Perch Lake Wetland Delineation for St. Louis River RAP Projects

This report has been modified from the original, to create an accessible version

St. Paul District
Regulatory Branch

6 January 2016

MEMORANDUM

SUBJECT: *Perch Lake Wetland Delineation for St. Louis River RAP Projects, St. Louis County, Minnesota, on behalf of the Detroit District USACE*

1. Introduction.

The U.S. Army Corps of Engineers, St. Paul District Regulatory Branch conducted a wetland delineation on behalf of the Detroit District Planning Branch for four project areas proposed within and adjacent to the St. Louis River in St. Louis County, Minnesota at the following sites: 21st Avenue, 40th Avenue, Kingsbury Bay, and Perch Lake. **The purpose of this memorandum is to document the methods used and conclusions made regarding the extent of wetlands present at the Perch Lake site.**

The area of investigation (AOI) for the Perch Lake site encompasses approximately 21 acres as shown on Figures 1 and 1a (Appendix A), and is located in part of the S½ of the SW¼ of Section 4, and part of the N ½ of Section 9, T. 48N., R. 15W., St. Louis County, Minnesota.

2. Methods and Materials.

The wetland delineation was conducted using a combination of on-site and off-site methods detailed below.

On-site procedures were conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (*Corps Manual*) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North Central and Northeast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). The Corps staff team conducted the on-site data collection on Wednesday, October 14, 2015. Off-site wetland determination methods using aerial photography and elevation data, coupled with field verification, were employed to determine the extent of wetlands in areas where access was not permitted.

The following resources were utilized for the wetland delineation:

- ArcMap 10.2.2 FSA 1991, 2002, 2006, 2008, 2009, 2010, 2013, 2015 aerial photographs
- Google Earth (version 7.1.5.1557) 1991, 2003, 2004, 2006, 2008, 2009, 2011, 2012, 2015 true color aerial photographs;
- DNR Landview Aerial Photography 1940, 1948, 1972, 1981, 1989
- Minnesota Climatology Working Group Website (http://climate.umn.edu/gridded_data/precip/wetland/wetland.asp) "Wetland Delineation Precipitation Data Retrieval";
- National Wetlands Inventory (NWI) mapping;
- MN Department of Natural Resources (DNR) Public Waters Inventory;
- USDA Web Soil Survey digital soil mapping;
- St. Louis County LiDAR data
- Trimble Geoexplorer XT GPS unit to record the locations of data points and wetland/upland boundaries during field investigation
- ArcMap 10.2.2 GIS program to digitize and display the results of the investigation.

In addition, the following methods were used:

a. Placing Observations of Hydrology in the Context of Antecedent Precipitation. *Hydrology Tools for Wetland Determination* (Woodward *et al*. 1997) and *Assessing and Using Meteorological Data to Evaluate Wetland Hydrology* (Sprecher and Warne 2000) recommend evaluation of precipitation for the 3 months prior to the date of the aerial imagery to assist in making determinations regarding signatures noted on aerial photography. The Minnesota Climatology Working Group website was used to determine antecedent precipitation for the site visit as well as any aerial photography reviewed. Direct observations of hydrology indicators made during the site visit were then placed in the context of antecedent precipitation.

3. Landscape and Soils.

The Perch Lake site is located upstream along the St. Louis River at the southernmost end of the City of Duluth. Perch Lake was once a part of the St. Louis River prior to the construction of Trunk Highway 23, which created an artificial separation of the two water bodies, except for the remaining surficial connection through a culvert under the highway. Otherwise, there does not appear to have been excavation or fill impacts to the Perch Lake basin itself. Virtually all of the residential lots and roads currently located around the perimeter of Perch Lake appear to have been established as early as the late 1930s. As evidenced in the 1948 aerial photograph (Photo 2), early settlement of the area included attempts to clear and drain the areas north of Perch Lake, around the residential development. Remnants of the swales dug to foster the drainage were evident in the forested areas investigated north of Perch Lake during the on-site data collection.

Photo 1: July, 1940 Aerial, Perch Lake Road and residences in place

Photo 2: August, 1948 Aerial, where shallow swales for drainage from the north into the Perch Lake basin are evident.

