetland delineation



# Why a WRAPP?

- ❖ Lake County has lost approximately half of the wetlands that existed prior to European settlement
- ❖ Lake County Policy: ***No Net Loss*** of Wetland acreage + ***Net Gain*** in Wetland Functions
- ❖ Action Item in 2002 Lake County Comprehensive Stormwater Management Plan
- ❖ Good baseline of wetland mapping but limited identification of functions or restoration opportunities



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# WRAPP Development Process

Input provided by 13-Member Technical Advisory Group ("TAG")

**Wetland  
Mapping &  
Classification**  
(GIS)

**Preliminary  
Assessment of  
Wetland  
Functions**  
(Desktop)

**Field Studies**  
(Refine Functional  
Assessment)

**Restoration  
Site ID &  
Prioritization**

**Summary  
Report**

**On-Line GIS  
Tool**





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# Wetland Mapping & Classification

## Step 1: Countywide Results

### Pre-settlement Wetlands

- 83,140 acres of wetland
- 13,500 acres of water bodies

### 2015 Wetlands

- 37,812 acres of wetland
- 21,900 acres of water bodies

**55% Loss of Wetland (45,328 acre loss)**

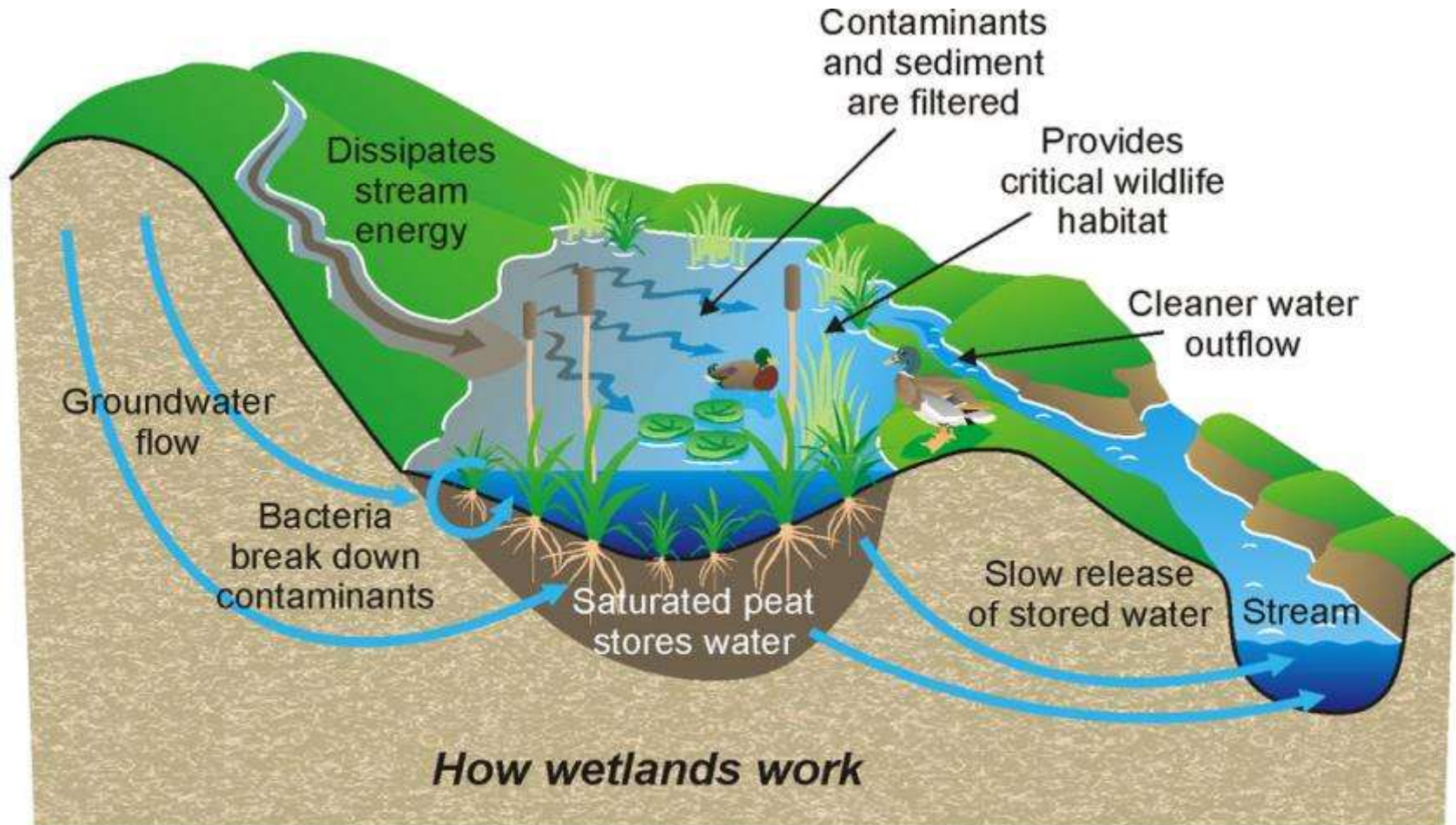
**62% Gain of Water Body Resource (8,400 acre gain)**



