APPLETON SHORES SUBDIVISION

Environmental Impact Statement

Prepared For:
Southwell Homes Ltd.
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Prepared By:
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Date:
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(Updated August 2022)

List of Acronyms and Definitions

ABBO - Atlas of Breeding Birds of Ontario
ANSI – Area of Natural and Scientific Interest
BHA - Butternut Health Assessments/Butternut Health Assessor
CC - Co-Efficient of Conservation
COSEWIC - Committee on the Status of Endangered Wildlife in Canada
DBH - Diameter at breast height
EIS – Environmental Impact Statement
ELC - Ecological Land Classification
ESA - Endangered Species Act (Provincial)
GPS – Global Positioning System
NAD 83: North American Datum 1983
UTM: Universal Transverse Mercator
LIO - Land Information Ontario
MMP - Marsh Monitoring Program
MVCA – Mississippi Valley Conservation Authority
NHIC – Natural Heritage Information Centre
NHRM - Natural Heritage Reference Manual
MBCA - Migratory Bird Convention Act (Federal)
MECP - Ministry of Environment, Conservation and Parks
MNRF - Ministry of Natural Resources and Forestry
NHIC – Natural Heritage Information Centre
NHRM - Natural Heritage Reference Manual
OMNR/MNRF - Ontario Ministry of Natural Resources (old name)
- Ministry of Natural Resources and Forestry (new name)
OP – Official Plan
OWES - Ontario Wetland Evaluation System
PSW - Provincially Significant Wetlands
SAR - Species at Risk (in this report they refer to species that are provincially or federally listed as endangered or threatened and receive protection under ESA or SARA)
SARA - Species at Risk Act (Federal)
SARO - Species at Risk in Ontario
SWHCS - Significant Wildlife Habitat Criteria Schedules
SWHTG - Significant Wildlife Habitat Technical Guide
SWH - Significant Wildlife Habitat

SRANK DEFINITIONS

S1 Critically Imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially

vulnerable to extirpation from the state/province.
S2 Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 Apparently Secure; uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure; Common, widespread, and abundant in the nation or state/province.
? Inexact Numeric Rank—Denotes inexact numeric rank
SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#B Breeding
S#N Non-Breeding

SARA STATUS DEFINITIONS
END Endangered: a wildlife species facing imminent extirpation or extinction.
THR Threatened: a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC Special Concern, a wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

SARO STATUS DEFINITIONS
END Endangered: A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's ESA.
THR Threatened: A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC Special concern: A species with characteristics that make it sensitive to human activities or natural events.

Coefficient of Conservatism Ranking Criteria
0 Obligate to ruderal areas.
1 Occurs more frequently in ruderal areas than natural areas.
2 Facultative to ruderal and natural areas.
3 Occurs less frequent in ruderal areas than natural areas.
4 Occurs much more frequently in natural areas than ruderal areas.
5 Obligate to natural areas (quality of area is low).
6 Weak affinity to high-quality natural areas.
7 Moderate affinity to high-quality natural areas.

8 High affinity to high-quality natural areas.
9 Very high affinity to high-quality natural areas.
10 Obligate to high-quality natural areas.

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1.0 INTRODUCTION

Bowfin Environmental Consulting Inc. (Bowfin) was retained by Southwell Homes, hereafter referred to as the proponent, in 2021 to update an Environmental Impact Statement (EIS) for this property. The EIS was originally prepared in 2015 and previously updated in 2017 on behalf of the previous owner. In 2022, Bowfin transferred its professional services to CIMA+.

The property is situated in Part of Lot 4 Concession 10 in the Geographic Township of Ramsay, Town of Mississippi Mills, County of Lanark. The lands include approximately 7 hectares and are bordered by the Mississippi River to the north, Appleton Provincially Significant Wetland to the west and north, and residential units along Apple Street and Old Mill Lane to the east and south (Figure 1). The site is the location of the former old wooden mill and its associated sewage lagoons. The lagoons have been backfilled, all buildings removed, and the site has started naturalizing with herbaceous species. The proponent wishes to redevelop these lands into single detached units with private services. As per the Official Plan (OP) of the County of Lanark and the Municipality of Mississippi Mills Community OP, an EIS is required prior to the approval. The purpose of an EIS is to assess the negative impacts on the natural features and ecological functions of the area in question. The OP follows the guidelines set out in the Provincial Policy Statement (PPS) in which there are several natural features and areas identified as needing protection. These are:

- Significant habitat of Endangered and Threatened Species (SAR);
- Significant wetlands;
- Significant coastal wetlands or coastal wetlands;
- Significant valleylands;
- Significant woodlands;
- Significant wildlife habitat;
- Significant Areas of Natural and Scientific Interest; and
- Fish habitat.

The Site is within the Municipality of Mississippi Mills Community Official Plan which identifies the natural constraints on Schedule A, except for significant wildlife habitat and habitat of Endangered and Threatened species. It is also within Lanark County. Lanark County also designates all significant natural features on Schedule A of the OP with the exception of habitat of Endangered and Threatened Species for which site-specific studies are required.

The original EIS has been updated to capture any changes to environmental acts and regulations including any updates to the applicable OP and its schedules to determine if significant natural features have been designated within or adjacent to the site and an evaluation of the presence/absence of habitat of Endangered and Threatened species. Where identified, the

boundaries of any significant features are noted and the potential for the proposed land development to cause negative impacts is assessed and avoidance and mitigation measures provided.

