

AOC Potential Wetland Assessment 2013



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St. Clair Region Conservation Authority
04/28/2014

Introduction

The St. Clair Region Conservation Authority (SCRCA) currently obtains wetland mapping from the Ontario Ministry of Natural Resources (OMNR). As users of OMNR's wetland layer for land use planning and Generic Regulation enforcement, the SCRCA and neighboring Conservation Authorities have determined that OMNR's wetlands do not represent all the wetlands on the landscape. There are many pockets of wetland communities, some small, some moderate in size that have not been previously mapped. SCRCA adapted Upper Thames River Conservation Authority (UTRCA) and Ausable Bayfield Conservation Authority (ABCA) desktop wetland identification methodologies to suit the data available. This mapping resulted in significant increases in wetland area over existing OMNR mapping. In the future, if funding allows, field verification can enhance and refine the identified areas.

Two methods were used to identify areas of potential wetland cover. The first method was adapted from the UTRCA/ABCA and consists of two stages. Firstly the potential wetland areas were generated by merging various indicators/layers on the GIS. The second step was to interpret these areas on the 2010 ortho- imagery for the likeliness that wetland cover exists.

The water storage capacity of a wetland is affected by the soil, the groundwater level and the surface contour. Wetlands generally occur in natural depressions in the landscape where geologic or soil layers restrict drainage. The surface contours act to collect precipitation and runoff water and feed it to the depressed area. The SCRCA is lacking detailed digital elevation data across the watershed therefore at this time, elevation models will not be used to assess potential wetland areas. The wetland mapping indications used were; Forest Cover, Soil Type and Groundwater.

The second method was based exclusively on orthophotography interpretation skills, identifying areas characteristic of wetland cover. The dominant wetland type in the SCRCA watershed is swamps, which tend to have:

- Darker tones (e.g. standing water absorbs light)
- Less dense/more open canopy cover (e.g. trees spaced more widely or irregularly)
- Fluffier canopy tops due to a denser branching form that conceals the trunk of the tree; this is in contrast to sugar maples which have a translucent appearance so trunks can be seen through their canopies

This report summarizes the area of potential wetland within the AOC, identified through the two methods referenced above. The report contains tabular summaries and mapping for each subwatershed.

Methodology

GIS Methodology

The wetland assessment is based on suitable soil type, woodland cover and groundwater discharge. This data was intersected in the GIS to identify potential wetland areas and then visually inspected using the 2010 SWOOP ortho-photography. The resultant layer represents those areas where each of the above wetland indicators overlay and was confirmed to have a high likeliness that wetland cover exists through air photo interpretation (SWOOP 2010).

The data used was:

Woodland Cover - 1983 Agricultural Landuse

Woodlands can often contain wetted areas, or swamps, which may have been overlooked by historical field checks, and are now easier to discern with precision imagery. Swamps are the dominant wetland type in the SCRCA watershed. The layer used was from the 1983 agricultural landuse inventory

conducted by the Ministry of Agriculture. This layer contains a multitude of landuse classes, of which woodlands and swamps /marsh/bog were used for this analysis.

Soils

Wetlands exist in areas where the soil is saturated for most of the year. Identifying areas of organic soil or imperfectly drained soils can assist in identifying wetland potential areas. Organic soils are the best indicator of a where a wetland is likely to occur. Imperfectly drained soils (clay and clay composites) retain water longer and thus contribute to wetland function. The soil types used or this analysis were: Organic, silt and clay, silt and clay loads, sand and bottom land.

Groundwater

Wetlands are impacted by the hydrologic conditions under the ground. Areas where groundwater is close to the surface (perched water tables or discharge areas) will generally support wetland characteristics. Using groundwater data for the SCRCA watershed, groundwater discharge areas were removed and used for this analysis.

Air Photo Interpretation (Exclusively)

Using the ortho-photography of the SCRCA watershed (SWOOP 2010), each woodlot and surrounding area was examined, using air photo interpretation skills. The ortho-imagery was flown in May 2010, before the leaves are on the trees, allowing the ground to be seen. The early spring photos exhibit typical wet conditions and water storage patterns, aiding in the identification of swamps in the watershed.

Results

GIS Methodology

There was only one sub watershed, Perch Creek that was identified to have potential wetland areas, determined through GIS. Map 1 illustrates the potential wetlands identified as well as their proximity to the existing MNR wetlands. Being in close proximity to an already identified MNR wetland is a good indicator that the area may support wetland characteristics. Table 1 shows the resultant area in km² that was identified as potential wetland.

Air Photo Interpretation (Exclusively)

All subwatersheds in the AOC except Running Creek and Bowens Creek were identified as having potential wetlands areas through interpretation of the 2010 spring ortho image. Maps 2 – 12 illustrate those areas. All areas identified do not overlap existing MNR, stewardship or ELC recognized wetlands. Table 1 displays the values in km². Table 2 is a summary table of all sources of wetlands including MNR, stewardship, ELC and potential wetlands mapped in the AOC.

Table 1 Summary Table of Potential Wetlands





Subwatershed	Area	Potential Wetland determined through GIS (km2)	Potential Wetland determined through air photo interpretation (km2)
Area 1-B	288.9	0	2.17
Baby Creek	21	0	0.08
Bowens Creek	6.6	0	0.00
Clay Creek	56.7	0	0.42
Maxwell /Rankin /Bear	55.4	0	0.02
Mckeough	21.7	0	0.45
Perch	77.2	0.007	0.52
Point Edward & Sarnia	29.6	0	0.002
Running Creek / Lower Sydenham	48.8	0	0.00
St. Clair Direct Drainage	44.3	0	0.18
Talford creek	57.2	0	0.50
Walpole Island	145.9	0	1.02
Whitebread/Marshy	43.7	0	0.09
Total Area	897.0	0.007	5.45