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# Wetland/Water Body Functions







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# Wetland/Water Body Functions

## Step 2a: Selection of Functions

Hydrologic Functions	Biodiversity Functions	Water Quality Functions
Flood Water Storage  Stream Baseflow Maintenance	<b>Native Fish Habitat</b>  Waterfowl Habitat  Other Wetland-dependent Bird Habitat  <b>Woodland Amphibian Habitat</b>  Unique Wetland Resources  Stream Shading  <b>Wildlife Movement Corridors</b>	<b>Nutrient Transformation (P- focus)</b>  Sediment & Other Particulate Retention  Shoreline/Stream Bank Stabilization  Carbon Sequestration



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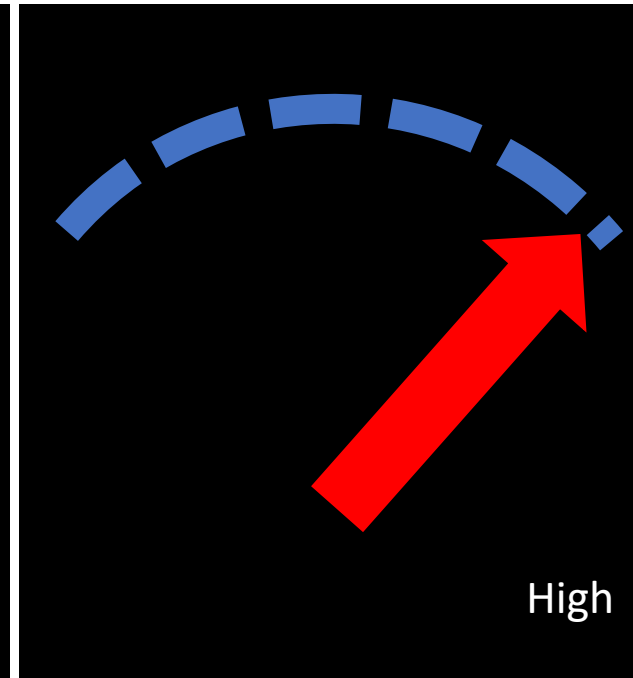
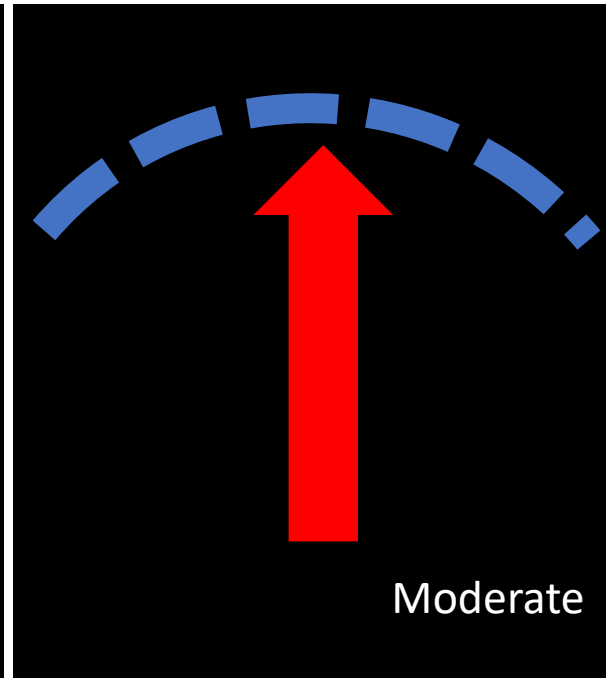
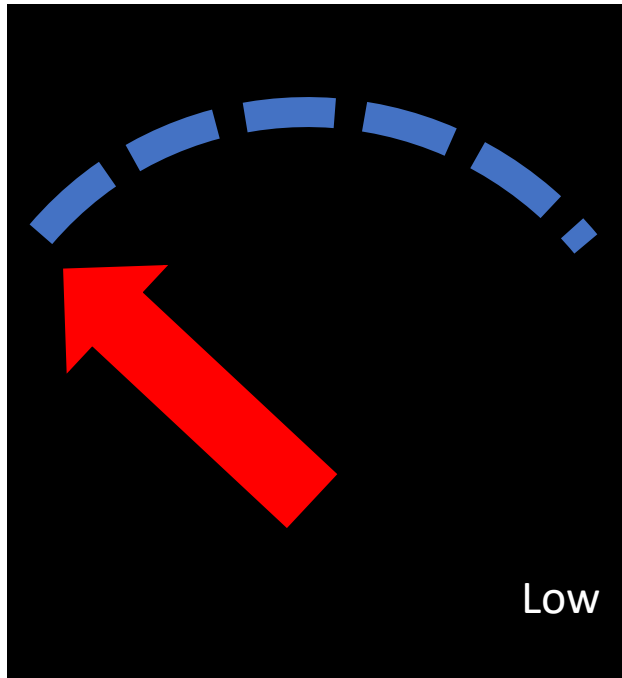
# Wetland/Water Body Functions