Figure 1: General Location of Site

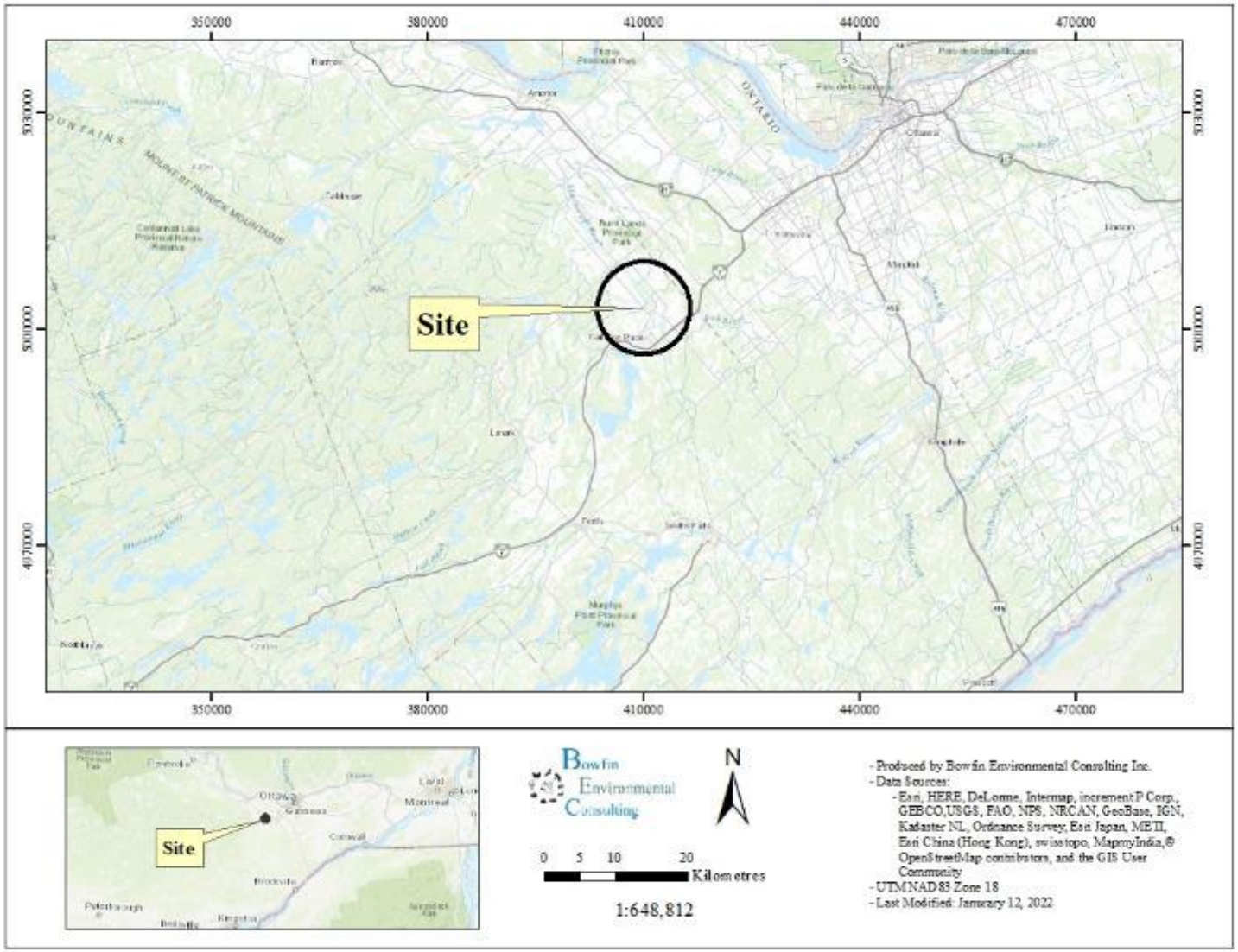
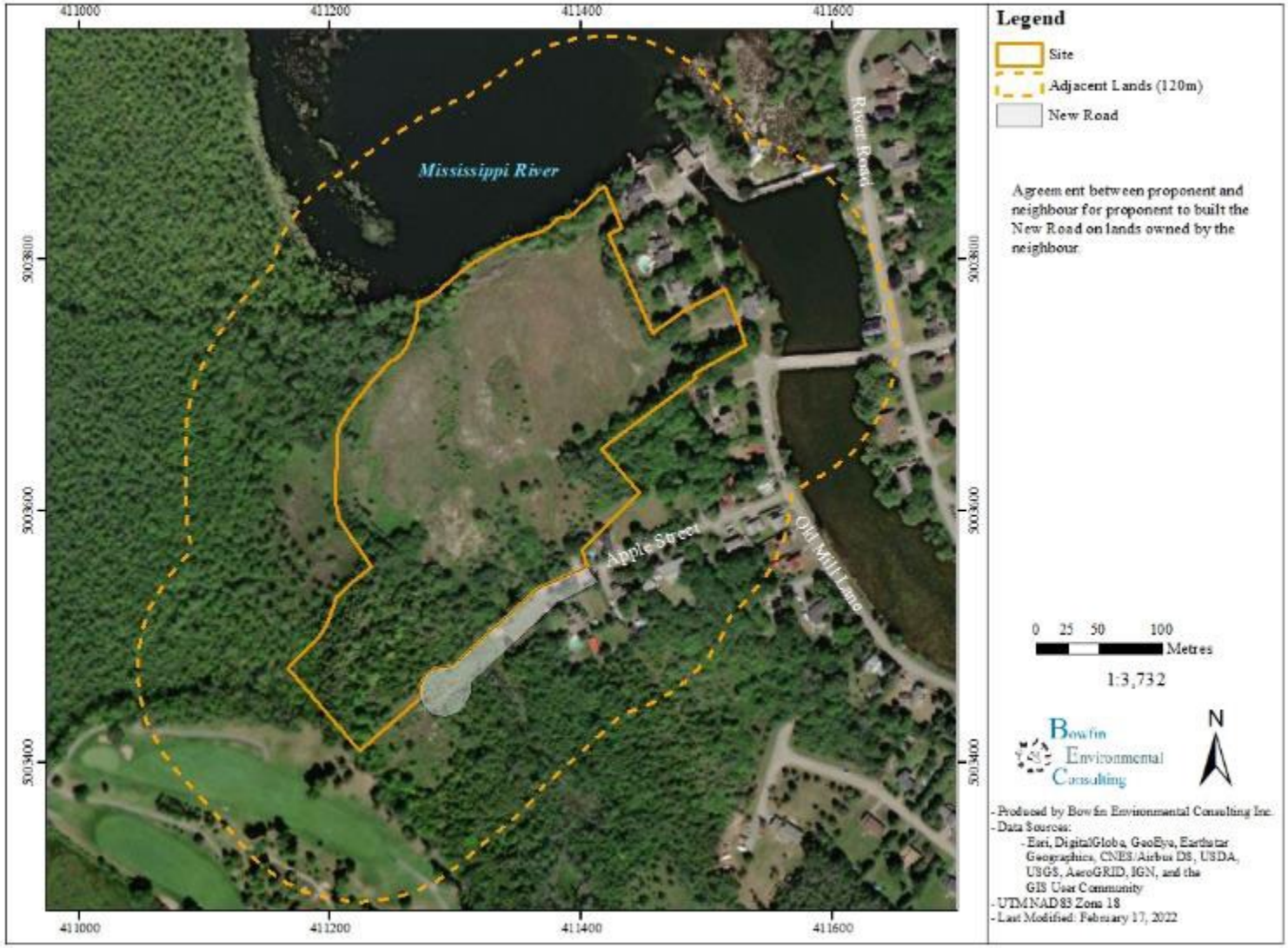


Figure 2: Site and the Adjacent Lands



2.0 METHODOLOGY

2.1 Site

For the most part, the OP calls for an evaluation of the areas to be impacted directly and the adjacent 120 m. This is widened when analyzing the potential for species at risk (SAR) as their protected habitats vary with the species being considered.

2.2 Background Review

Where the OP indicated that the features to be considered were those identified on their schedules, these took precedent. Other information collected from outside sources was used to help inform the functions of these features and to identify those not found on the schedules (i.e., Endangered and Threatened species habitat). Outside sources included: Natural Heritage Information Centre (NHIC) database, iNaturalist, Atlas of Breeding Birds of Ontario (ABBO), Make-a-Map Land Information Ontario (LIO), and LIO databases. Information from personal knowledge has also been included as appropriate. The desktop review included a larger area (~5 km).

2.3 Field Studies

Note that the following report relies on the findings of the site investigations completed during the initial EIS. In 2021 and 2022, additional field work was limited to confirming that the existing conditions, including the vegetation communities and wetland boundaries, remained the same and the completion of a butternut inventory.

2.3.1 Habitat Descriptions and Flora Observations

Habitat mapping of the communities within the site was completed using satellite imaging and verified during the field visits. The field studies were completed by systematically walking the site. Specific habitat types within the site, identified during the preliminary mapping exercise were also targeted for community description. Habitat descriptions were based on the appropriate methodologies such as: *Ontario Wetland Evaluation System, Southern Manual* (OWES) for wetland habitats and the *Ecological Land Classification for Southern Ontario* (ELC) for terrestrial habitats. OWES was utilized when the community meet its definition of a wetland which is:

> "*Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants*".

OWES defines the wetland boundary as the location where over 50% of the plant community consists of upland species with the woody vegetation layer (trees and shrubs) taking precedence over the herbaceous layer (OMNR 1994). Furthermore, the presence of large numbers of obligate upland species requires an upland classification. The edge of the wetland communities was marked with a handheld GPS (using NAD83 coordinate system).

Representative plant species were recorded within the communities and a running list of plants observed within the site was kept (Appendix A). Specific attention was paid to locating species at risk (SAR) or species of conservation value[1] listed as potentially occurring within the site. If these species were observed, they would be photographed, and their coordinates recorded on a handheld GPS using NAD83. Plants that could not be identified in the field were collected for a more detailed examination in the laboratory. Nomenclature used in this report follows the Southern Ontario Plant List (Bradley, 2007) for both common and scientific names which are based on Newmaster *et al.* (1998). Authorities for scientific names are given in Newmaster *et al.* (1998).