Table 2 Summary Table of all Sources of Wetlands mapped in the AOC

Subwatershed	Area (km2)	MNR wetland Area (km ²)	ELC wetland area (km2)	Stewardship Wetland Area (km2) *	Potential Wetland determined through GIS (km2)	Potential Wetland determined through air photo interpretation (km2)	Total Wetland Area (km2) All sources	Subwatershed Area as a % Total Wetland (MNR, ELC Stewardship and potential)
Area 1-B	288.9	0.95	0	0.18	0	2.17	3.300	1.14
Baby Creek	21	0	0	0	0	0.08	0.080	0.38
Bowens Creek	6.6	0.6	0	0.11	0	0.00	0.710	10.76
Clay Creek	56.7	2.52	0	0.18	0	0.42	3.120	5.50
Maxwell /Rankin /Bear	55.4	2.82	1.41	0.41	0	0.02	4.660	8.41
Mckeough	21.7	0.06	0	0.01	0	0.45	0.520	2.40
Perch	77.2	0.59	0	0	0.007	0.52	1.117	1.45
Point Edward & Sarnia	29.6	0	0.006	0	0	0.002	0.008	0.03
Running Creek / Lower Sydenham	48.8	0.54	0.29	0.06	0	0.00	0.890	1.82
St. Clair Direct Drainage	44.3	0.79	0.18	0.03	0	0.18	1.180	2.66
Talford creek	57.2	0	0	0.004	0	0.50	0.504	0.88
Walpole Island	145.9	0	63.56	0	0	1.02	64.580	44.26
Whitebread/Marshy	43.7	0.03	0.08	0.003	0	0.09	0.203	0.46
Total Area	897.0	8.9	65.526	0.987	0.007	5.45	80.872	

Potential Wetlands Identified through GIS Perch Creek

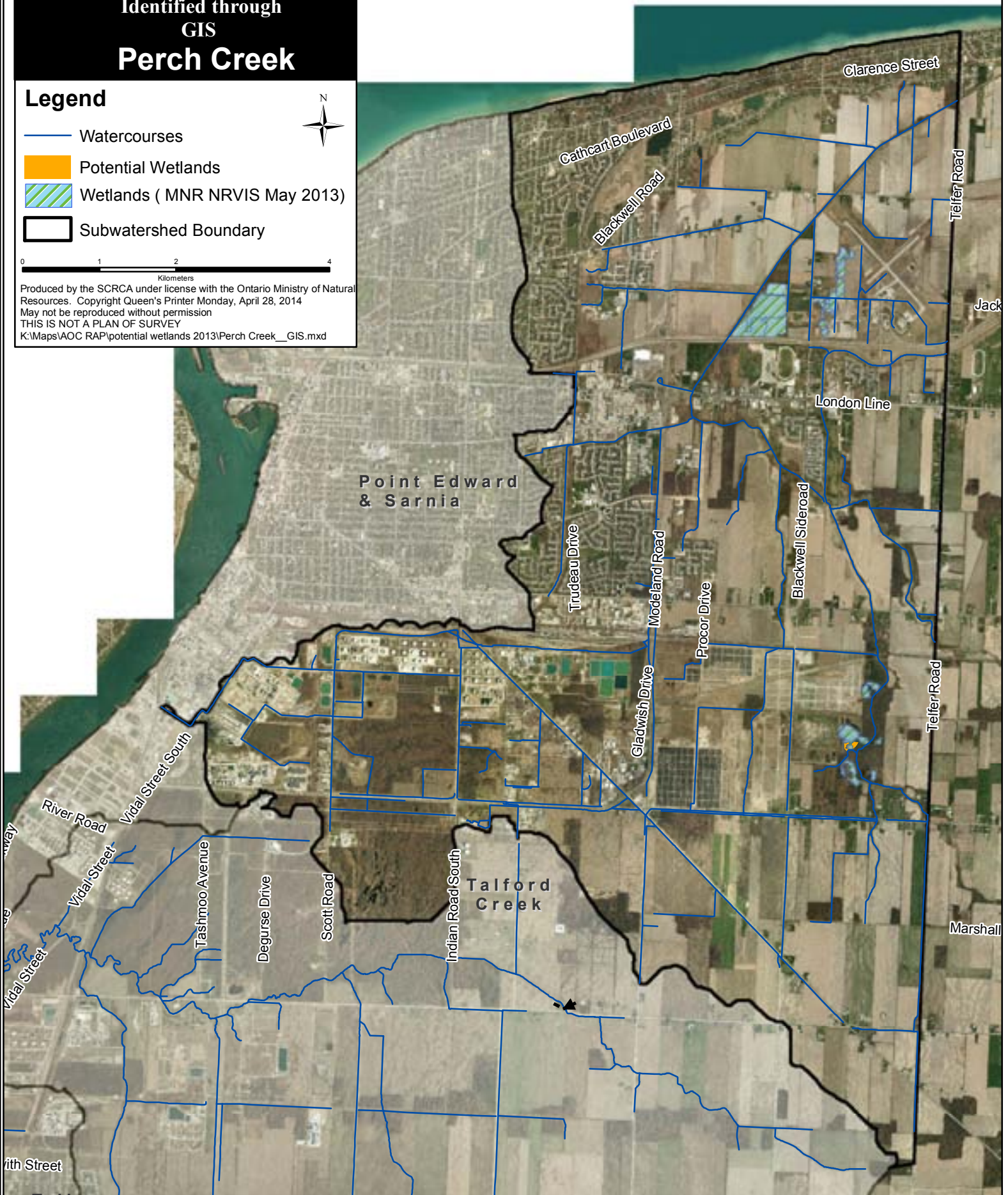
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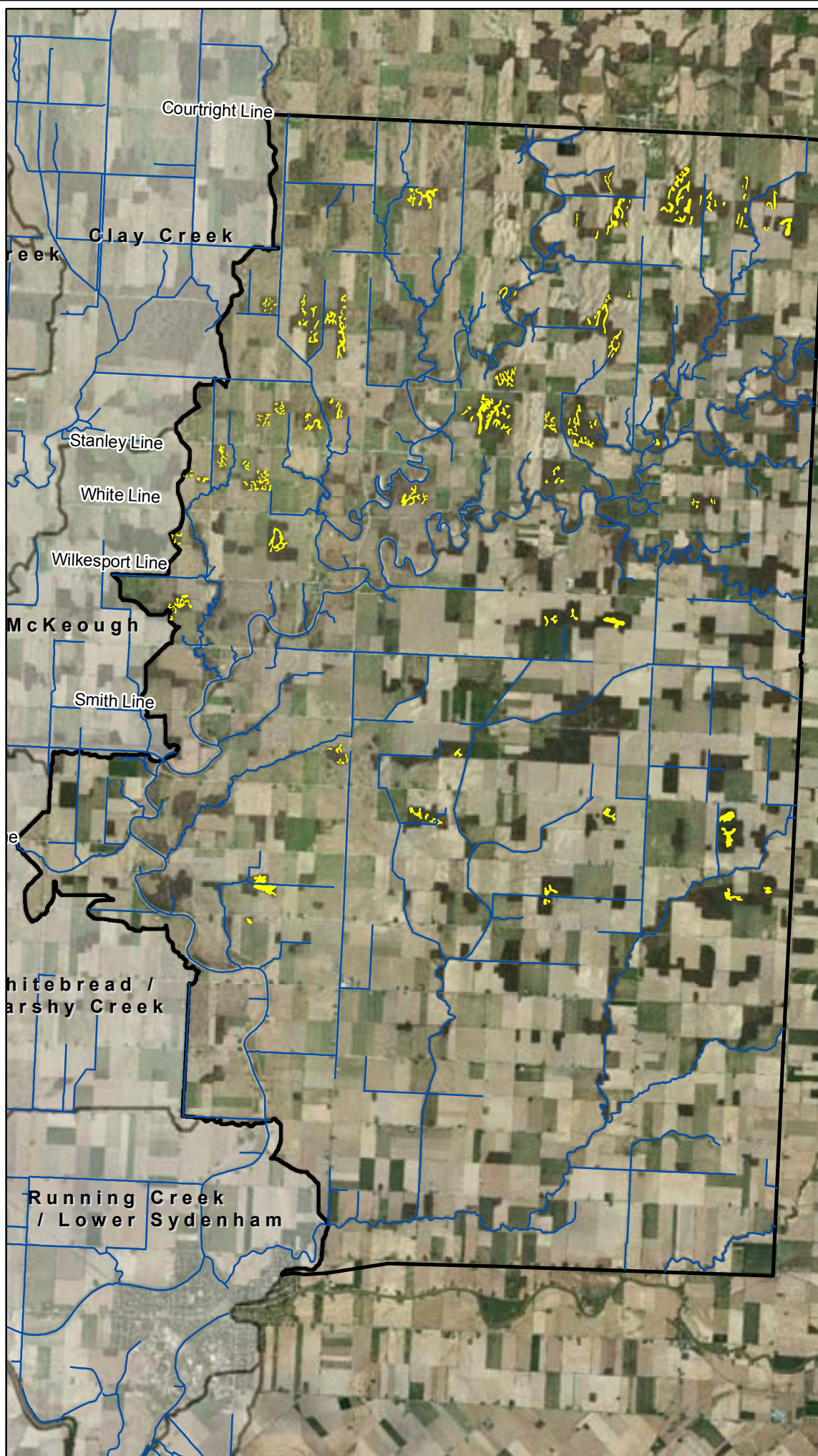
-  Watercourses
-  Potential Wetlands
-  Wetlands (MNR NRVIS May 2013)
-  Subwatershed Boundary



