

Prepared by Emmons & Olivier Resources, Inc.
Prepared for Beaver Dam Lake Management District

Library Lake Southeast Stormwater Park Wetland Delineation Report

City of Cumberland, Barron County, Wisconsin



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EXECUTIVE SUMMARY

The purpose of this report is to provide Beaver Dam Lake Management District an evaluation of potential existing wetlands and jurisdictional waters of the **Study Area**. The Study Area includes the proposed grading extent of the proposed Library Lake Southeast Stormwater Park project and a buffer to account for contingencies and characterize the project vicinity (**Figure 1**). The Study Area represents the focus of this report; this report was not developed to evaluate areas beyond the Study Area.

EOR will share this report with the appropriate local, state, and federal agencies from which the need for future work, potential permits, concerns, and need for additional coordination and consultation will be determined.

Evaluation of the Study Area began with a review of existing data including digital elevation data, Soil Survey Geographic (SSURGO) hydric soil classification data, National Wetland Inventory (NWI) Data, and Wisconsin Wetland Inventory (WWI) data.

A Level 2 onsite delineation performed by EOR on July 28, 2020 identified one wetland within the Study Area consisting of four different wetland types. The wetland was located both above and below the OHWL of Parley Lake. EOR recommends submittal of this report to the LGU to validate the boundary of the delineated wetland and wetland types in relation to the proposed location of grading extents associated with the outlet stabilization.

1.1. Review Team and Contact Information

The wetland delineation was performed by Jimmy Marty and reviewed by Jason Naber of Emmons & Olivier Resources.

Wetland Delineators:

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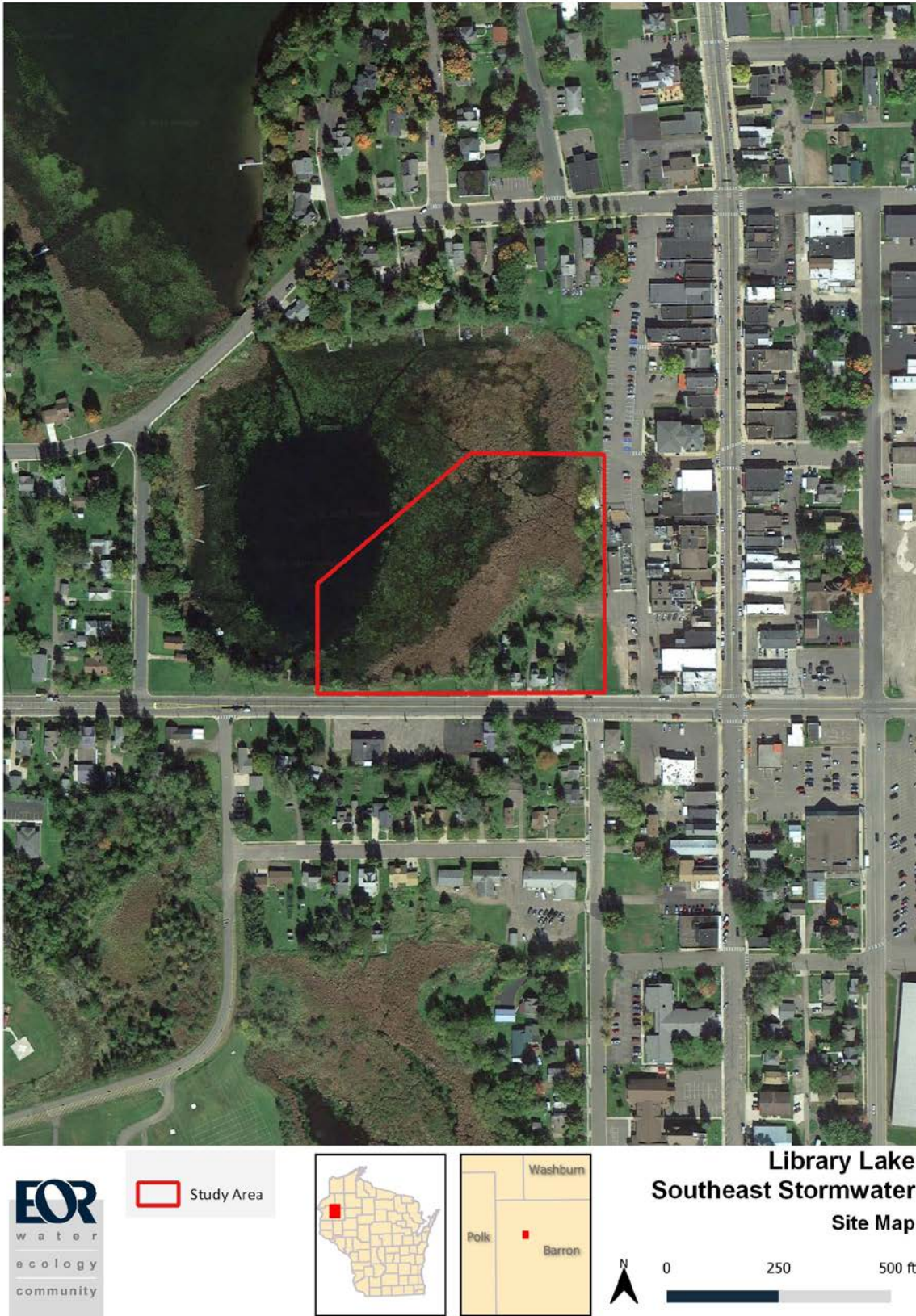


Figure 1. Library Lake Southeast Stormwater Park Study Area.