2.3.2 Butternut Inventory

Butternuts are an endangered species. While the Ministry of Environment, Conservation and Parks (MECP) is now responsible for the *Endangered Species Act* (ESA), they have not provided new guidelines. Previously, the MNRF certified Butternut Health Assessors (BHA) to complete Butternut Health Assessments as per MNRF's guidelines[2]. Any individuals noted would be marked with white spray paint and flagging tape and numbered sequentially. Their UTMs, using a GPS unit set at NAD83, would be recorded and the individual would be assessed by a certified BHA assessor according to the BHA protocol.

2.3.3 Bird Surveys

The terrestrial work included daytime breeding bird (grassland) completed in 2014 and nighttime completed in 2016. The daytime surveys meet the following requirements:

- three visits were completed between June 1st and first week in July. These were spaced a minimum of one week apart with the first and third visit spaced a minimum of 15 days apart from one another;
- began no earlier than 30 minutes after dawn and completed by 0900 hours;
- conducted on a day with no rain, little to no wind and good visibility;
- included linear transects spaced 250 m apart with point counts every 250 m;

[1] "Species of conservation value" are those species listed as S1-S3 or as Special Concern (provincially or federally) or endangered or threatened federal species that are not fish and are not listed as endangered or threatened provincially.

[2] It is acknowledged that the MECP is now updating the BHA to a Butternut Health Expert (BHE) and updating the protocols. These are not available at this time (January 31, 2022)

    - point counts consisted of listening and observing for SAR species over a 10 min period recording the number heard/seen, their sex, location, behaviour and interactions with other Bobolinks or other species;
- while walking between points, any additional SAR observations was recorded; and
- a list of all birds observed was also compiled.

Birds were identified by sound and/or sight.

The nighttime surveys were completed following the MNRF *Draft Survey Protocol for Eastern Whip-poor-will (Caprimulgus vociferus) in Ontario* (OMNRF, May 2014). These methods are summarized below:

- Three surveys were completed between late May 18 and June 30 and during appropriate conditions [over 10°C calm winds (less than 3 on the Beaufort scale)], 50% or more visible moon face illuminated & moon over the horizon].
- Surveys were completed at night (beginning 30 minutes after sunset and ending at least 15 minutes before sunrise, provided that the moon is above the horizon).
- Two of the surveys could be conducted on successive nights and only one of the surveys can be completed on a night with less than 50% illumination.
- When possible and depending on the timing of the moon phase, two of the visits were targeted for late May and the first week in June.
- Survey points were established no further than 500 m apart within appropriate habitats.
- The surveys consisted of a 6-min listening period at each point. The surveyor recorded: number of whip-poor-wills, their behaviour (i.e., calling, perched, flushed), movement, note whether the same bird has been heard at another point and approximate direction and distance.
- If a whip-poor-will was heard calling, then the surveyors would walk apart until a distance of 50-60 m was established between the two surveyors and the call(s) noted from these new locations. The purpose of this step is to help triangulate nests and/or defended area.
- Additional notes on any whip-poor-wills heard between points would be recorded.

Survey point locations are depicted on Figure 4 and Figure 5.

2.3.4 Amphibian Surveys

The amphibian surveys followed the Marsh Monitoring Program (MMP) protocol which requires three nighttime visits targeting the early, mid, and late breeding species. The visits were conducted no earlier than ½ hour after sunset and no later than midnight. The ambient conditions targeted nights with low wind. The typical timing of the visit listed below but note that air temperatures take precedence over the dates:

Visit 1 April 15-30 when nighttime air temperatures are >5°C
Visit 2 May 15-30 when nighttime air temperatures are >10°C
Visit 3 June 15-30 when nighttime air temperatures are >17°C

2.3.5 Fish Community Sampling

While the fish habitat associated with the north wetland and the Mississippi River have been avoided by design, with a suitable setback, the proposed road will travel near the edge of potential fish habitat in the Southern Wetland. Fish community was sampled using a backpack electrofisher (Smith-root). The fish were identified, counted, measured [fork length (FL)/total length (TL) as appropriate], and released. The transect length, approximate width, volts, current and effort were also recorded.

2.3.6 Incidental Fauna Observations

During all visits, any wildlife observations were recorded. Incidental observations included observations of an individual, its tracks, burrows, feces and/or kill sights.

Figure 3: Butternut Survey Location (2021)

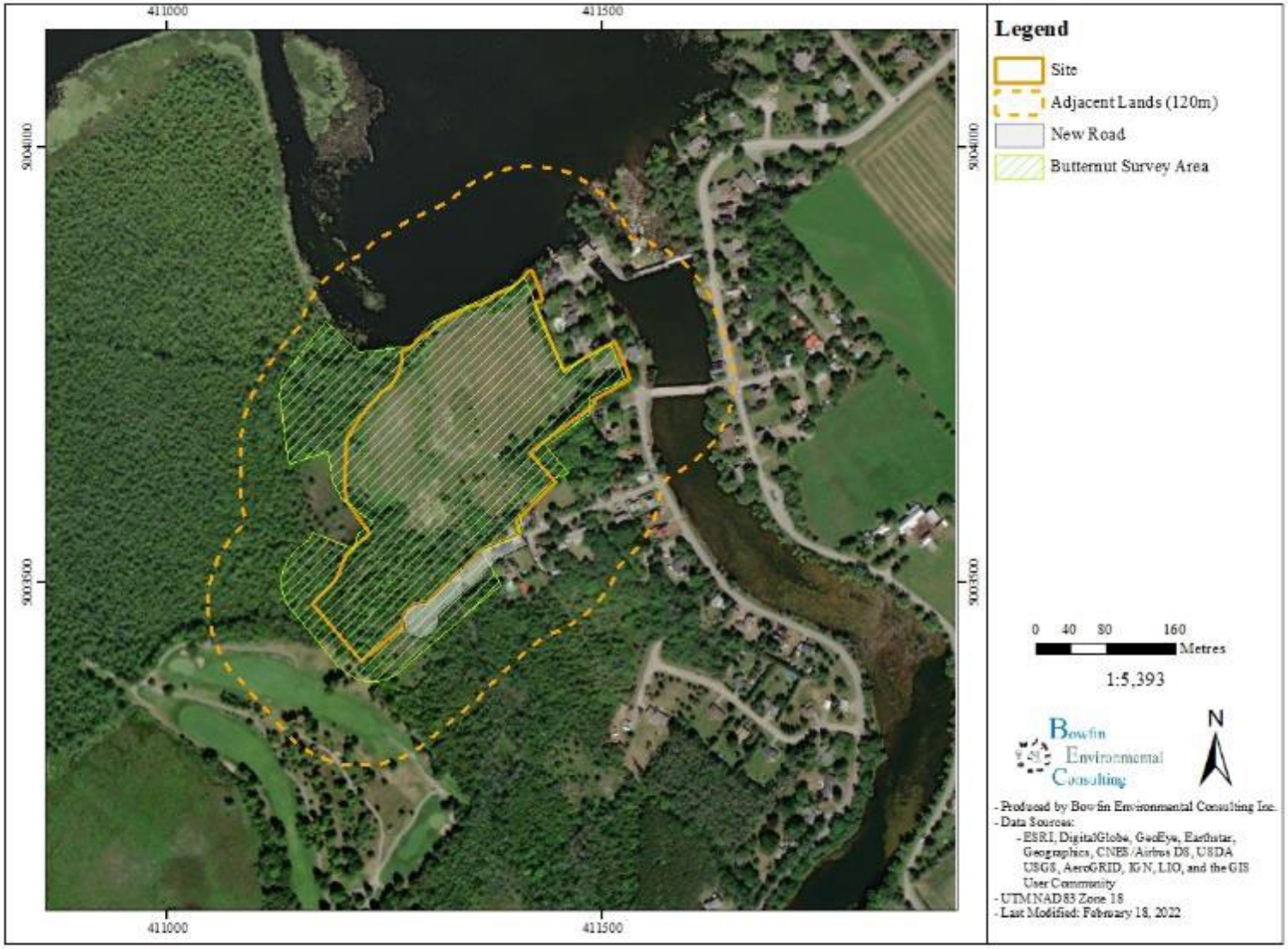


Figure 4: Daytime Breeding Bird Survey Locations (2014)