0 1 2 4
Kilometers

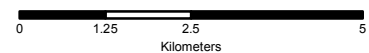
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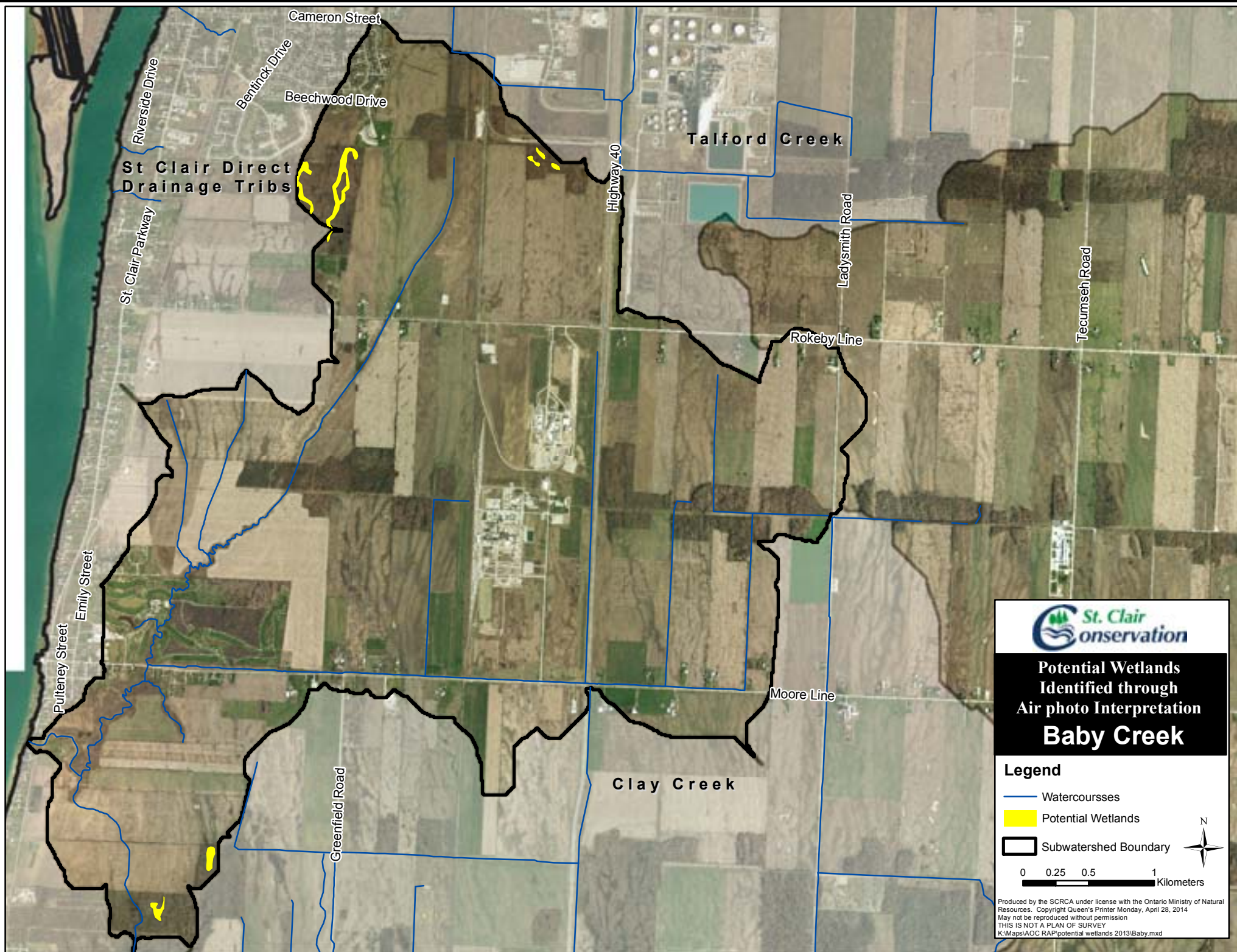