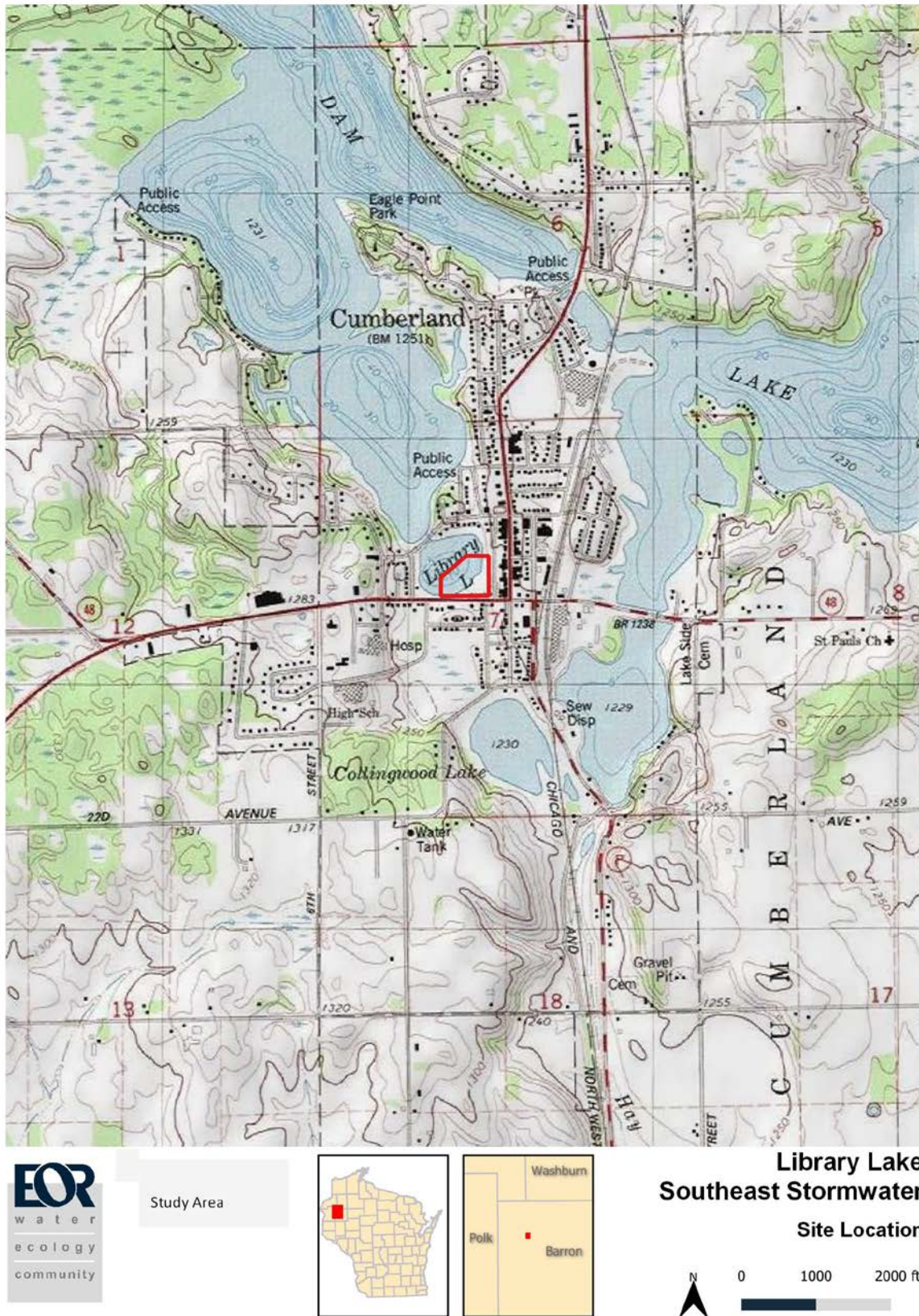


Figure 2. The Study Area is located northwest of the intersection of Wisconsin Highway 48 and 2nd Avenue.

2. INTRODUCTION

The proposed project consists of stormwater treatment improvements including an iron-enhanced-sand-filter basin, bioretention basin, rain garden, and wetland/lakeshore restoration. The Study Area is approximately 6.7 acres in size and includes the proposed grading extents of the project and buffer to account for contingencies and characterize the project vicinity. The Study Area is located northwest of the intersection of Wisconsin Highway 48 and 2nd Avenue within the City of Cumberland, Barron County, Wisconsin (**Figure 2**). The legal description is the SE ¼ of the NW ¼ of Section 7, Township 35N, Range 13W. The Study Area is located within five parcels: one owned by the City of Cumberland and four owned by the Beaver Dam Lake Management District.