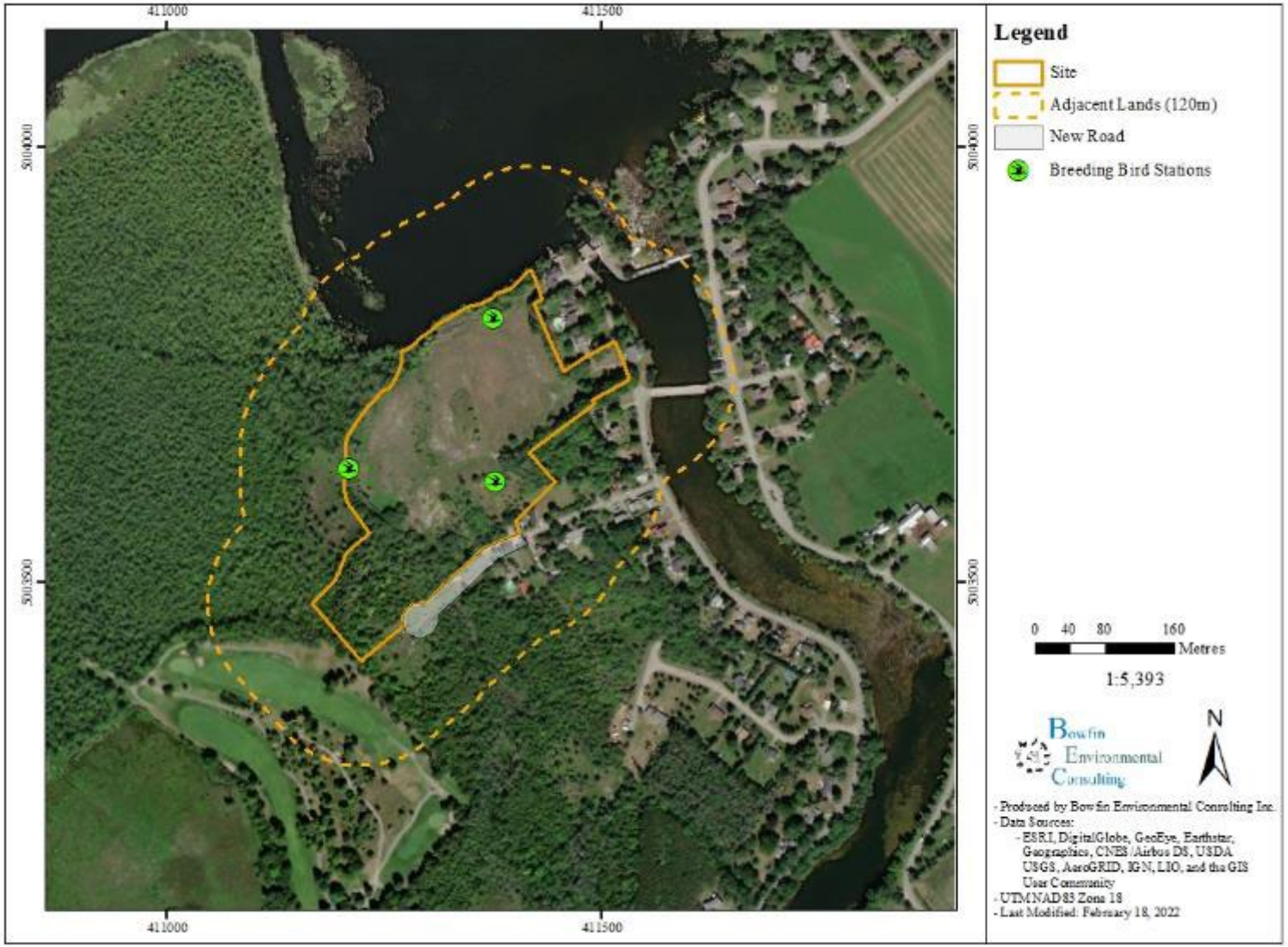
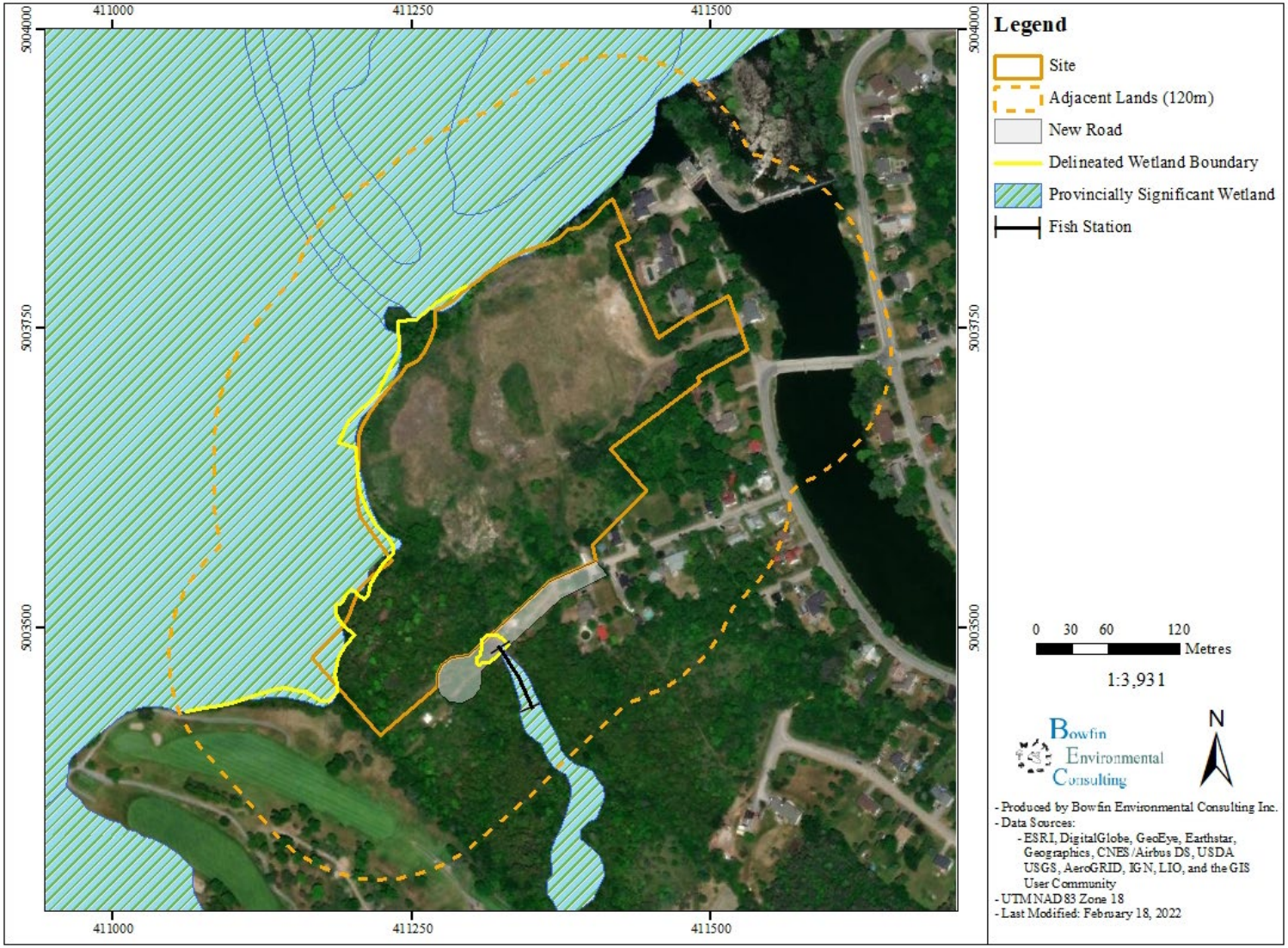


Figure 5: Eastern Whip-poor-will Survey Station (2016)



3.0 BACKGROUND INFORMATION

3.1 Location

This site is Part of Lot 4 Concession 10 in the Geographic Township of Ramsay, Town of Mississippi Mills, County of Lanark. The lands in question include approximately 4 hectares and are bordered by the Mississippi River to the north and east.