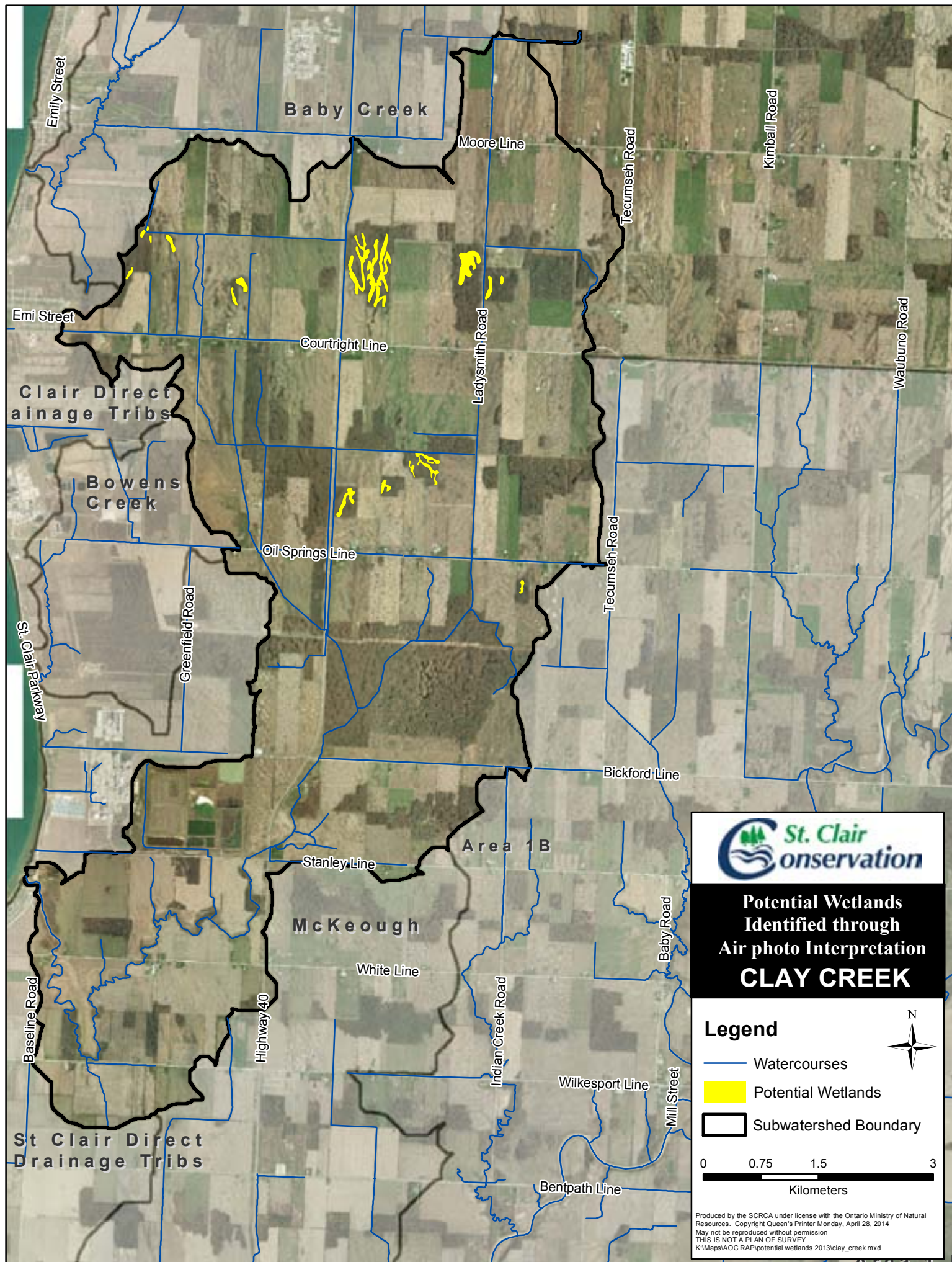
Potential Wetlands
Identified through
Air photo Interpretation
AREA 1-B

- Legend**
- Watercourses
 - Potential Wetlands
 - Subwatershed Boundary



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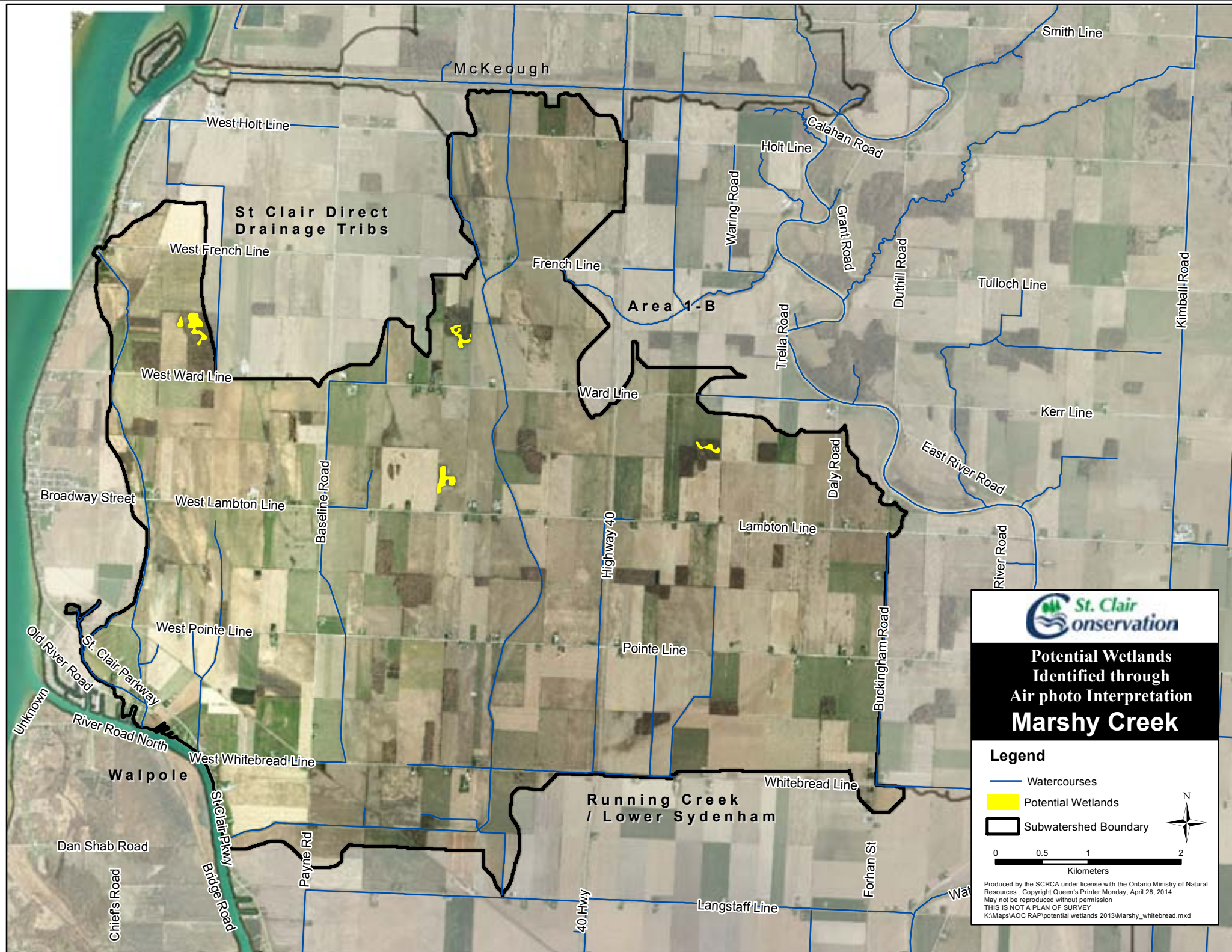
Potential Wetlands
Identified through
Air photo Interpretation
CLAY CREEK