3. METHODOLOGY

3.1. Preliminary Desktop Investigation

The following data were collected and reviewed prior to the field delineation:

- Barron County 2-foot elevation contours of Study Area vicinity (**Figure 3**)
- Natural Resources Conservation Service (NRCS) SSURGO hydric soil classification data (**Figure 3**)
- U.S. Fish and Wildlife Service (USFWS) NWI (**Figure 4**)
- Wisconsin Department of Natural Resources (WIDNR) Wisconsin Wetland Inventory (WWI) (**Figure 4**)

3.2. Onsite – Level 2 Wetland Delineation Methods

3.2.1. Data Collection and Tabulation

EOR followed methodology in accordance with the BWSR technical guidance documentation and methodology outlined in the 1987 Corps of Engineers Wetland Delineation Manual and supplemental methods identified in the Northcentral and Northeast Regional Supplement to delineate wetlands within the Study Area. Wetland and upland observations and data were recorded in the field and subsequently entered into the U.S. Army Corps of Engineers Automated Wetland Determination Data Form –Northcentral and Northeast. Sample points and delineated boundaries were collected in the field using a Virtual Reference Station corrected submeter differential Global Positioning System (GPS) and mapped using QGIS v. 3.10.

3.2.2. Wetland Indicator Methodology

EOR conducted field work on July 28, 2020 to identify wetland boundaries. A transect was established in a representative transition zone of each potential wetland. The transect consisted of sample point in the potential wetland, and if wetland criteria were met, one point in the upland. Soils, vegetation, and hydrology were documented at each sample point and provided in data sheets.

Vegetation

Observed plant species were identified and assigned corresponding Northcentral and Northeast Region wetland indicator status. The wetland probability indicator status of dominant plant species was determined using the 2016 National Wetland Plant List v3.3 (**Appendix A**).

Soils

Soil samples were collected using a soil auger and were dug to a minimum of 24 inches or until restrictive layers were met. Soil colors were determined using the Munsell Soil Color Charts. Soils were described to include those hydric indicators immediately below the A-horizon. A hydric soil determination was made based upon soil characterization (texture, color), soil order, ponding, and flooding frequency.

Hydrology

As required in the 1987 Manual, the presence of subsurface hydrology or indicators thereof was characterized in the rooting zone to a minimum of 24 inches. Primary and secondary hydrology indicators were identified according to the Midwest Supplement.

3.2.3. Delineation Boundary Determination

Wetland boundaries were determined via consideration of soil, hydrology, vegetation, topography, and professional judgment at paired upland and wetland sample points. Boundary GPS data was collected at sufficient and appropriate intervals, depending on curvature and assumed accuracy. The wetland boundary was flagged in the field.

4. RESULTS

4.1. Preliminary Desktop Investigation

4.1.1. Topography

The Study Area slopes to the north, northwest, and west toward Library Lake. Elevations range from 1,232 feet above sea level along the shore of Library Lake to 1,244 feet in the southeastern corner of the Study Area (**Figure 3**).

4.1.2. Soils Data

NRCS SSURGO data mapped two soil units within the Study Area (**Figure 3; Table 1**). Hydric ratings were based on those identified in the SSURGO database.

Table 1. NRCS Soils and Hydric Rating

Soil Unit	Hydric Classification	Percent Hydric	Drainage class
W- Water	-	-	-
CkB – Chetek sandy loam, 2 to 6 percent slopes	Not Hydric	0%	Somewhat excessively drained

4.1.3. Water Resources Data

Mapped water resources within the Study Area include a PEM1C-type freshwater emergent NWI wetland and a E2/A3H-type WWI wetland. These mapped wetlands share the same boundary and are in approximate alignment with Library Lake.



Figure 3. NRCS SSURGO soils data identified two soil units within the Study Area.



Figure 4. NWI and WWI water resources in the Study Area vicinity.

4.2. Onsite – Level 2 Wetland Delineation Results

The wetland delineation was conducted on July 28, 2020. Weather conditions were clear at the time of the delineation. Antecedent precipitation data from NRCS AgACIS WETS tables indicated the three month antecedent precipitation was wetter than normal prior to field work (**Table 2**).

Table 2. Antecedent Precipitation from NRCS AgACIS WETS tables.