## Step 2b: Functional Significance Ratings

- ❖ Relative measure (comparing wetlands/water bodies to each other)
- ❖ Qualitative levels used, without regard to social values or quantitative limits.

**“High”** simply means **“performing process at a better/higher rate than other wetlands in the area”**

Wortman & Ashby, 2014





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# Wetland/Water Body Functions

## Step 2c: Functional Assessment Criteria

Flood Water Storage	High	<ul style="list-style-type: none"> <li>Wetlands &amp; waters associated with a mapped special flood hazard area, excluding slope wetlands</li> <li>Terrene basins with &gt; 0.75 acre-feet of storage</li> <li>Throughflow &amp; Throughflow-Intermittent ponds and associated basin, fringe, and island wetlands</li> <li>Polygons identified as stormwater basins</li> </ul>
	Moderate	<ul style="list-style-type: none"> <li>Wetlands &amp; waters that intersect the USGS flood of record not already rated High</li> <li>Wetlands &amp; waters associated with rivers, streams, and lakes with no mapped FEMA floodplain or outside of the mapped floodplain and not already rated high</li> <li>Flat wetlands outside of mapped floodplains</li> <li>All remaining Ponds not already ranked high or moderate</li> <li>Remaining fringe and island wetlands and remaining Lentic and Lotic wetlands</li> <li>Remaining Basin wetlands that are isolated or impounded and not slough wetlands</li> </ul>
	Low	<ul style="list-style-type: none"> <li>Remaining wetlands that are not slope wetlands, including slough wetlands</li> <li>Slope wetlands within FEMA 100 or 500 yr floodplain</li> </ul>
	N/A	<ul style="list-style-type: none"> <li>All remaining Slope wetlands</li> </ul>



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# Field Studies

## Step 3: Field Summary Sheet with Refined Ratings



48 Field Sites



### Site: DP-07

*Watershed:* Des Plaines River    *Sub-Watershed:* Upper Des Plaines River    *NWJ Class:* PEM/FO1C    *LLWW Class:* LR1FPbaTH

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

#### Functional Significance Ratings

- Flood Water Storage: **High**
- Stream Baseflow Maintenance: **Low**
- Nutrient Transformation (P): **High**
- Sediment and Other Particulate Retention: **High**
- Shoreline/Stream Bank Stabilization: **High**
- Carbon Sequestration: **Moderate**
- Native Fish Habitat: **Moderate**
- Waterfowl Habitat: **High**
- Other Wetland-Dependent Bird Habitat: **High**
- Woodland Amphibian Habitat: **Moderate**
- Unique Wetland Resources: **N/A**
- Stream Shading: **Low**
- Wildlife Movement Corridor: **High**





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# Restoration Site ID & Prioritization

## Step 4: Potentially Restorable Wetlands (PRWs)

PRW = Historic Wetlands & Water Bodies – Current Wetlands & Water Bodies – Recently Restored Areas



Potentially Restorable Wetlands



Flood Water Storage Functional Ratings



# Quick Demo of the WRAPP

A Walk-through of our Site





# DST Title Page

## Lake County Wetland Restoration and Preservation Plan ("WRAPP") Decision Support Tool ("DST") DRAFT Version 1.0

The WRAPP-DST is designed to provide a wide audience of end-users with an easy-to-use, interactive mapping tool to assist in identifying and prioritizing wetlands in Lake County, Illinois, for restoration or preservation. It integrates digital map data with other resource information to display the approximate extent of existing wetlands and water bodies and Potentially Restorable Wetlands ("PRW") in the county and characterizes these features according to their type/classification and the relative level to which they provide a variety of functions/services.