Legend

- Watercourses
- Potential Wetlands
- Subwatershed Boundary

0 0.75 1.5 3
Kilometers

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**St Clair Direct
Drainage Tribs**

Area 1-B

**Running Creek
/ Lower Sydenham**

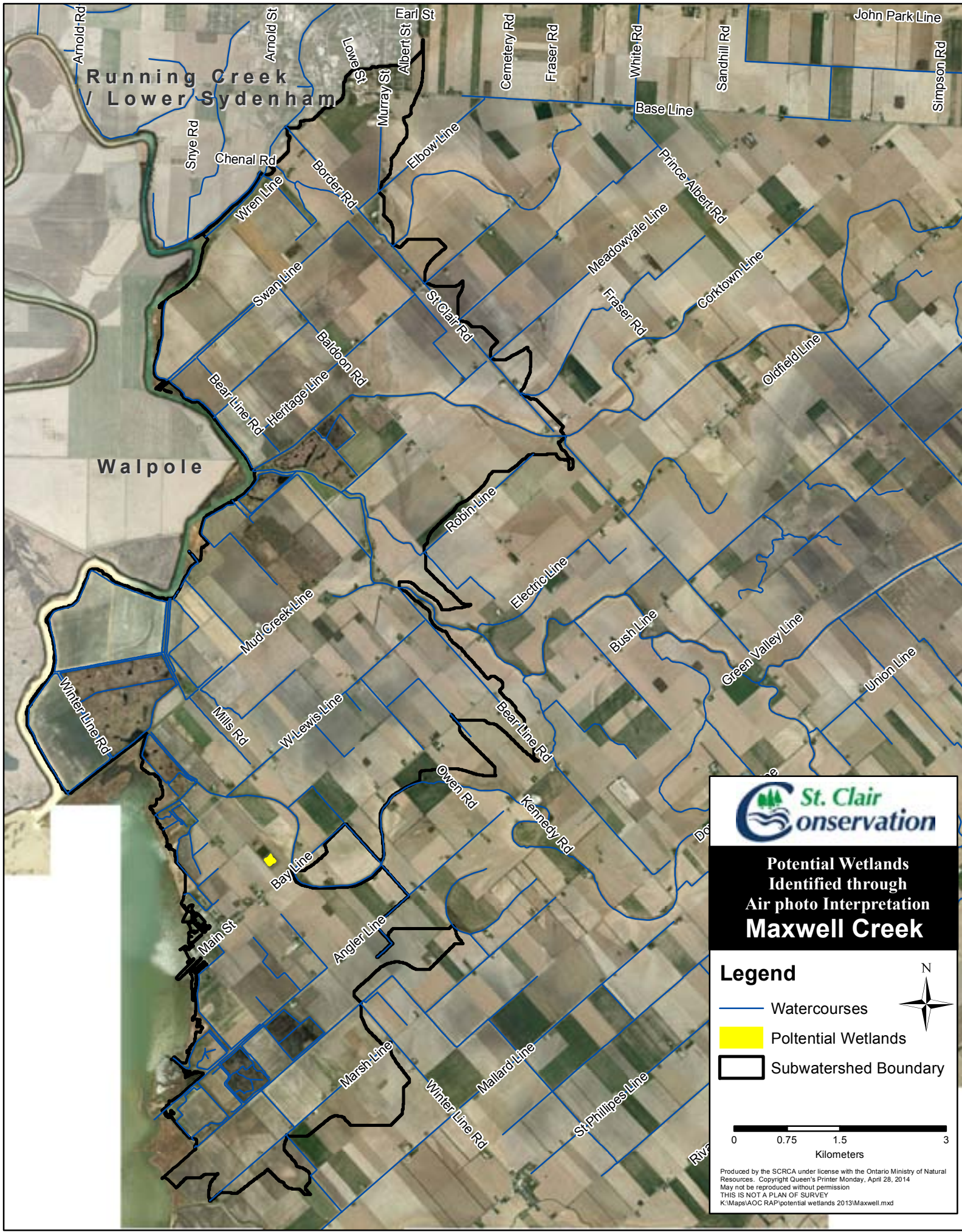


**Potential Wetlands
Identified through
Air photo Interpretation
Marshy Creek**

Legend

- Watercourses
 - Potential Wetlands
 - Subwatershed Boundary
- 0 0.5 1 2
Kilometers

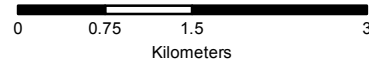
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Potential Wetlands
Identified through
Air photo Interpretation
Maxwell Creek

Legend




- Watercourses
- Potential Wetlands
- Subwatershed Boundary



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Potential Wetlands
Identified through
Air photo Interpretation
MCKEOUGH