The site is located within the Glacial Lake Superior Plain Subsection of the Laurentian Mixed Forest Province, as described in accordance with the Minnesota Department of Natural Resources (DNR) Ecological Classification System. Because this site lies at the edge of the Glacial Lake Superior Basin, native soils are developed from lacustrine clays and sandy beaches of the ancient lake bed. Soils mapped within the project area are listed in the table below and are shown on Figure 2 in Appendix A.

Mapped soils in Project Area

Map Unit Symbol	Map Unit Name (Perch Lake)	Hydric Percent of Map Unit
1026A	Udifluvents, loamy, 0 to 2 percent slopes, occasionally flooded	20%, flood plains
1034A	Udifluvents and Fluvaquents, loamy, 0 to 2 percent slopes, rarely flooded	25%, flood plains
E24F	Miskoaki-Cuttre-Rock complex, 5 to 45 percent slopes	0%

4. NWI and DNR Mapping.

The NWI mapped approximately 12.8 acres of wetlands within the project area, as shown on Figure 3. Perch Lake is also included on the DNR Public Waters Inventory as wetland 975-W. No trout streams are near Perch Lake, however, the St. Louis River has special fishing regulations identified at the location where Perch Lake outlets into the River.

5. Site Visit 14 October 2015.

Access was only granted, as shown on Exhibit "A" in Appendix B, for the western portion of the site, virtually all of which is wetland. Data collection in this area resulted in only one data sheet, documenting the presence of wetland as far as the uppermost point within the AOI. The vegetation at this point documents the transition from the marsh and shrub carr through the forested wetland trending toward upland outside of the AOI. The topography rises steeply on the eastern portion of the AOI and, viewed from the public right-of-way, provided the correlation with off-site resources, including LiDAR, to complete the wetland delineation. Precipitation during the three months antecedent to the site visit on 14 October 2015 was wetter than normal (see Appendix B).

6. Results and Discussion.

Wetland resources were identified and delineated within the project area as shown on Figure 1a – Perch Lake Area of Investigation and Figure 1b – Perch Lake Wetlands. The resources were identified using on-site data collection methods as well as off-site review of all available aerial photography coupled with LiDAR elevation data. The identification of wetlands was based on field documentation of the vegetation, soils and topography.

Within the AOI of the Perch lake site, two wetlands (Table 1) were identified consisting of shallow marsh, shrub-carr and wooded swamp. Perch Lake itself is a deep marsh to shallow open water wetland, below the boundaries of the AOI. The St. Louis River abuts the southern boundary of the AOI, where there are no persistent wetland resources along the banks of the River. The wetland resources investigated are briefly described below:

The delineation was based on evidence of the changes in vegetation and topography between the wetland and upland areas. Dominant vegetation observed includes black willow (*Salix nigra*, OBL) and other willow species (*Salix spp.*), balsam poplar (*Populus balsamifera*, FACW), cattail species (*Typha spp*, OBL), Canada blue-joint (*Calamagrostis canadensis*, OBL), and reedcanary grass (*Phalaris arundinacea*, FACW).

TABLE 1
Perch Lake Wetland Resources

Wetland Name	Type within AOI	Approximate Size in AOI (ac)
Wetland 1	Shallow marsh, shrub-carr, wooded swamp	11.22
Wetland 2	Shallow marsh, shrub-carr	1.44

Shallow marsh, shrub-carr and wooded swamp wetlands cited herein are based on the descriptions and key in Eggers and Reed (1997, 2011). Table 2 compares these plant communities with the classification systems Cowardin *et al*. (1979) and Circular 39, used for Wetland Conservation Act purposes.

TABLE 2
Comparison of Wetland Classification Systems

Eggers and Reed (1997, 2011)	Cowardin et al. (1979)	Circular 39
Shallow Marsh	Palustrine; emergent; persistent and nonpersistent	Type 3: Inland shallow fresh marsh
Shrub Carr	Palustrine; scrub-shrub; broad-leaved deciduous	Type 6: Shrub swamp
Hardwood Swamp	Palustrine; forested; broad-leaved deciduous	Type 7: Wooded swamp

7. Conclusion.
Based on the procedures described above, a preponderance of evidence demonstrates the extent of wetland areas within the Perch Lake St. Louis River RAP project area, as shown on Figures 1a and 1b in Appendix A.