Precipitation data for target wetland location:	
County: Barron	Township number: 35N
Township name: Cumberland	Range number: 13W
Nearest community: Cumberland	Section number: 7

Score using 1981-2010 normal period for July 28, 2020 site visit:

(Values are in inches)	1st prior month: June 2020	2 nd prior month: May 2020	3 rd prior month: April 2020
Estimated precipitation total for this location:	5.30*	3.84*	2.62*
There is a 30% chance this location will have less than:	3.17	2.66	1.83
There is a 30% chance this location will have more than:	5.24	4.28	3.37
Type of month: dry normal wet	wet	normal	normal
Monthly score	3 * 3 = 9	2 * 2 = 4	1 * 2 = 2
Multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	15 (Wet)		

*Totals derived from Rice Lake 0.6 SE weather station

4.3. Wetland Descriptions

EOR identified one wetland (**W1**) within the Study Area consisting of four wetland plant communities (**Figure 5** and **Figure 6**; **Table 3**). Data sheets and photographs are included in **Appendix B**.

Table 3. Delineated Wetlands

Wetland ID	Wetland Type			Area (acres)
	Eggers and Reed	Cowardin	Circular 39	
W1	Fresh (Wet) Meadow (Disturbed Subtype)	PEM1A	Type 1	0.46
	Shallow Marsh	PEM1C	Type 3	1.65
	Shrub-Carr	PSS1A	Type 6	0.06
	Shallow Open Water	PAB3H	Type 5	3.03
Total				5.20

Wetland **W1** consists primarily of open water and wetland fringe of Library Lake. A drainageway finger extends from the southeast area of the Study Area and originates from a seepage or unidentified outfall (**Figure 5**). One transect of three sample point was completed for Wetland **W1**.

Wetland sample point **W1A** was taken within the bottom of the depression at the base of the slope leading down toward Library Lake. The sample point was representative of a Shallow Marsh plant community. Vegetation at wetland sample point **W1A** was dominated by hybrid cattail (*Typha X glauca* - OBL) with jewelweed (*Impatiens capensis* - FACW), reed canary grass (*Phalaris arundinacea* - FACW), and bluejoint (*Calamagrostis canadensis* - OBL). Soils at **W1A** met the requirements of hydric indicator F1 (Loamy Mucky Mineral). One inch of surface water was present and hydrology indicators included primary indicators A1 (Surface Water) and A3 (Saturation) in addition to secondary indicators D2 (Geomorphic Position) and D5 (FAC-Neutral Test).

A second wetland sample point **W1B** was taken along the toe slope in the Fresh (Wet) Meadow (Disturbed Subtype) community. The paired upland sample point (**W01B**) was located on the top of the hummocky terrace. Vegetation at wetland sample point **W1B** was dominated by reed canary grass (*Phalaris arundinacea* - FACW) with minor occurrence of Canada thistle (*Cirsium arvense* - FACU) and lake sedge (*Carex lacustris* - OBL). Soils at **W1B** met the requirements of hydric indicator A11 (Depleted Below Dark Surface) and consisted of very dark black loam over a loamy sand depleted matrix. Saturation was observed at 22 inches and only secondary hydrology indicators D2 (Geomorphic Position) and D5 (FAC-Neutral Test) were observed.

Upland point **W1C** was taken along a foot slope and met hydrophytic vegetation and wetland hydrology criteria, but did not meet hydric soil criteria. Vegetation was dominated by reed canary grass along with Canada thistle. Hydrology met secondary indicators D2 (Geomorphic Position) and D5 (FAC-Neutral Test). The hydrology indicators were very marginal and geomorphic position was applied conservatively. Soils did not meet hydric criteria and consisted of very dark sandy loam over light brown sandy loam and loamy sand with some faint redox features. Gravel and mixed matrices below eleven inches suggested historical fill.