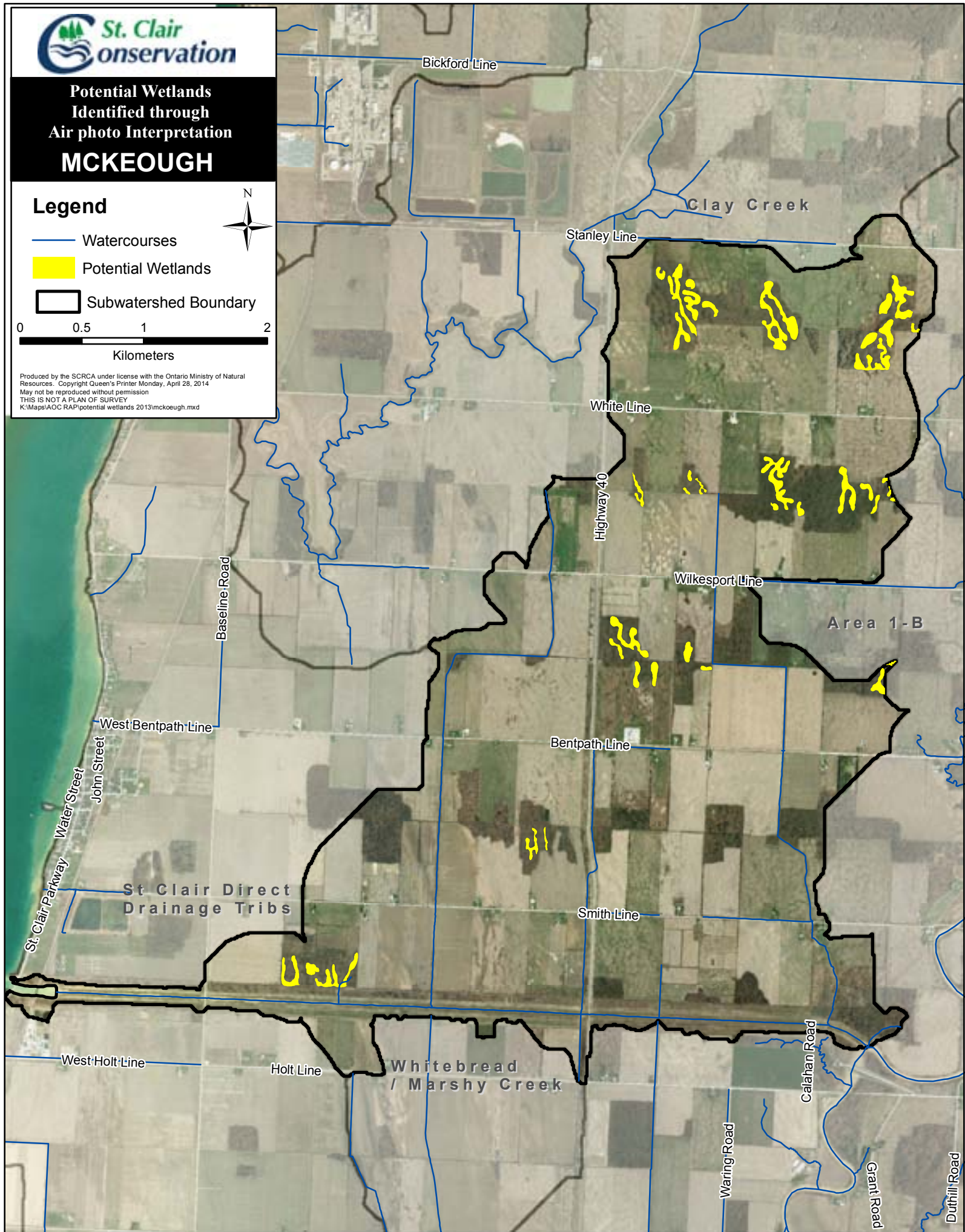
Legend

-  Watercourses
-  Potential Wetlands
-  Subwatershed Boundary






0 0.5 1 2
Kilometers

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**Potential Wetlands
Identified through
Air photo Interpretation
Perch Creek**