Corps of Engineers, St. Paul District Regulatory Branch Team for Perch Lake delineation:

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Leslie Day, Senior Ecologist/District Bank Coordinator
Paul Hauser, Project Manager

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Woodward, D. ed. 1997. *Hydrology Tools for Wetland Determination*. Chapter 19, Engineering Field Handbook. USDA, Natural Resources Conservation Service. Fort Worth, TX. 34 pp.

Appendix A

Figures

- **Figure 1 – Perch Lake Location**
- **Figure 1a – Perch Lake Area of Investigation**
- **Figure 1b – Perch Lake Wetlands**
- **Figure 2 – Perch Lake Soils**
- **Figure 3 – Perch Lake NWI**

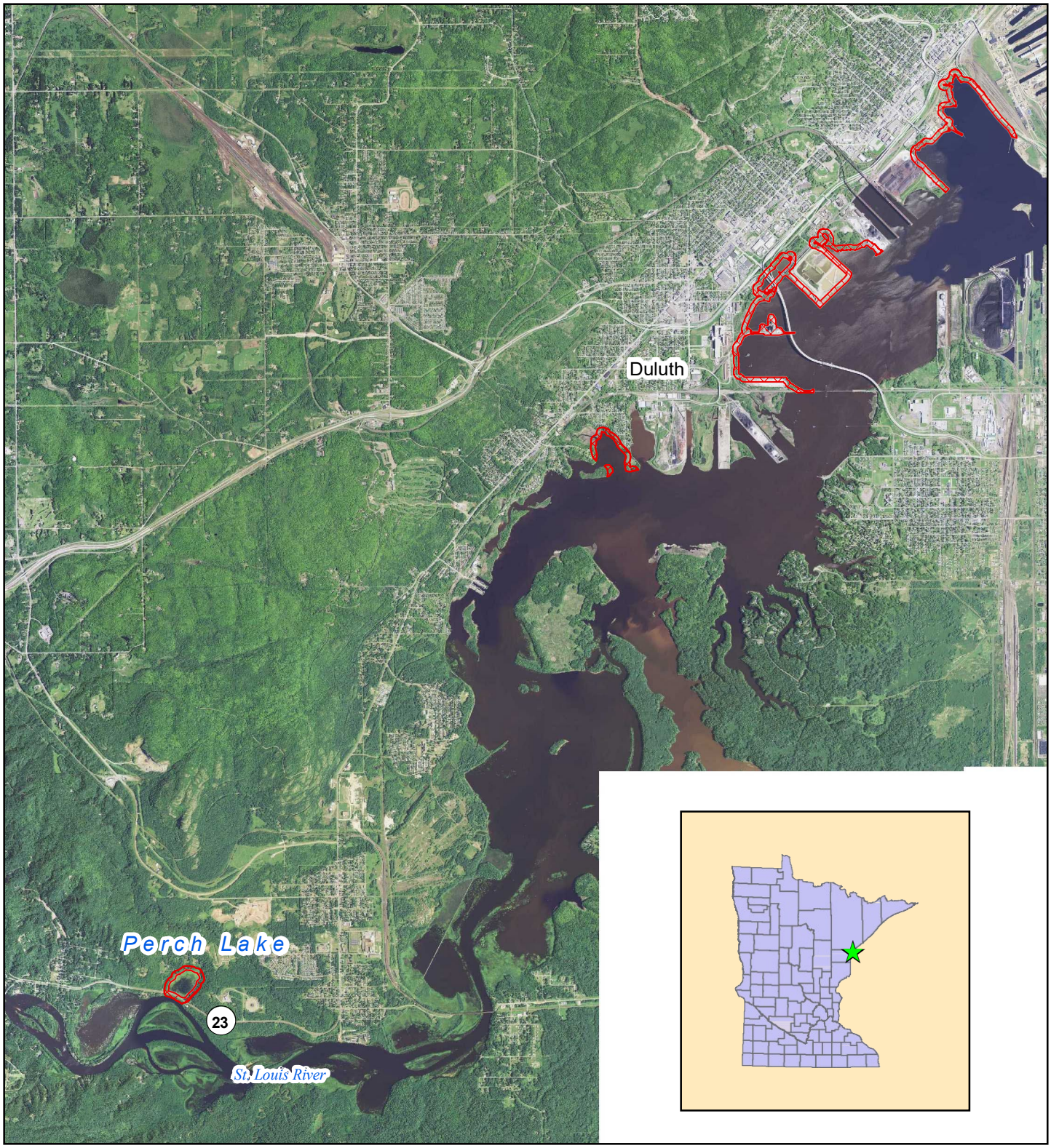


Figure 1 - Perch Lake Location

St. Paul District
Regulatory Branch