3.2 Natural Heritage Features

The schedules associated with both the Mississippi Mills and Lanark official plans identify the presence of Appleton Swamp, a provincially significant wetland (PWS) on the north and west edges of the site and south of the proposed road. The northern portion of the wetland is also Area of Natural and Scientific Interest (Candidate, Life Science). The schedules identify the Mississippi River as fish habitat. No other natural features are present on the Lanark OP, but the Mississippi Mills OP identifies significant woodland to the west.

In 2016, Bowfin completed a wetland boundary review on and within 120 m of the Site. This resulted in a slight change to the northern PSW habitats. The results were shared with MVCA and the Ministry of Northern Development, Mines, and Natural Resources and Forestry (NDMNRF). NDMNRF approved these changes, and that boundary is now reflected in the provincial mapping. NDMNRF also updated its PSW layer using OrthoImagery in 2019 (email from NDMNRF dated July 12, 2022). Through that work, they added the area identified herein as the southern wetland to the PSW layer.

Table 1: Summary of Available Background Information on the Identified Natural Features

Natural Heritage Feature	Present within Site	Present within 120 m of Site	Additional Notes
Provincially Significant Wetlands (PSW)	Appleton Swamp is present within the site and extends to the north, south, and west		None
Areas of Natural and Scientific Interest (ANSIs)	The Appleton Swamp (Candidate, Life Sciences) is present on site and extending to the west and north		None
Habitats or species designated by ESA (Provincial)	Potential for endangered or threatened species needs to be determined following assessment of the suitable habitats in or near the site. Preliminary review of the satellite images suggests that there is a potential for Blanding's Turtle, Eastern whip-poor-will, Bobolink, Eastern Meadowlark, bats, and Butternuts at this		None

Natural Heritage Feature	Present within Site	Present within 120 m of Site	Additional Notes
	site. See section 5 of this report for more information.		
Significant Woodlands	Significant Woodlands are identified on the Mississippi Mills OP on the western side of the site extending to both the north and south.		None
Significant Valleylands	None identified on OP		None
Significant Wildlife Habitat (SWH)	None identified on Schedules near site		None
Fish Habitat	None	Mississippi River and channels within Appleton PSW	None