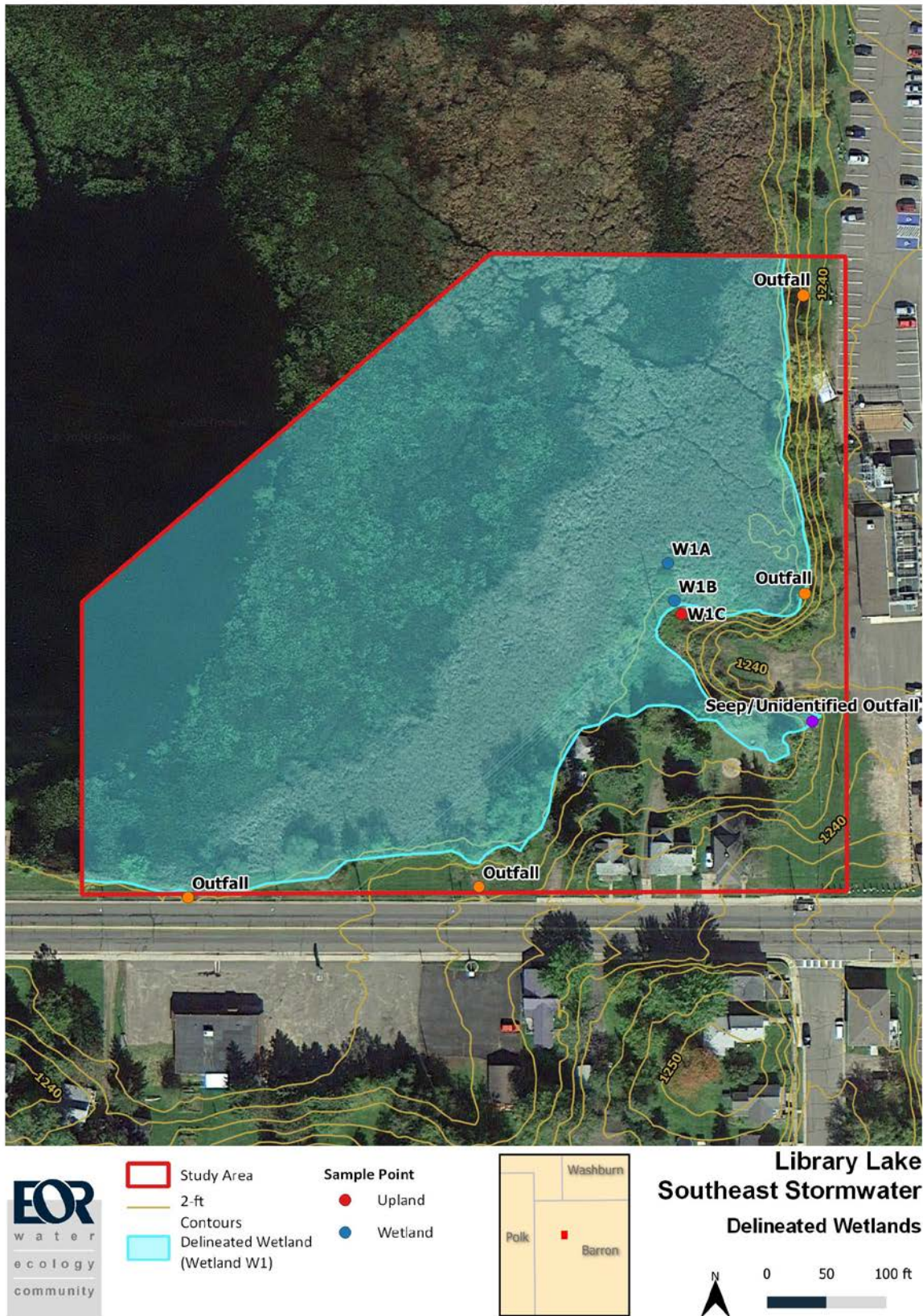


Figure 5. Delineated Wetlands

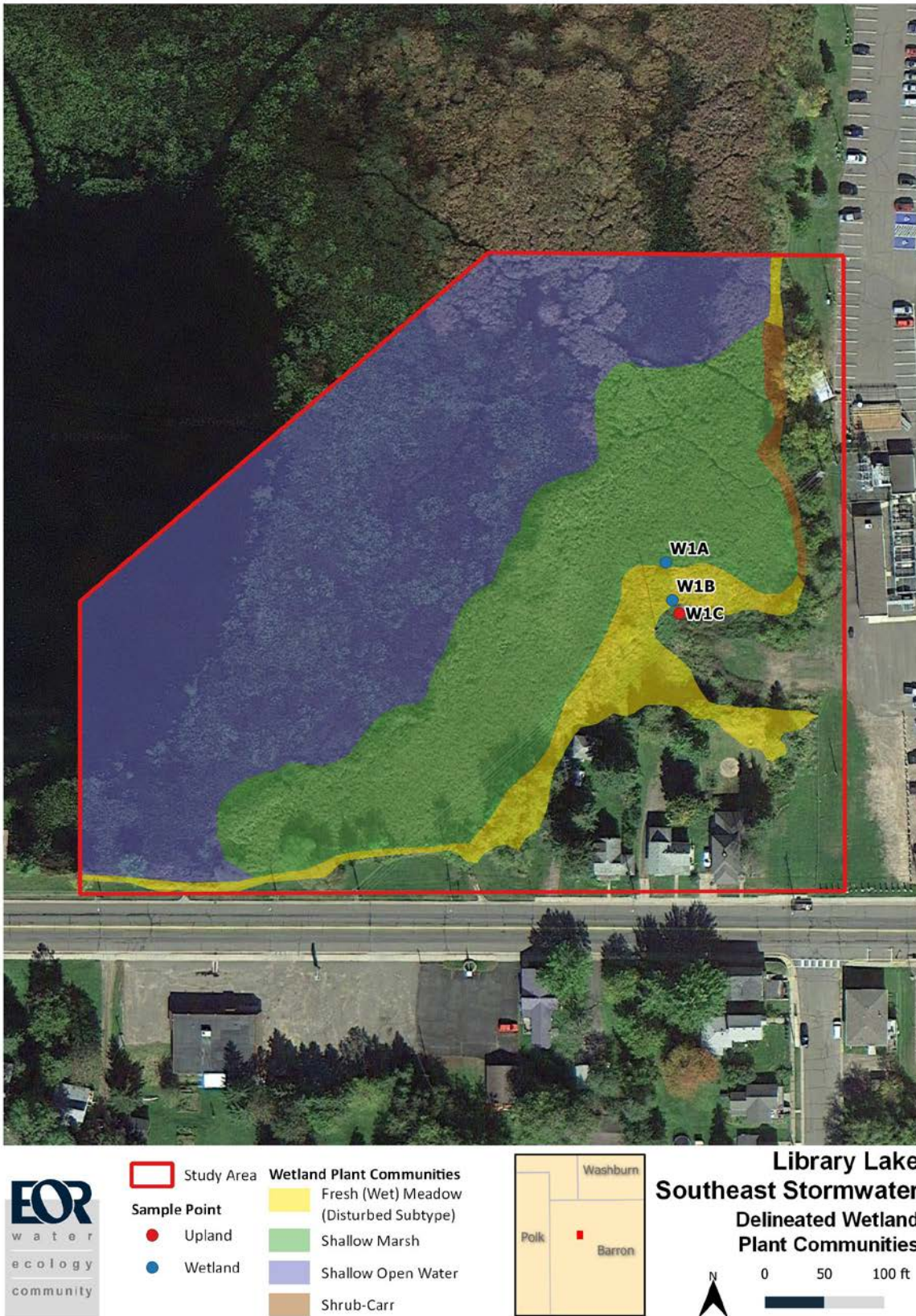


Figure 6. Eggers and Reed wetland plant communities within delineated wetland W1.

APPENDIX A: WETLAND PLANT INDICATOR CLASSES

Obligate Wetland (OBL)	Species occurs almost always (estimated probability >99%) in wetlands under natural conditions.
Facultative Wetland (FACW)	Species usually occurs in wetlands (estimated probability 67 to 99%) but occasionally found in non-wetlands.
Facultative (FAC)	Species equally likely to occur in wetlands and non-wetlands (estimated probability 34 to 66%).
Facultative Upland (FACU)	Species usually occurs in non-wetlands (estimated probability 67 to 99%) but occasionally is found in wetlands (estimated probability 1 to 33%).
Obligate Upland (UPL)	Species occurs in wetlands in other region but, under normal conditions, occur almost always (estimated probability >99%) in non-wetlands within the region specified. Species that do not occur in wetlands in any region are not found on the National List.
No Indicator Status (NI)	Insufficient information available to establish indicator status.

APPENDIX B: WETLAND DETERMINATION DATA FORMS AND PHOTOGRAPHS

Wetland W1

Complex of Wet Meadow,
Shallow Marsh, Shrub-
Carr, & Shallow Open
Water

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Library Lake Southeast Stormwater City/County: Cumberland/Barron Sampling Date: 7/28/2020
 Applicant/Owner: Beaver Dam Lake Management District State: WI Sampling Point: W1A
 Investigator(s): Jimmy Marty, CMWP Section, Township, Range: S7 T35N R13W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave
 Slope (%): <1 Lat.: 576269.23 E Long.: 5042650.21 N Datum: NAD83 UTM Zone 15 (m)
 Soil Map Unit Name: W (Water) NWI Classification: None
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation , soil , or hydrology significantly disturbed? Are "normal
 Are vegetation , soil , or hydrology naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u> </u> <u>Y</u> Hydric soil present? <u> </u> <u>Y</u> Indicators of wetland hydrology present? <u> </u> <u>Y</u>	Is the sampled area within a wetland? <u> </u> <u>Y</u> If yes, optional wetland site ID: <u> </u> <u>W1</u>
Remarks: (Explain alternative procedures here or in a separate report.) <p style="text-align: center;">Wet antecedent climate. Sample point located just beyond NWI wetland (PEM1C) and WWI (E2/A3H) wetland.</p>	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> </u> <u>1</u> Water table present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> </u> <u>0</u> Saturation present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> </u> <u>0</u> (includes capillary fringe)	Indicators of wetland hydrology present? <u> </u> <u>Y</u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION - Use scientific names of plants