**Limitations:** The WRAPP is a county-wide planning effort that provides preliminary information suitable for initial site screening purposes. It does not provide the level of detail required to make definitive statements on the viability of a particular PRW. Whether or not a PRW identified by the WRAPP is viable will depend on site-specific characteristics, landowner interest, agency funding/priorities and other factors.

**Disclaimer:** The WRAPP-DST is not designed to be prescriptive. It is intended to be a *planning tool* to help users identify and prioritize wetland restoration or preservation efforts based on their specific goals and objectives. The WRAPP does not create any additional regulation or natural resource protections, does not replace the need for site-specific wetland delineations or jurisdictional determinations, and does not recommend any land acquisition or zoning changes. SMC does not warranty or guarantee the accuracy of existing wetland and water body or PRW map units in the DST, due to the county-wide scale at which the mapping was produced as well as changes in land use or landscape modifications since the mapping was completed.



Bottomland Flatwoods



Emergent Marsh



Lake and Island Wetland

I have read the Limitations and Disclaimer and am ready to enter the tool.

START



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# DST Landing Page



WRAPP Decision Support Tool \*DRAFT\*



Search Area of Interest



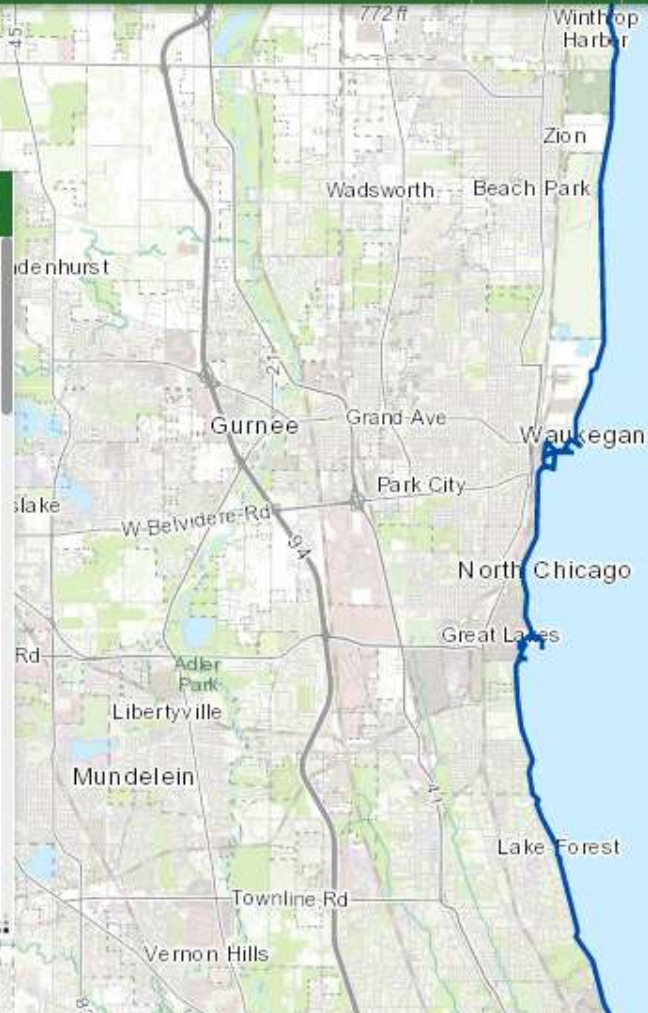
## Tutorial

**1) To Find your Area of Interest:** Type in desired location in the box and press 'Enter' to search; Use the dropdown arrow and select a more refined criteria from the list; Zoom to desired area on map; Use cursor to draw area on map