Figure 6: Mississippi Mills Official Plan Land Use

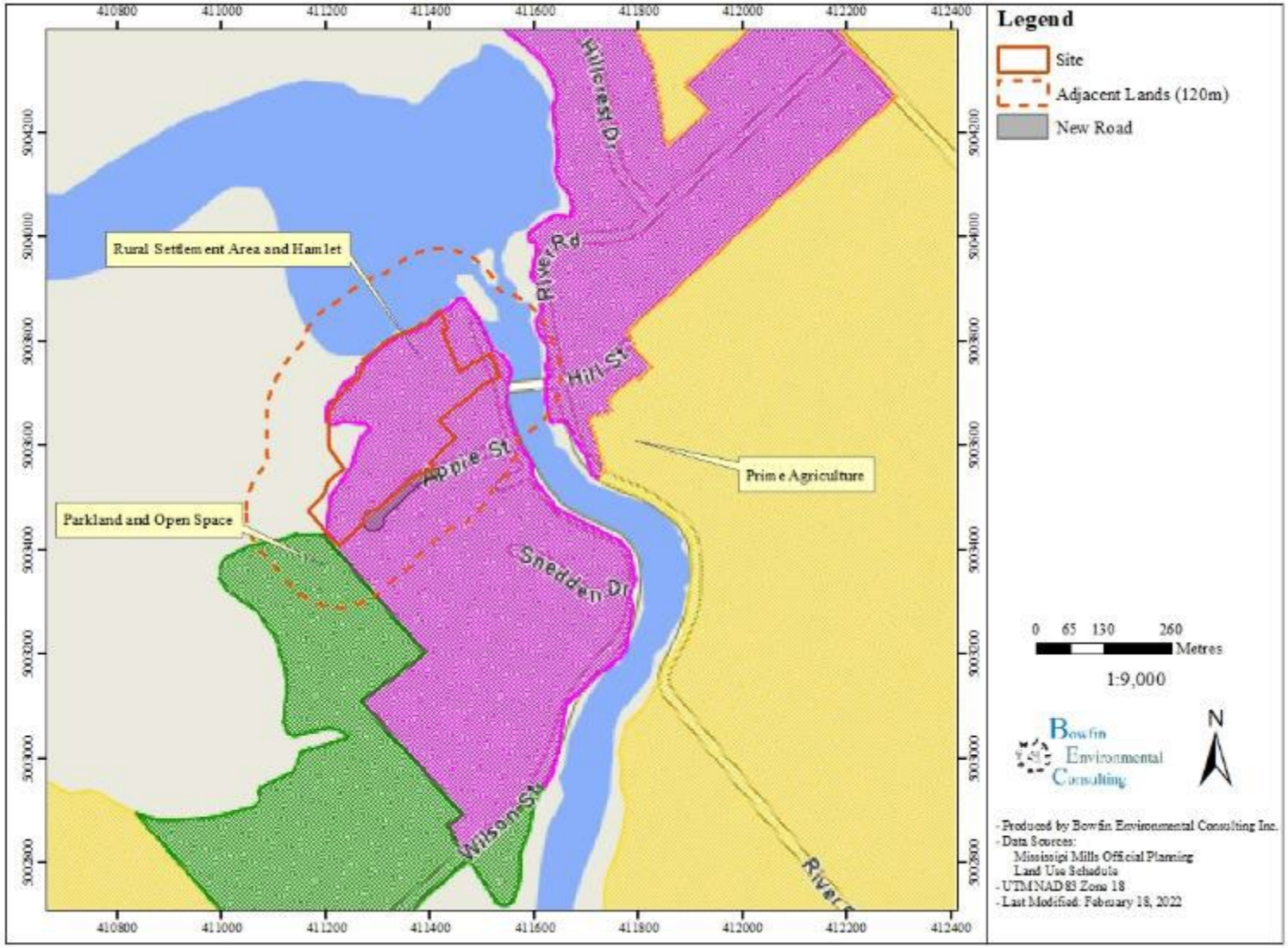


Figure 7: Lanark Official Plan A - Land Use and Natural Features

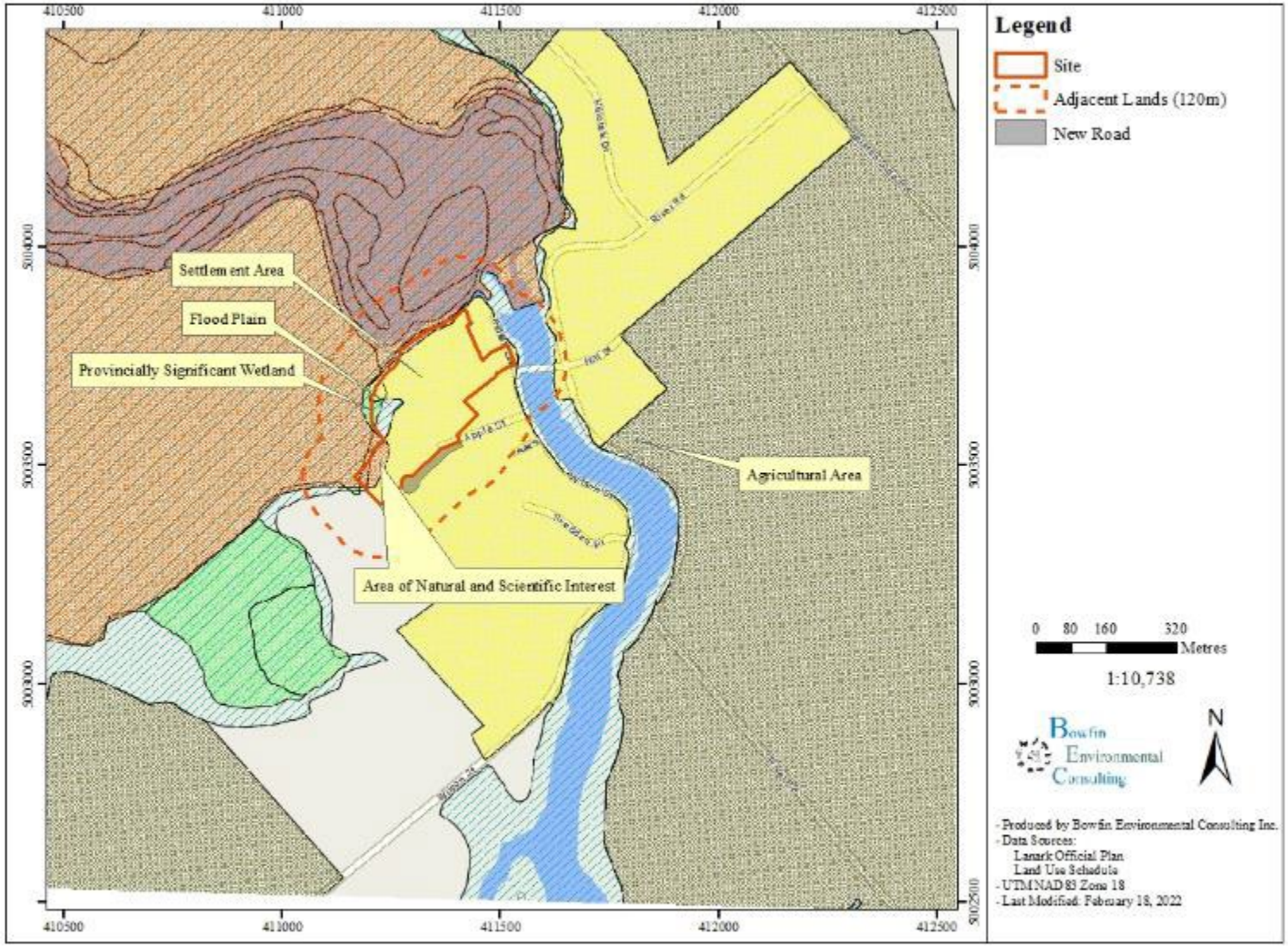


Figure 8: Mississippi Mills Official Plan Natural Features

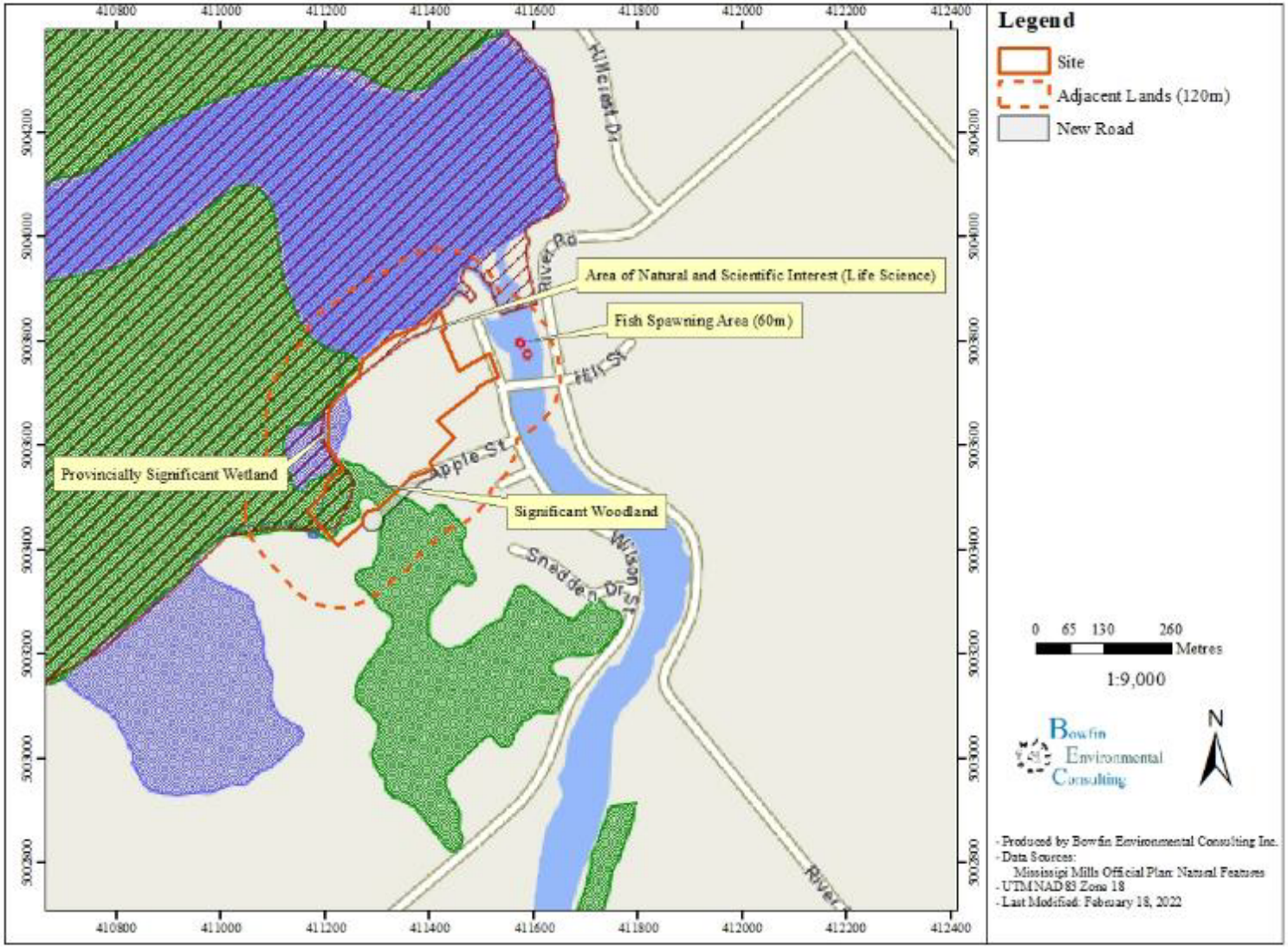


Figure 9: MVCA Wetland and Regulation Boundaries

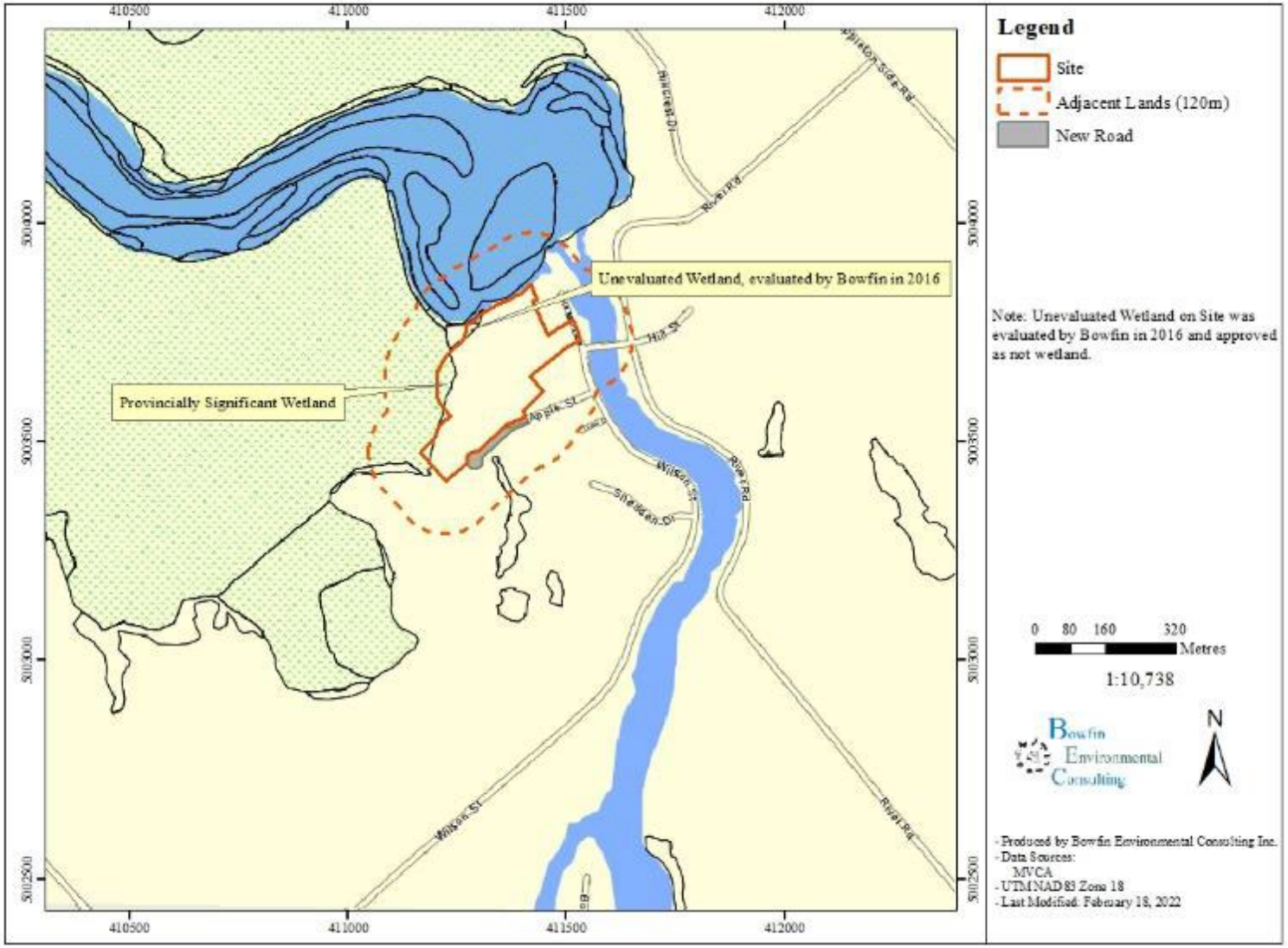
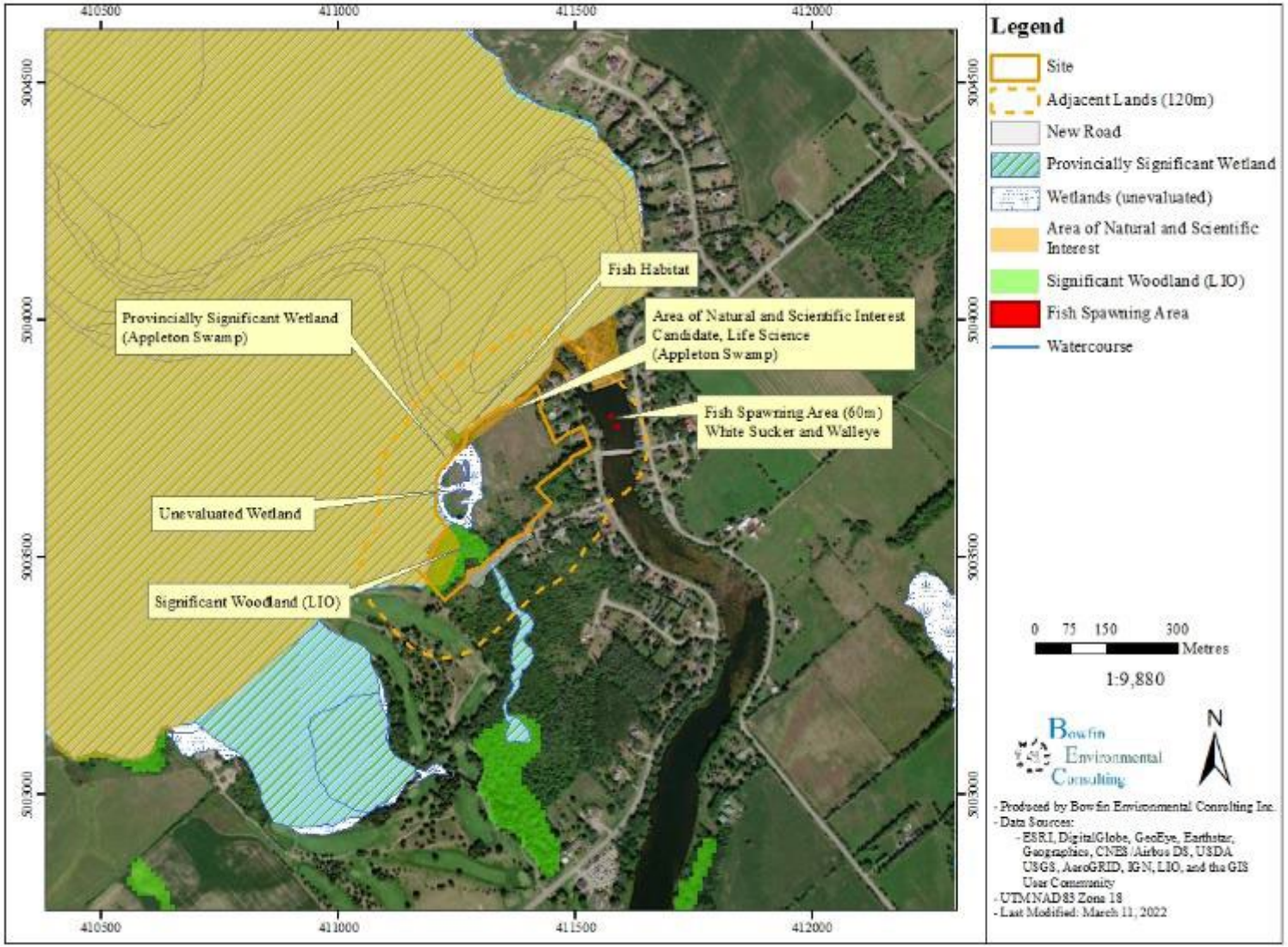


Figure 10: Background Information on Known Natural Heritage Features from LIO



3.2.1 Fish Habitat and Communities Details

The primary watercourse travelling along the north side of the site is the Mississippi River. This warm-water system is a tributary to the Ottawa River. The MVCA and LIO provided a list of 16 warm to cool water fish species on the Mississippi River, near the Site (Figure 11). Of these, five sport fish were identified (northern pike, brown bullhead, smallmouth bass, yellow perch and walleye) (Table 2). Three pan fish (rock bass, bluegill and pumpkinseed) were also listed. In addition, a white sucker and walleye spawning area is identified on the Mississippi River 60 m from the site. One species at risk, the American eel, has been recorded within 1 km of the site during tailrace surveys in the tailwaters below the Appleton Dam in 2011 (Community Stewardship Council of Lanark County 2012). Additionally, a species of special concern, the river redhorse is also noted to be in this section of the river. However, this conflicts with the information from DFO.

No information on potential fish habitat of the southern wetland was available.

The DFO National Aquatic Species at Risk Mapping (NASAR) indicated that there are no recordings of federal endangered or threatened species within this reach of the Mississippi River. It does identify the river redhorse but only downstream of the weir in the Town of Almonte (accessed on February 18, 2022).