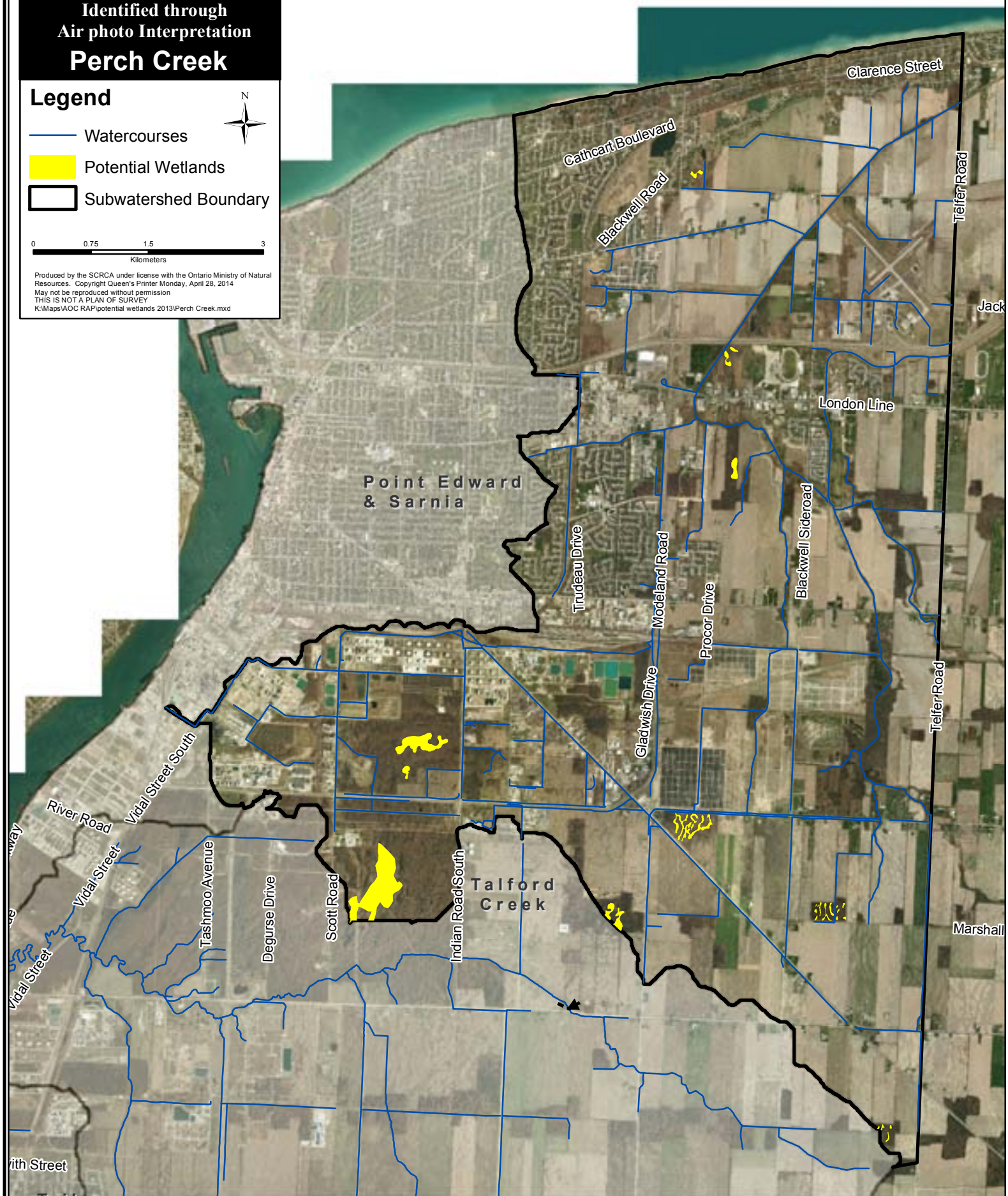
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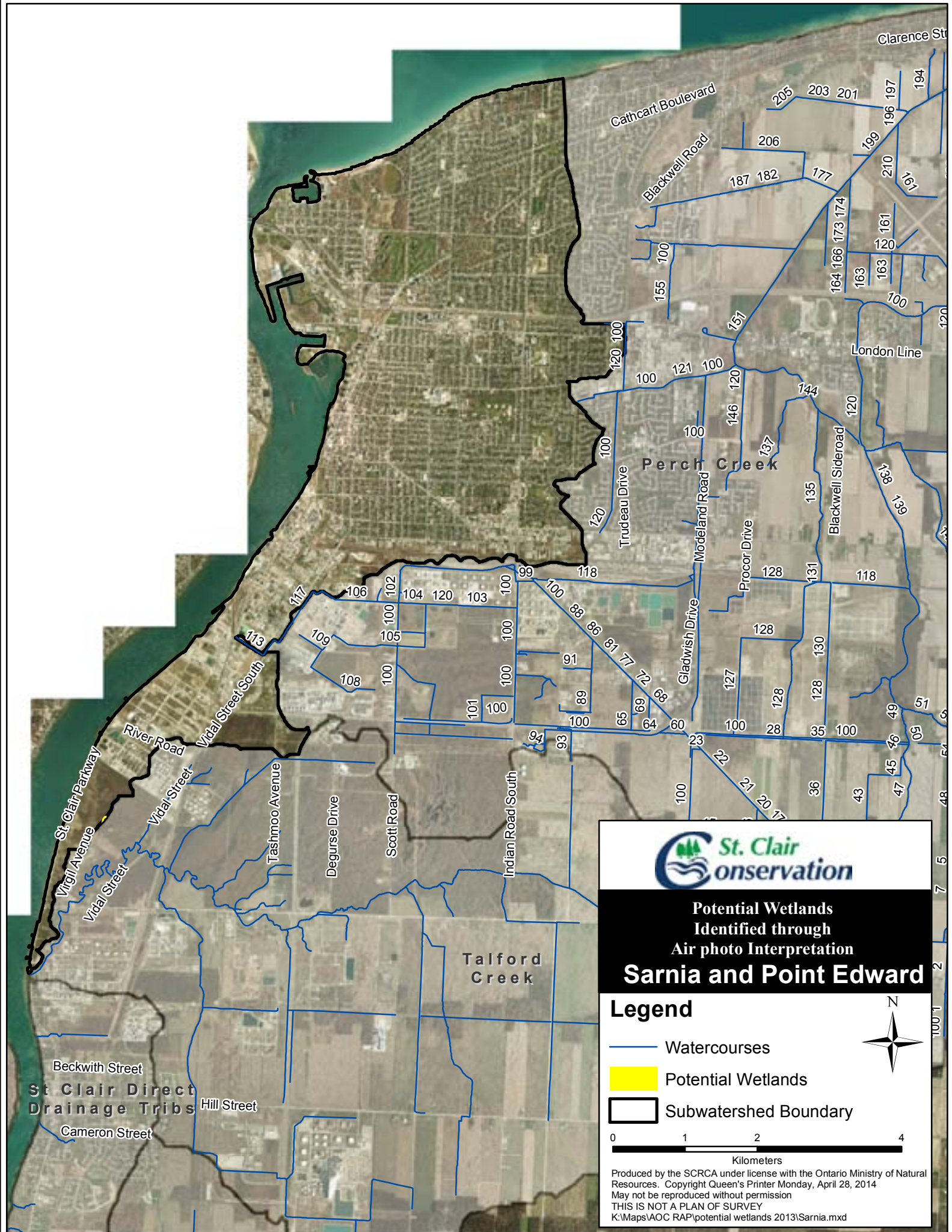
-  Watercourses
-  Potential Wetlands
-  Subwatershed Boundary



0 0.75 1.5 3
Kilometers

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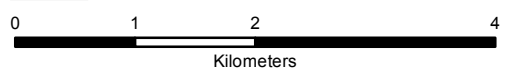




Potential Wetlands
Identified through
Air photo Interpretation
Sarnia and Point Edward