**2) Click on the '2' button to select which wetland dataset you'd like to view.**

**3) Click on the '3' button to view the 13 Wetland Functional Ratings for the PRW dataset.**

Where applicable: Red = High  
Orange = Moderate  
Yellow = Low







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# Area of Interest Search

WRAPP Decision Support Tool \*DRAFT\*

gurnee

Show search results for gurnee

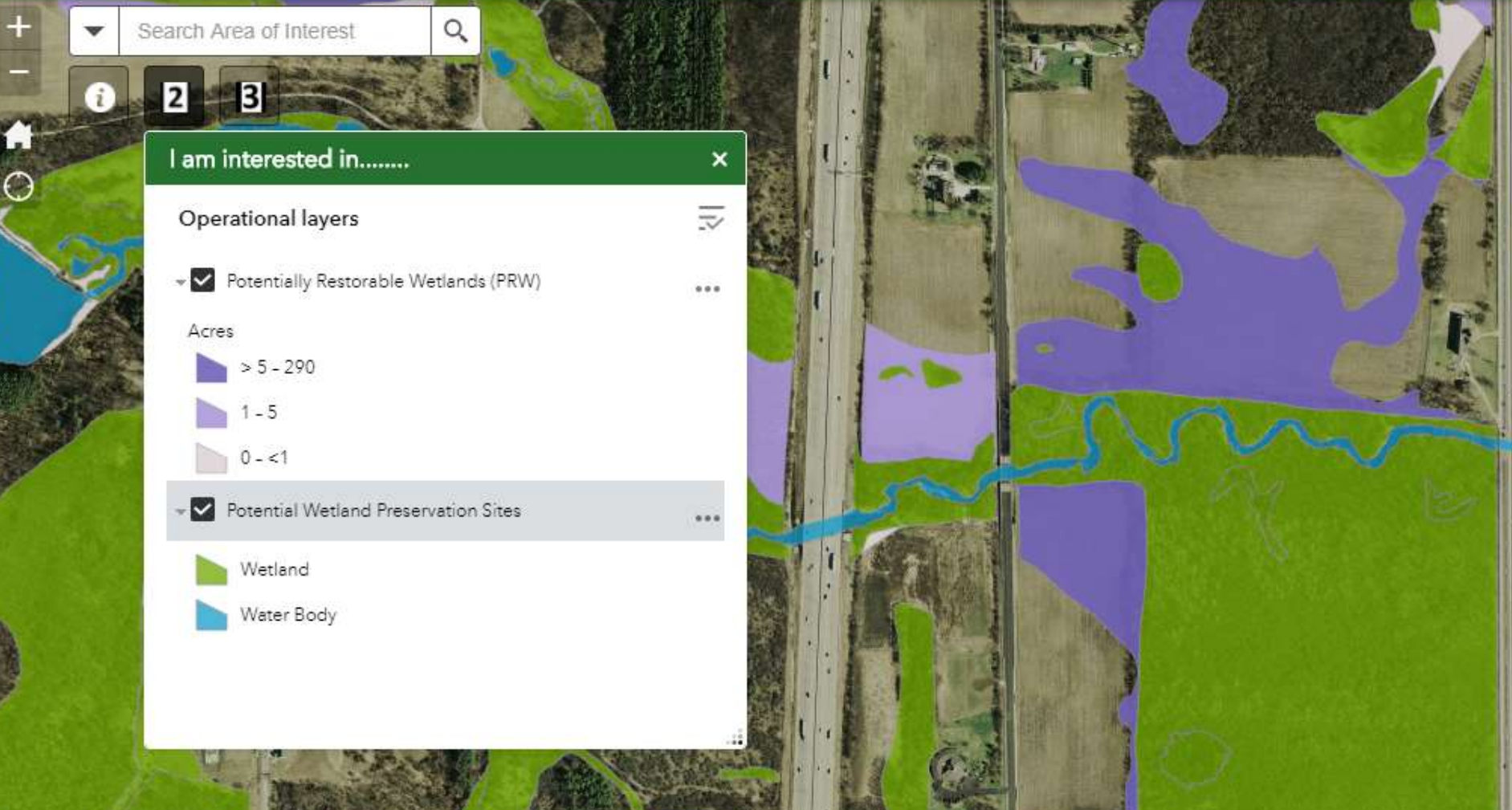
Municipalities: Village of Gurnee

Municipality Name	GURNEE
Total square feet of district	381,348,885.94
Square feet of district assessed as residential	138,876,247.71
Total value of district assessed as residential	836,507,134.01
Percent of district assessed as residential	36.42
Square feet of district assessed as commercial	70,177,995.39
Value of district assessed as commercial	256,070,614.01
Percent of district assessed as commercial	18.40
Square feet of district	17,214,315.20

[Zoom to](#)



# Potential Restoration & Preservation Sites





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# Functional Significance (PRWs)



WRAPP Decision Support Tool \*DRAFT\*



Search Area of Interest

i

2

3

## Wetland Function Ratings

### Operational layers

Carbon Sequestration

Flood Water Storage

 High

 Moderate

 Low

 N/A

Native Fish Habitat

Nutrient Transformation (P-focus)