US Army Corps
of Engineers

N
W E
S

RAP Area of Investigation

0 2,200 4,400 8,800 13,200 17,600
Feet

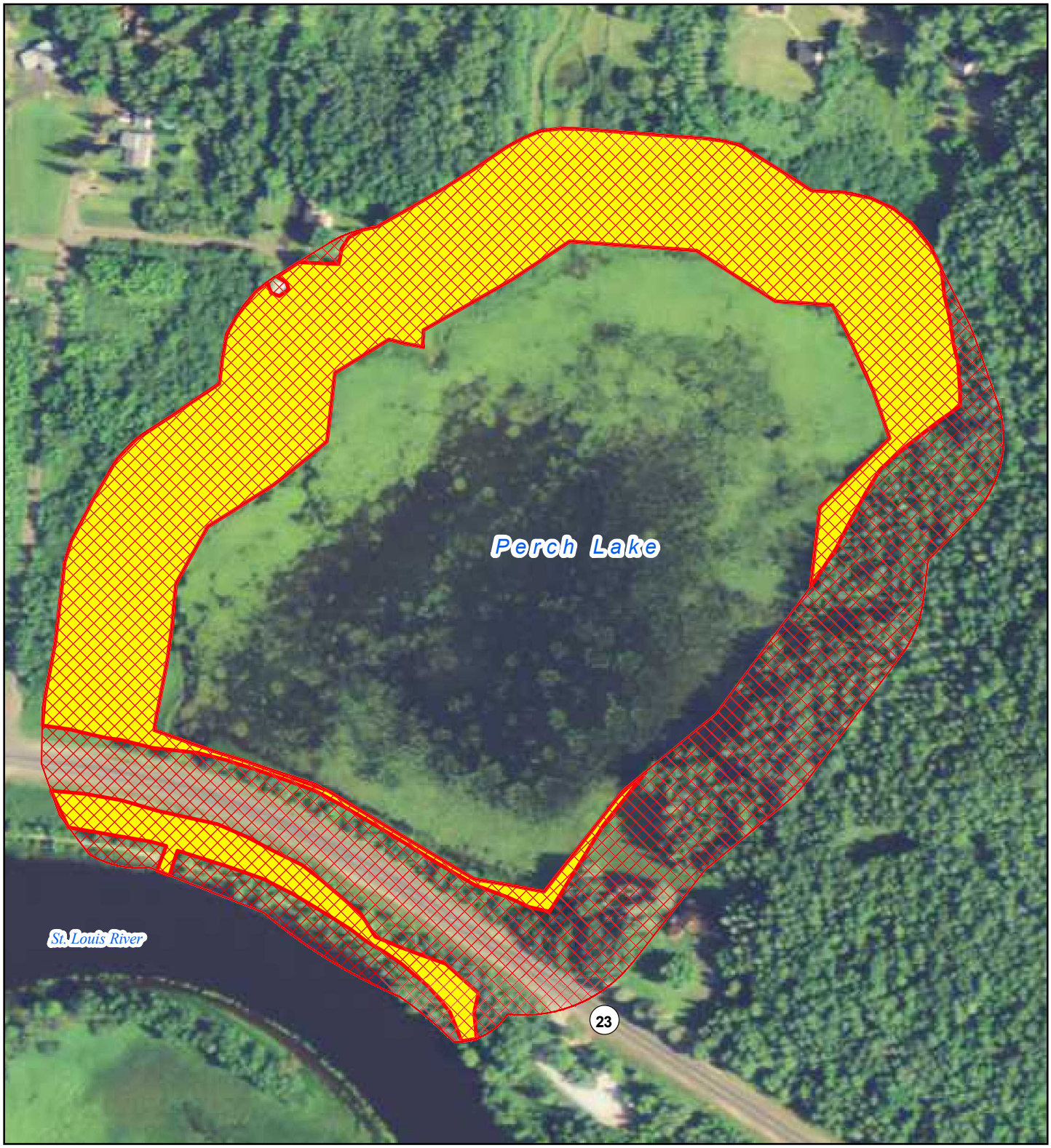


Figure 1a - Perch Lake Area of Investigation

St. Paul District
Regulatory Branch
US Army Corps
of Engineers

N
W E
S

RAP Area of Investigation
Wetlands

0 90 180 360 540 720
Feet

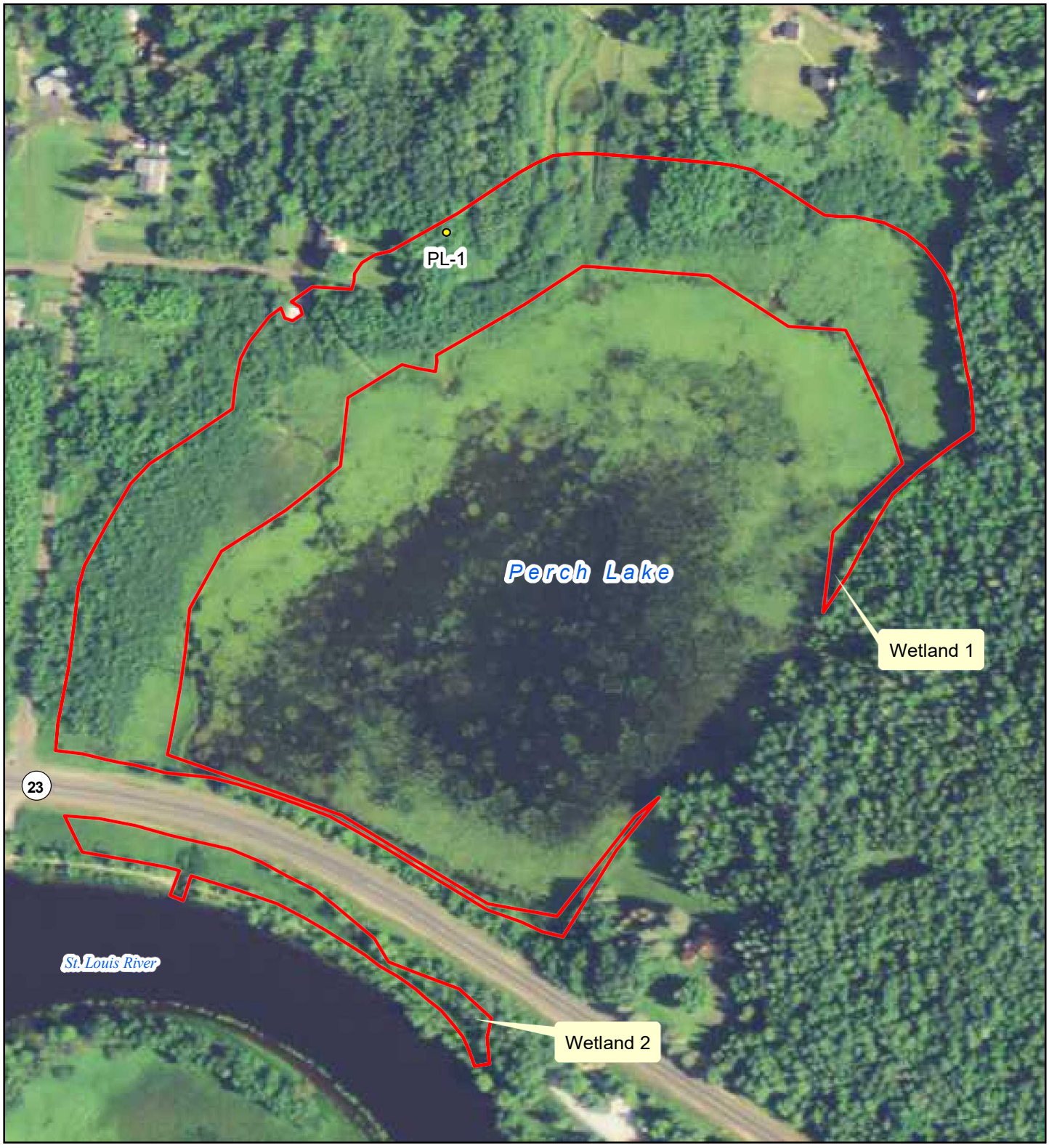