Legend




- Watercourses
- Potential Wetlands
- Subwatershed Boundary



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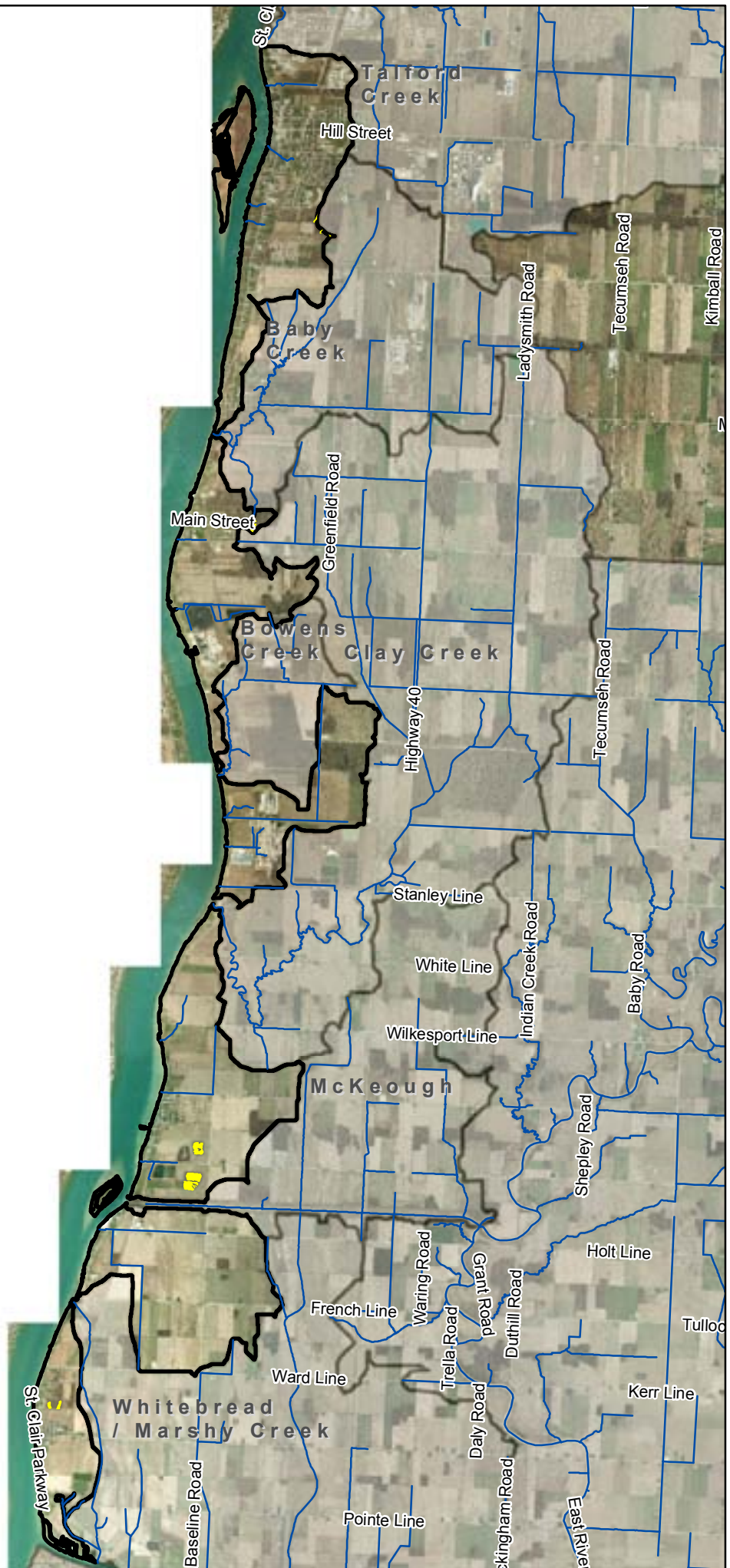
Potential Wetlands
Identified through
Air photo Interpretation
ST. CLAIR RIVER TRIBS

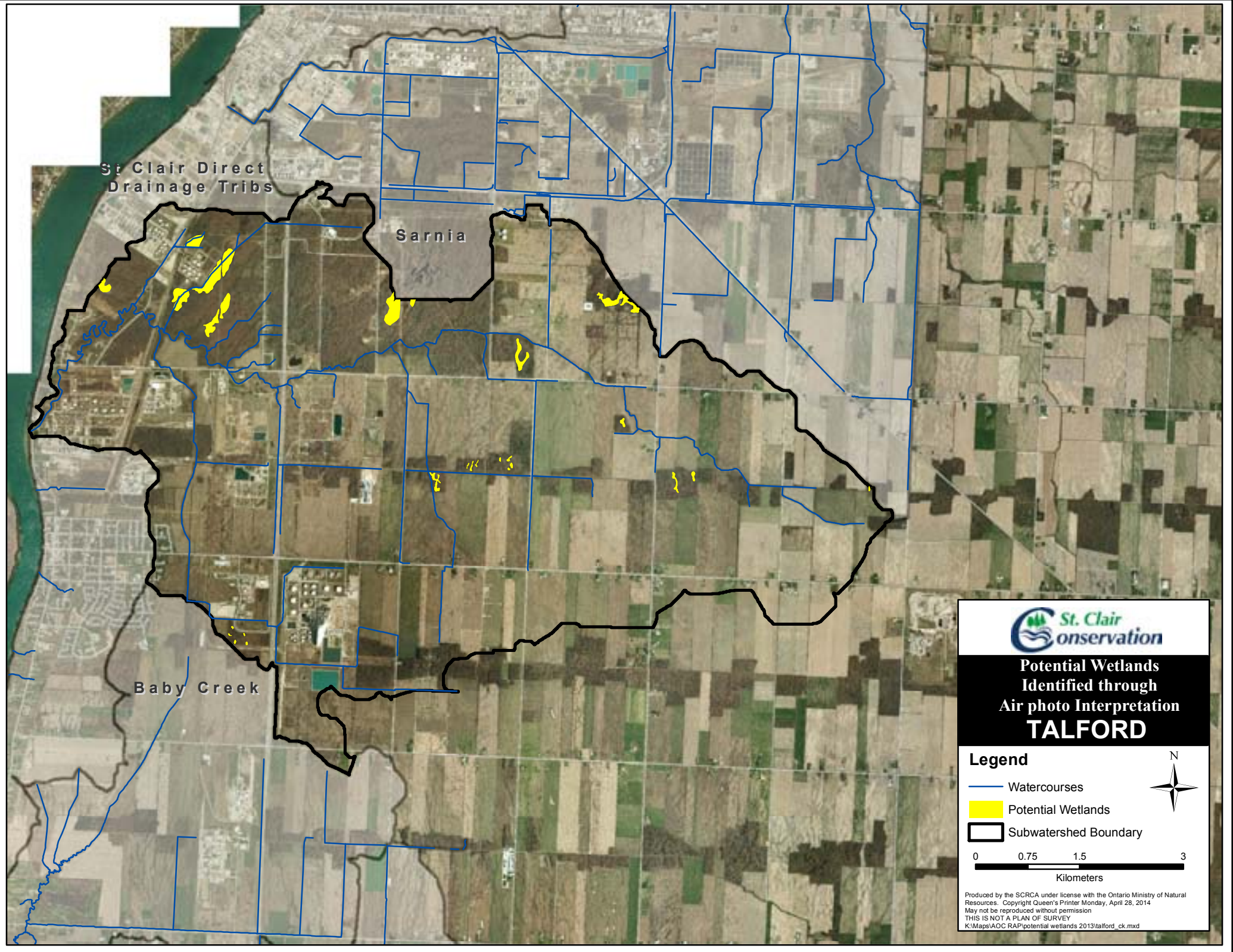
Legend

-  Watercourses
 -  Potential Wetlands
 -  Subwatershed Boundary
- 0 1.5 3 6
Kilometers



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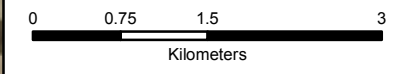




Potential Wetlands
Identified through
Air photo Interpretation
TALFORD

Legend




- Watercourses
- Potential Wetlands
- Subwatershed Boundary



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Potential Wetlands Identified through Air photo Interpretation WALPOLE ISLAND

Legend

-  Watercourses
-  Potential Wetlands
-  Subwatershed Boundary

0 1.75 3.5 7
Kilometers

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