Sampling Point: W1A

Tree Stratum	Plot Size (30 ft)	Absolute % Cover	Dominant Species	Indicator Status																		
1					50/20 Thresholds <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:60%;"></td> <td style="width:20%; text-align: center;">20%</td> <td style="width:20%; text-align: center;">50%</td> </tr> <tr> <td>Tree Stratum</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Sapling/Shrub Stratum</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Herb Stratum</td> <td style="text-align: center;">21</td> <td style="text-align: center;">53</td> </tr> <tr> <td>Woody Vine Stratum</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> </table>				20%	50%	Tree Stratum	0	0	Sapling/Shrub Stratum	0	0	Herb Stratum	21	53	Woody Vine Stratum	0	0
	20%	50%																				
Tree Stratum	0	0																				
Sapling/Shrub Stratum	0	0																				
Herb Stratum	21	53																				
Woody Vine Stratum	0	0																				
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10		0 = Total Cover																				
Sapling/Shrub Stratum	Plot Size (15 ft)	Absolute % Cover	Dominant Species	Indicator Status																		
1					Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across all Strata: <u>1</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)																	
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10		0 = Total Cover																				
Herb Stratum	Plot Size (5 ft)	Absolute % Cover	Dominant Species	Indicator Status																		
1	<i>Typha X glauca</i>	80	Y	OBL	Prevalence Index Worksheet Total % Cover of: OBL species <u>85</u> x 1 = <u>85</u> FACW species <u>20</u> x 2 = <u>40</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>105</u> (A) <u>125</u> (B) Prevalence Index = B/A = <u>1.19</u>																	
2	<i>Impatiens capensis</i>	10	N	FACW																		
3	<i>Phalaris arundinacea</i>	10	N	FACW																		
4	<i>Calamagrostis canadensis</i>	5	N	OBL																		
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15		105 = Total Cover																				
Woody Vine Stratum	Plot Size (30 ft)	Absolute % Cover	Dominant Species	Indicator Status																		
1					Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic																	
2																						
3																						
4																						
5		0 = Total Cover																				
Remarks: (Include photo numbers here or on a separate sheet)					Definitions of Vegetation Strata: Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines - All woody vines greater than 3.28 ft in height.																	
					Hydrophytic vegetation present? <u>Y</u>																	