Other Wetland-Dependent Bird Habitat

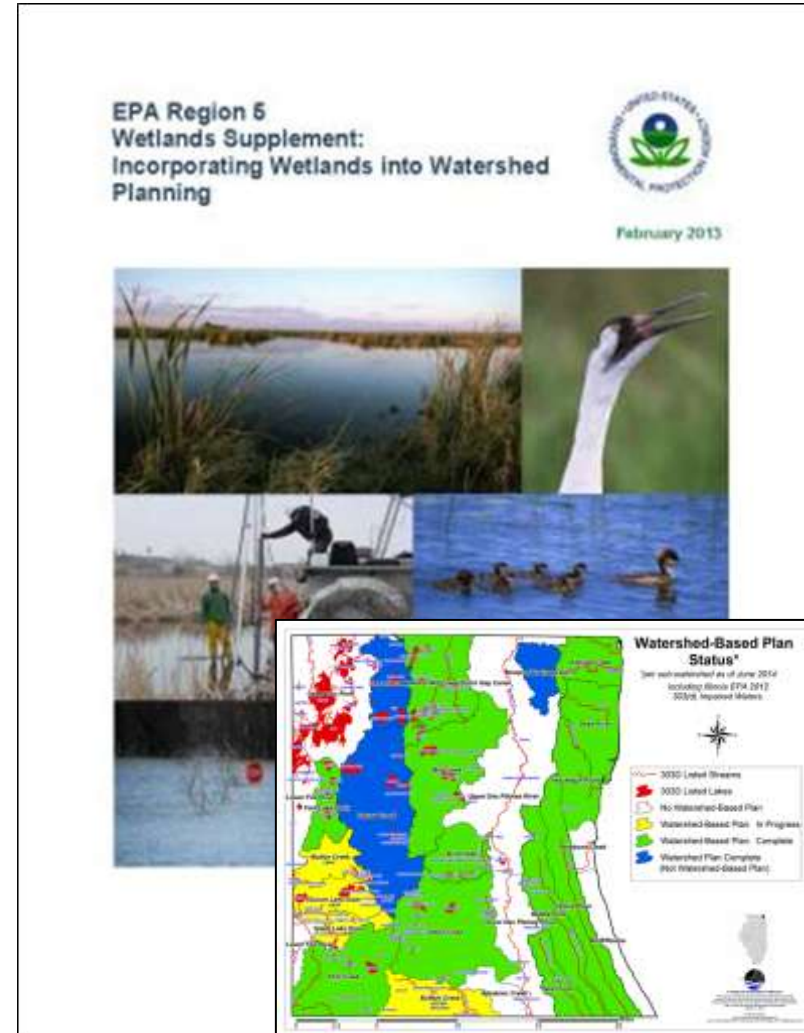


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# Using the WRAPP

## An SMC Watershed-based Planning Example

- ❖ An SMC **core mission**:  
implement watershed-based plans
- ❖ To date, a lack of uniform methods to identify/prioritize potential wetland restoration & enhancement sites
- ❖ WRAPP is concurrent with SMC's largest watershed planning effort (Des Plaines River)