Figure 1b - Perch Lake Wetlands

St. Paul District
Regulatory Branch
US Army Corps
of Engineers

N
W E
S

Wetlands in AOI
Perch Lake Data Point

0 90 180 360 540 720
Feet

Figure 2 - Perch Lake Soils

St. Paul District
Regulatory Branch
US Army Corps
of Engineers

N
W E
S

0 62.5125 250 375 500
Feet

Area of Investigation

St Louis County Soils

Partially Hydric

Not Hydric

All Hydric

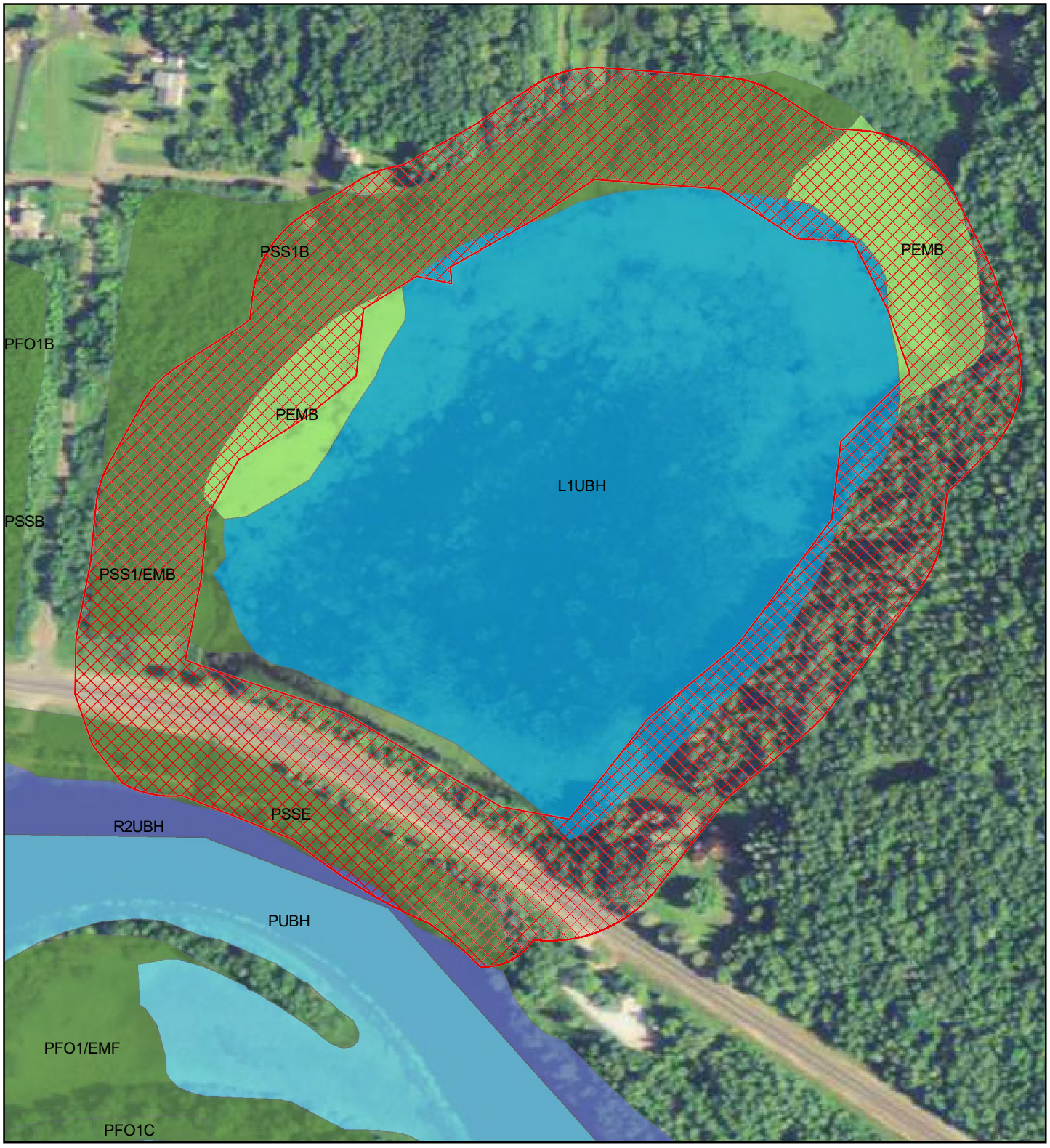


Figure 3 - Perch Lake NWI

St. Paul District
Regulatory Branch

US Army Corps
of Engineers

N
W E
S

Area of Investigation

0 62.5125 250 375 500
Feet

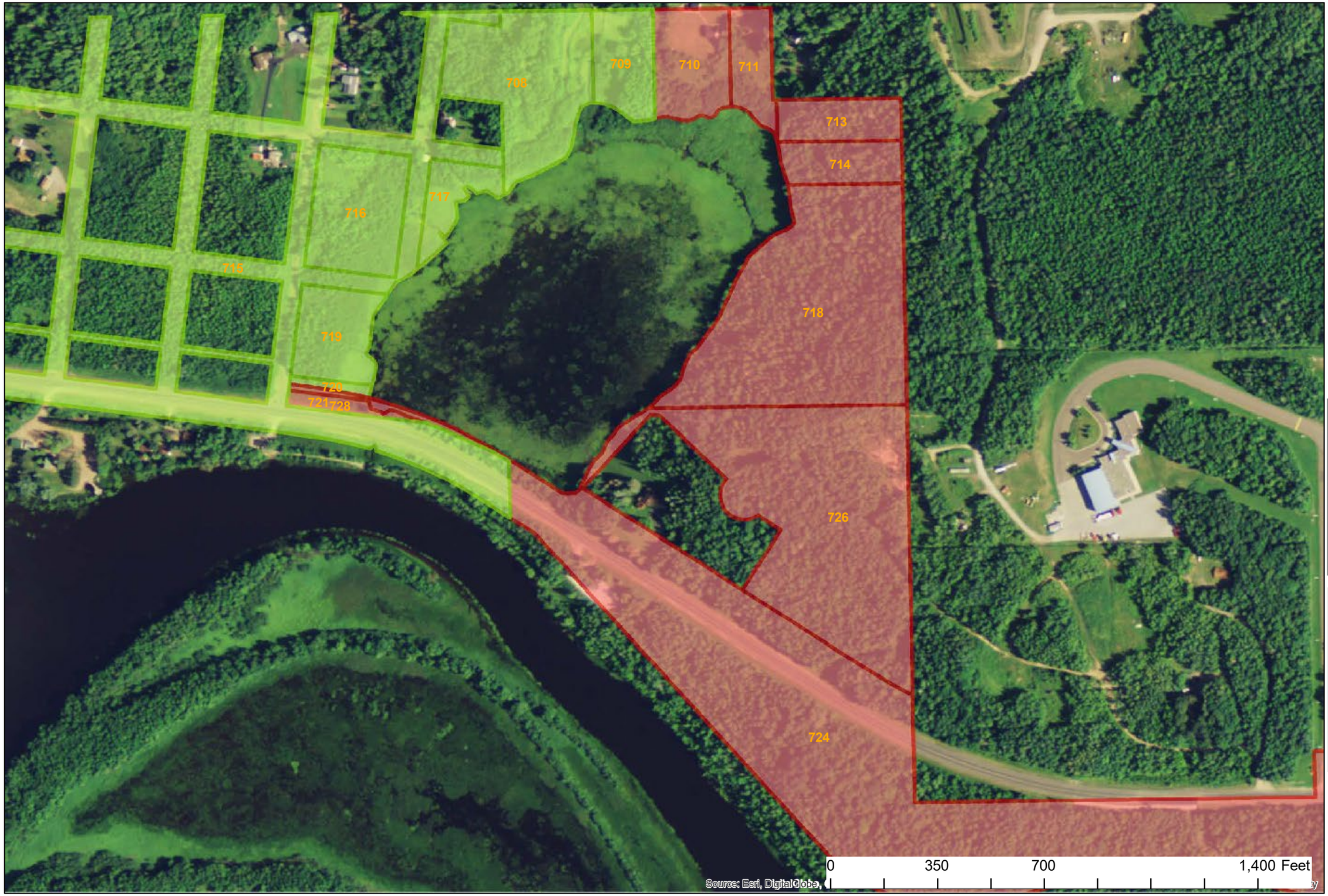
Appendix B

October 14, 2015 Site Visit Documentation

- **Exhibit "A" – Rights of Entry accessible areas**
- **Data sheet**
- **Antecedent precipitation**