SOIL

Sampling Point: W1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-4	10YR 2/1	100					peat	
4-14	10YR 2/1	100					mucky loamy sand	
14-20	10YR 5/1	100					loamy fine sand	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11) (LRR K, L)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Library Lake Southeast Stormwater City/County: Cumberland/Barron Sampling Date: 7/28/2020
 Applicant/Owner: Beaver Dam Lake Management District State: WI Sampling Point: W1B
 Investigator(s): Jimmy Marty, CMWP Section, Township, Range: S7 T35N R13W
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): concave
 Slope (%): 1-2 Lat.: 576270.90 E Long.: 5042640.55 N Datum: NAD83 UTM Zone 15 (m)
 Soil Map Unit Name: CkB (Chetek sandy loam, 2-6 percent slopes) NWI Classification: None
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation , soil , or hydrology significantly disturbed? Are "normal
 Are vegetation , soil , or hydrology naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u> </u> <u>Y</u> Hydric soil present? <u> </u> <u>Y</u> Indicators of wetland hydrology present? <u> </u> <u>Y</u>	<p align="center">Is the sampled area within a wetland? <u> </u> <u>Y</u></p> If yes, optional wetland site ID: <u> </u> <u>W1</u>
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center">Wet antecedent precipitation.</p>	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes <u> </u> No <u> </u> Depth (inches): <u> </u> Water table present? Yes <u> </u> No <u> </u> Depth (inches): <u> </u> Saturation present? Yes <u> </u> <u>X</u> No <u> </u> Depth (inches): <u> </u> <u>22</u> (includes capillary fringe)	<p align="center">Indicators of wetland hydrology present? <u> </u> <u>Y</u></p>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION - Use scientific names of plants

Sampling Point: W1B

Tree Stratum	Plot Size (30 ft)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Sapling/Shrub Stratum	Plot Size (15 ft)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Herb Stratum	Plot Size (5 ft)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Woody Vine Stratum	Plot Size (30 ft)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				

50/20 Thresholds		
	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	20	51
Woody Vine Stratum	0	0

Dominance Test Worksheet	
Number of Dominant Species that are OBL, FACW, or FAC:	<u>1</u> (A)
Total Number of Dominant Species Across all Strata:	<u>1</u> (B)
Percent of Dominant Species that are OBL, FACW, or FAC:	<u>100.00%</u> (A/B)

Prevalence Index Worksheet		
Total % Cover of:		
OBL species	<u>1</u> x 1 =	<u>1</u>
FACW species	<u>100</u> x 2 =	<u>200</u>
FAC species	<u>0</u> x 3 =	<u>0</u>
FACU species	<u>1</u> x 4 =	<u>4</u>
UPL species	<u>0</u> x 5 =	<u>0</u>
Column totals	<u>102</u> (A)	<u>205</u> (B)
Prevalence Index = B/A =	<u>2.01</u>	

Hydrophytic Vegetation Indicators:
 ___ Rapid test for hydrophytic vegetation
 Dominance test is >50%
 Prevalence index is ≤3.0*
 ___ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
 ___ Problematic hydrophytic vegetation* (explain)
 *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: W1B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-8	10YR 2/1	100					loam	very dark black
8-22	10YR 5/2	95	7.5YR 3/4	5	C	PL	loamy sand	moist, not saturated
22-26	10YR 5/2	90	7.5YR 3/4	5	C	PL	loamy sand	saturated
			5YR 4/6	5	C	PL		

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric soil present? Y

Remarks:

Redox concentrations occur as large pockets

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Library Lake Southeast Stormwater City/County: Cumberland/Barron Sampling Date: 7/28/2020
 Applicant/Owner: Beaver Dam Lake Management District State: WI Sampling Point: W1C
 Investigator(s): Jimmy Marty, CMWP Section, Township, Range: S7 T35N R13W
 Landform (hillslope, terrace, etc.): footslope Local relief (concave, convex, none): concave
 Slope (%): 1-2 Lat.: 576272.72 E Long.: 5042637.14 N Datum: NAD83 UTM Zone 15 (m)
 Soil Map Unit Name: CkB (Chetek sandy loam, 2-6 percent slopes) NWI Classification: None
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u> Hydric soil present? <u>N</u> Indicators of wetland hydrology present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>W1</u>
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center">Wet antecedent precipitation.</p>	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes _____ No _____ Depth (inches): _____ Water table present? Yes _____ No _____ Depth (inches): _____ Saturation present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Indicators of wetland hydrology present? <u>Y</u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available: <p align="center">Marginal geomorphic position</p>	
Remarks:	

VEGETATION - Use scientific names of plants

Sampling Point: W1C

Tree Stratum						50/20 Thresholds		
Plot Size (30 ft)	Absolute % Cover	Dominant Species	Indicator Status	20%	50%			
1 _____	_____	_____	_____	Tree Stratum	0	0		
2 _____	_____	_____	_____	Sapling/Shrub Stratum	0	0		
3 _____	_____	_____	_____	Herb Stratum	21	53		
4 _____	_____	_____	_____	Woody Vine Stratum	0	0		
5 _____	_____	_____	_____					
6 _____	_____	_____	_____					
7 _____	_____	_____	_____					
8 _____	_____	_____	_____					
9 _____	_____	_____	_____					
10 _____	_____	_____	_____					
<u>0</u> = Total Cover								
Sapling/Shrub Stratum						Dominance Test Worksheet		
Plot Size (15 ft)	Absolute % Cover	Dominant Species	Indicator Status	Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A)				
1 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>1</u> (B)				
2 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)				
3 _____	_____	_____	_____					
4 _____	_____	_____	_____					
5 _____	_____	_____	_____					
6 _____	_____	_____	_____					
7 _____	_____	_____	_____					
8 _____	_____	_____	_____					
9 _____	_____	_____	_____					
10 _____	_____	_____	_____					
<u>0</u> = Total Cover								
Herb Stratum						Prevalence Index Worksheet		
Plot Size (5 ft)	Absolute % Cover	Dominant Species	Indicator Status	Total % Cover of:				
1 <i>Phalaris arundinacea</i>	100	Y	FACW	OBL species	<u>0</u> x 1 =	<u>0</u>		
2 <i>Cirsium arvense</i>	5	N	FACU	FACW species	<u>100</u> x 2 =	<u>200</u>		
3 _____	_____	_____	_____	FAC species	<u>0</u> x 3 =	<u>0</u>		
4 _____	_____	_____	_____	FACU species	<u>5</u> x 4 =	<u>20</u>		
5 _____	_____	_____	_____	UPL species	<u>0</u> x 5 =	<u>0</u>		
6 _____	_____	_____	_____	Column totals	<u>105</u> (A)	<u>220</u> (B)		
7 _____	_____	_____	_____	Prevalence Index = B/A =	<u>2.10</u>			
8 _____	_____	_____	_____					
9 _____	_____	_____	_____					
10 _____	_____	_____	_____					
11 _____	_____	_____	_____					
12 _____	_____	_____	_____					
13 _____	_____	_____	_____					
14 _____	_____	_____	_____					
15 _____	_____	_____	_____					
<u>105</u> = Total Cover								
Woody Vine Stratum						Hydrophytic Vegetation Indicators:		
Plot Size (30 ft)	Absolute % Cover	Dominant Species	Indicator Status	<input type="checkbox"/> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic				
1 _____	_____	_____	_____					
2 _____	_____	_____	_____					
3 _____	_____	_____	_____					
4 _____	_____	_____	_____					
5 _____	_____	_____	_____					
<u>0</u> = Total Cover								
Definitions of Vegetation Strata:						Hydrophytic vegetation present?		
Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines - All woody vines greater than 3.28 ft in height.						<u>Y</u>		
Remarks: (Include photo numbers here or on a separate sheet)								

SOIL

Sampling Point: W1C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-11	10YR 2/1	100					sandy loam	
11-14	10YR 4/3	70	10YR 4/2	10	D	PL	sandy loam	faint depletions
			10YR 4/4	10	C	PL		faint redox
			10YR 2/1	10				mixed matrix
14-18	10YR 3/3	95	10YR 2/1	5			sandy loam	mixed matrix w/gravel
18-26	10YR 4/3	95	7.5YR 3/4	5	C	PL	loamy sand	moist;redox in large pockets

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
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Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric soil present? N

Remarks:

Soils suggest history of disturbance/fill due to mixed matrices and gravel



Overview of sample point W1B looking north toward W1A.



Wetland sample point W1A.



Wetland sample point W1B.



Overview of upland sample point W1C looking south across wetland boundary.



Upland sample point W1C.



Overview of W1C looking toward W1B.



Overview of wetland W1 near sample points.



Overview of wetland boundary looking east from southwest extent.



Overview of wetland boundary looking south from northeast extent



Overview of drainageway extending from downtown Cumberland, looking southwest.



Overview of wetland boundary near residential properties.