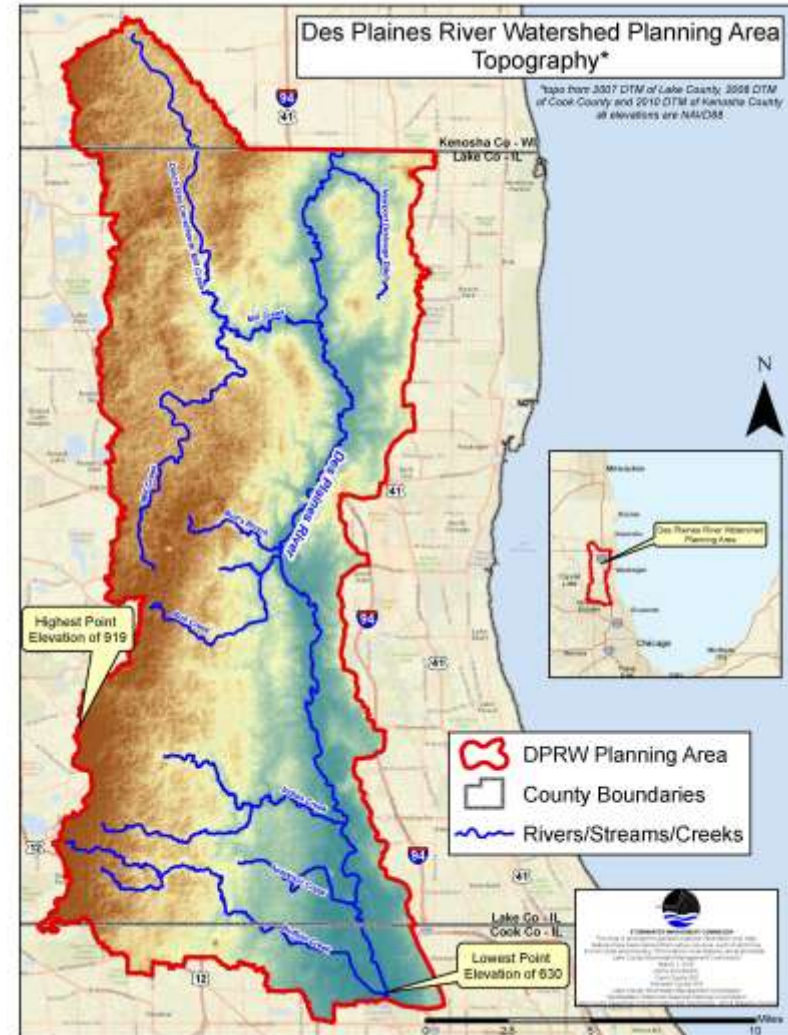


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# Using the WRAPP

## An SMC Watershed-based Planning Example

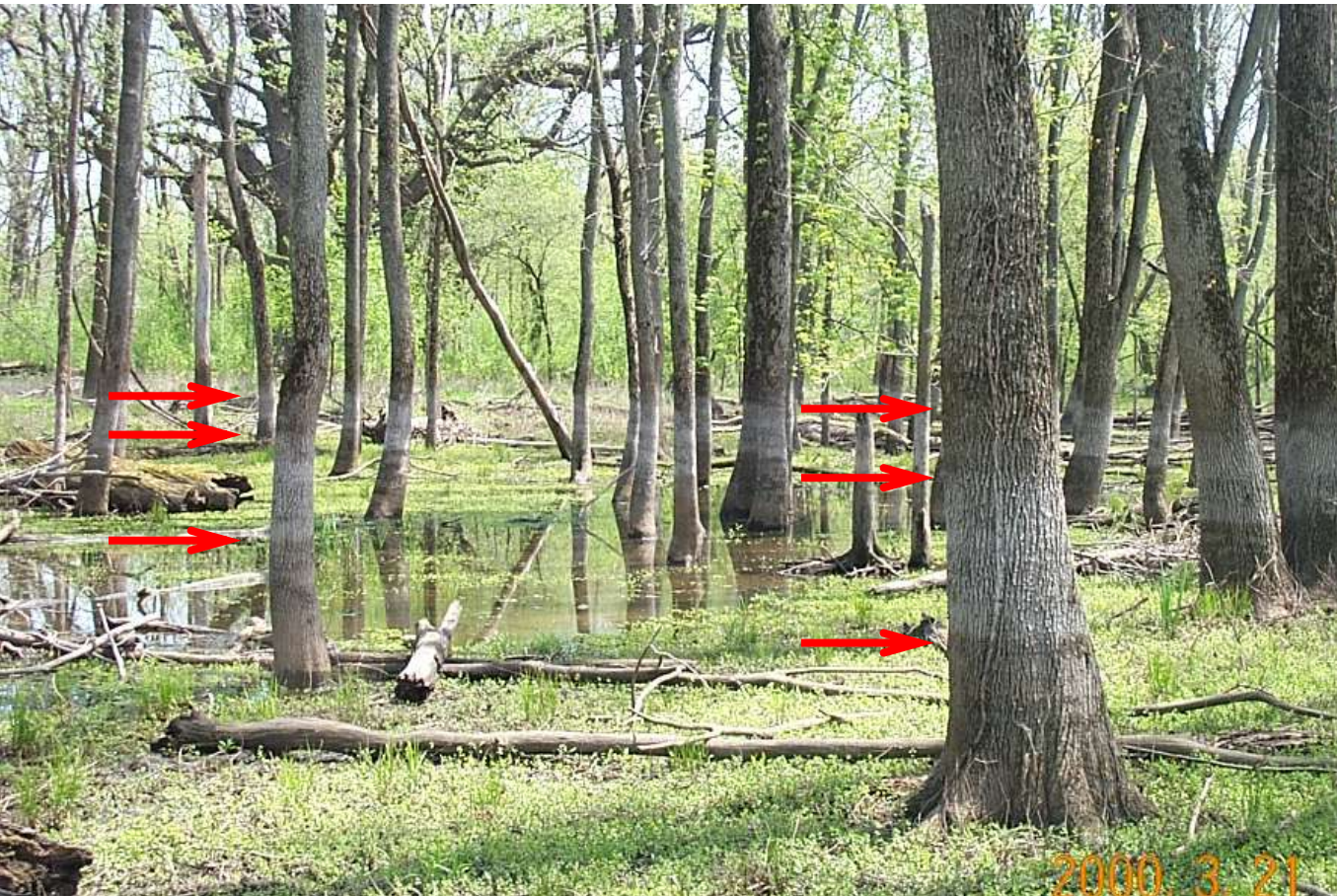
- ❖ Des Plaines River watershed planning effort (235 mi<sup>2</sup>)
  - Flooding is a long-standing concern, highlighted by 2017 events
  - Nutrients, sediment identified as water quality concerns