RAP St Louis River Parcels

U.S. Army Corps of Engineers
Detroit District



Legend

Site_ID

- Signed ROE
- No Access

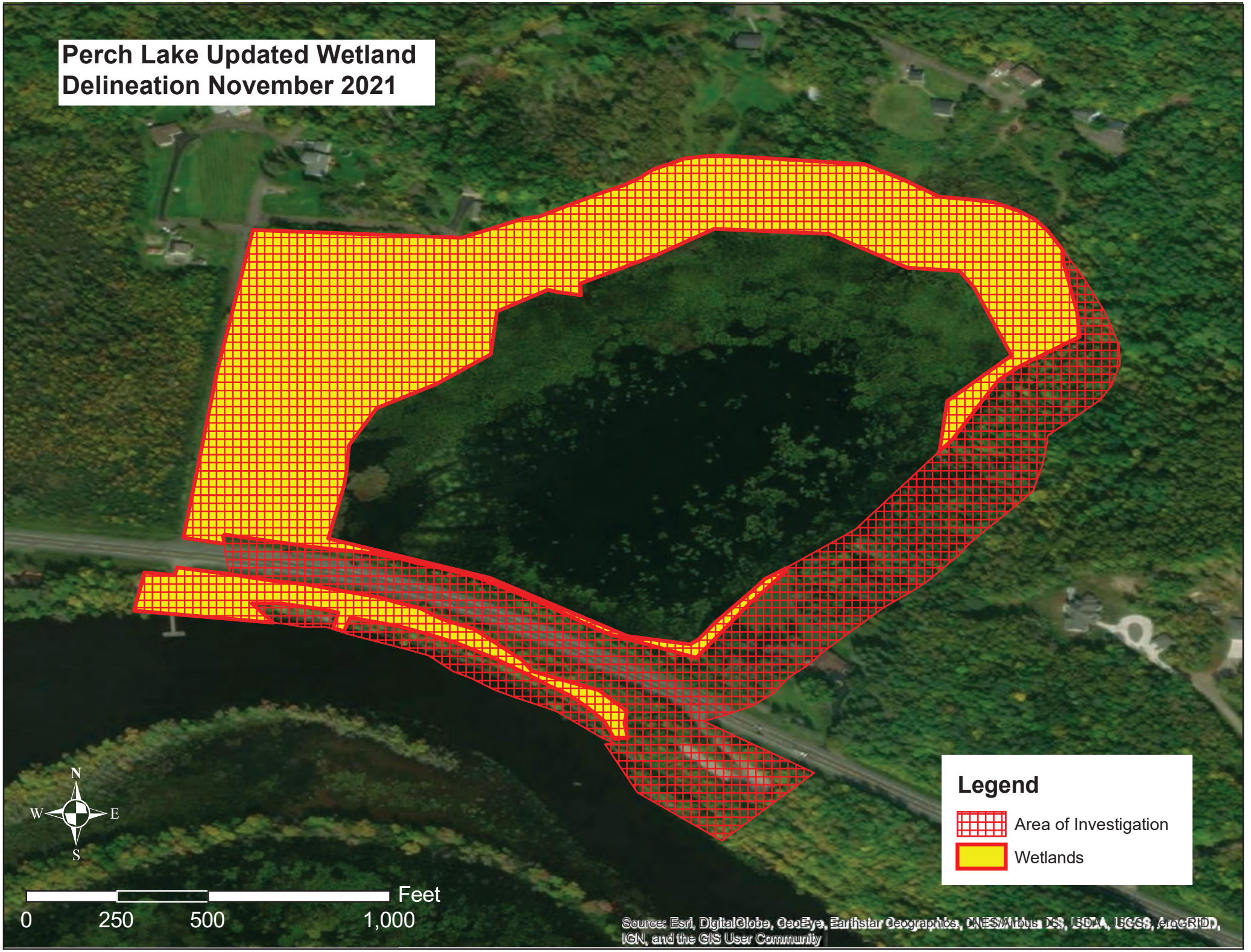
Location Map

N
W E
S

Site - 6
Exhibit "A"
DACW35-9-15-____

Wetland delineation report appendices (Wetland Determination Data Forms and Climate Summary Data) available upon request.

Updated delineation boundaries based on 2021 field visit


Perch Lake Updated Wetland Delineation November 2021
N
W
E
S
Feet
0
250
500
1,000
Legend
Area of Investigation
Wetlands
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community