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# Flood Water Storage Function



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.

EPA estimates a 1-acre wetland can store about 1M gallons of flood water (~3.6 ac-ft)!!



# Using the WRAPP

## Watershed-based Planning: Site Prioritization

WRAPP Decision Support Tool \*DRAFT\*

Search Area of Interest

1 2 3

### Wetland Function Ratings

- Flood Water Storage
  - High
  - Moderate
  - Low
  - N/A
- Native Fish Habitat
- Nutrient Transformation (P-focus)
  - High
  - Moderate, Low, or N/A
- Other Wetland-Dependent Bird Habitat



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# Using the WRAPP

## Watershed-based Planning: Site Prioritization

WRAPP Decision Support Tool \*DRAFT\*

Search Area of Interest

1 2 3

### Wetland Function Ratings

- Flood Water Storage
  - High
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# Using the WRAPP

## Watershed-based Planning: Site Prioritization

WRAPP Decision Support Tool \*DRAFT\*

Search Area of Interest

2 3

Information Layers

- Boundary - Municipalities
- Boundary - Parks and Open Space
  - Opacity: 0% (opaque) to 100% (transparent)
  - Transparency
  - Disable pop-up
  - Move up
  - Move down
  - View in Attribute Table
  - Description
- Boundary - SMC Su
- Boundary - Townsh
- Boundary - Unincor
- Flood - Flood Haze
- Flood - Base Flood
- Flood - Cross-Sections
- Flood - Levees
- Flood - USGS Flood of Record

The image shows a screenshot of the WRAPP Decision Support Tool interface. The main map area displays various colored overlays on a satellite background, representing different planning layers. A search bar at the top left allows for finding an area of interest. On the right, the 'Information Layers' panel is open, showing a list of layers. The 'Boundary - Parks and Open Space' layer is selected and its opacity is being adjusted via a slider. A context menu is visible over this layer, offering options like 'Transparency', 'Disable pop-up', 'Move up', 'Move down', 'View in Attribute Table', and 'Description'. The map shows a large orange area, likely representing a flood hazard or high-priority site, and several yellow and green areas representing parks and open spaces.



# Key Points



- ❖ WRAPP qualitatively assesses existing and potentially restorable wetlands and water bodies for **13 functions**.
- ❖ **Technical Advisory Group's** local expertise and input were invaluable.
- ❖ **Field studies** were especially important for calibrating the functional assessment.
- ❖ This approach and DST could be adapted for use in other locations.
- ❖ Internal and External Beta **testing of Online Tool** – Spring/Summer 2018.





# Acknowledgements

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from a USEPA  
Region 5  
Wetlands  
Program  
Development  
Grant



## ❖ Technical Advisory Group Members:

- ✓ Mike Adam, LC Lakes Management Unit
- ✓ Jim Anderson, LC Forest Preserves
- ✓ Leslie Berns, LC Forest Preserves
- ✓ Mark Bramstedt, USDA NRCS
- ✓ Maggie Cole, IDNR
- ✓ Dennis Dreher, Geosyntec Consultants
- ✓ Sue Elston, USEPA
- ✓ Tom Ganfield, Baxter & Woodman, Inc.
- ✓ Rich Knodel, LC Mapping Services
- ✓ Dan Krill, LC PB&D
- ✓ Vince Mosca, Hey & Associates, Inc.
- ✓ Michael Murphy, USACE
- ✓ Darren Olson, Christopher B. Burke Engineering, Ltd.
- ✓ Shawn Cirton, USFWS (ad hoc)



# WRAPP Contacts

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## ❖ SMC Web Site:

<http://www.lakecountiyil.gov/Stormwater/Pages/default.aspx>