Figure 11: Summary of Background Fish Community Information (from LIO)

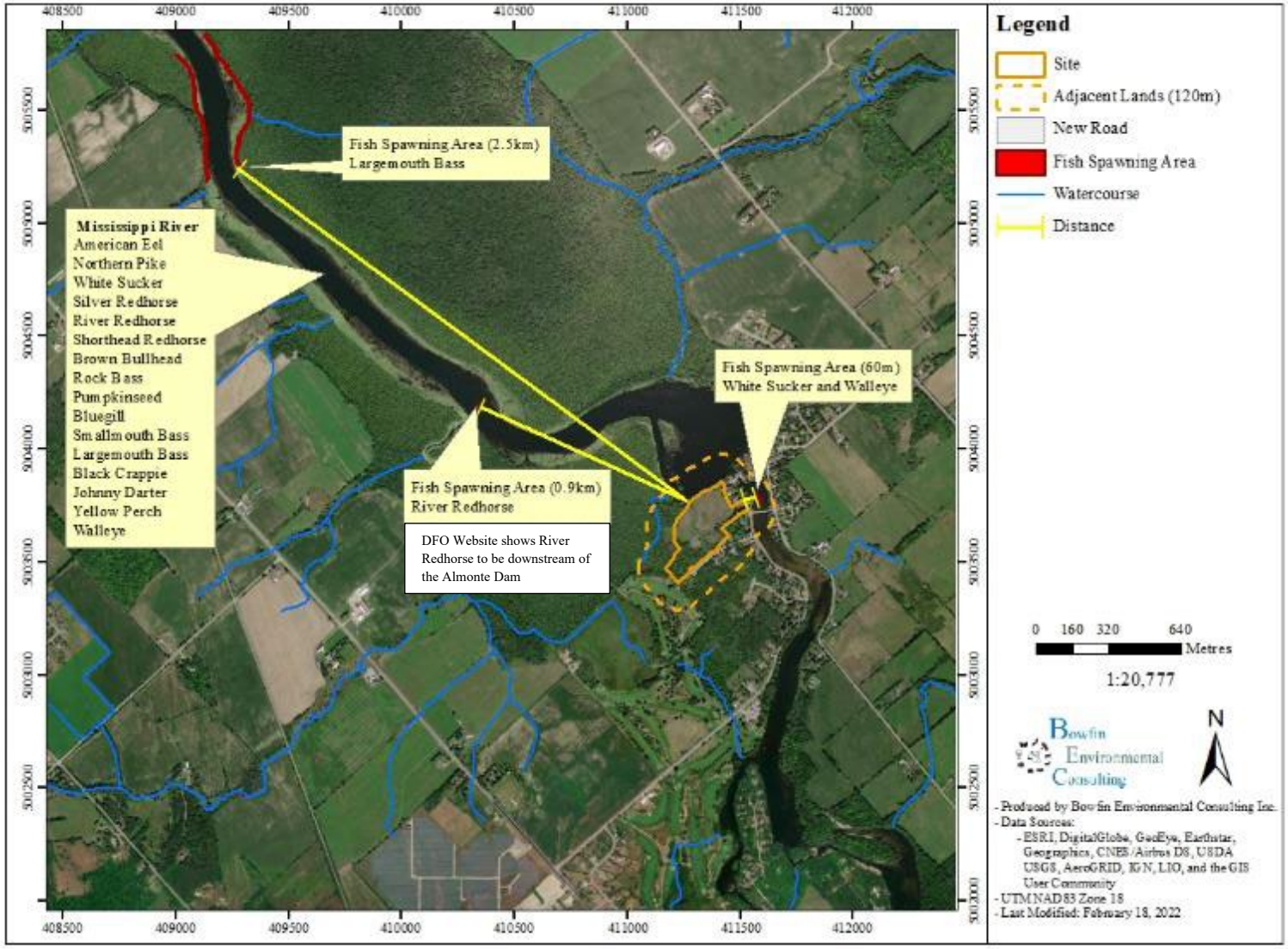


Table 2: Background Fish Community Information for Mississippi River

Common Name	Scientific Name	Trophic Class*	Thermal Regime	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status
American Eel	*Anguilla rostrata*	invertivore/carnivore	cool	S1?	END	No Status
Northern Pike	*Esox lucius*	carnivore	cool	S5	No Status	No Status
White Sucker	*Catostomus commersonii*	invertivore/ detritivore	cool	S5	No Status	No Status
Silver Redhorse	*Moxostoma anisurum*	invertivore	cool	S4	No Status	No Status
River Redhorse	*Moxostoma carinatum*	invertivore	cool	S2	SC	SC
Shorthead Redhorse	*Moxostoma macrolepidotum*	invertivore	warm	S5	No Status	No Status
Brown Bullhead	*Ameiurus nebulosus*	invertivore/ herbivore/ carnivore	warm	S5	No Status	No Status
Rock Bass	*Ambloplites rupestris*	invertivore/carnivore	cool	S5	No Status	No Status
Pumpkinseed	*Lepomis gibbosus*	invertivore/carnivore	warm	S5	No Status	No Status
Bluegill	*Lepomis macrochirus*	invertivore	warm	S5	No Status	No Status
Smallmouth Bass	*Micropterus dolomieu*	invertivore/ carnivore	cool	S5	No Status	No Status
Largemouth Bass	*Micropterus salmoides*	invertivore/ carnivore	warm	S5	No Status	No Status
Black Crappie	*Pomoxis nigromaculatus*	invertivore/ carnivore	cool	S4	No Status	No Status
Johnny Darter	*Etheostoma nigrum*	invertivore	cool	S5	No Status	No Status

Common Name	Scientific Name	Trophic Class*	Thermal Regime	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status
Yellow Perch	*Perca flavescens*	invertivore/ carnivore	cool	S5	No Status	No Status
Walleye	*Sander vitreus*	invertivore/carnivore	cool	S5	No Status	No Status
						Number of Species 16

(DFO, 2019; Eakins, 2018; OMNRF, 2014; MNRF, 2017; MTO, 2006, LIO 2018, MVCA 2020)

Status Updated: March 2021

SRANK DEFINITIONS

S4 Apparently Secure, Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 Secure, Common, widespread, and abundant in the nation or state/province.

SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities

4.0 SITE INVESTIGATION RESULTS

4.1 Site Investigation Dates and Purpose

As mentioned above, the purpose of this report was to update the previous EIS circulated in 2017. As many of the site investigations were not repeated, those from 2014-2022 are listed here.

Table 3: Summary of Dates, Times, Conditions and Purpose of Site Investigations

Date	Time (h)	Staff	Air Temperature (Min-Max) °C	Weather	Moon Visibility (%)	Purpose
June 15, 2014	0645-0730	M. Lavictoire	12.0 (9.6-23.9)	20% cloud cover, light air (1)	n/a	- Breeding Bird
June 22, 2014	0745-0815		12.0 (11.7-26.0)	clear skies, light air (1)	n/a	
July 4, 2014	0700-0745		16.0 (13.1-24.5)	70% cloud cover, light breeze (2)	n/a	
August 1, 2014	0930-1215	M. Lavictoire S. St. Pierre	23.0-26.0 (13.9-27.4)	5% cloud cover, gentle breeze changing to 15% cloud cover, light air (1)	n/a	- Ecological Land Classification - Wetland Classification - Butternut Survey
June 13, 2016	2230-2245	S. St. Pierre C. Fontaine	11.0 (8.7-21.3)	Clear skies, light air (1)	65.9	-Whip-poor-will Survey
June 18, 2016	2200-2230	M. Lavictoire S. Lavictoire	(11.2-31.7)	Clear skies, light air (1)	96.4	
June 24, 2016	2315-2345	S. St. Pierre C. Fontaine	20.0 (8.7-28.0)	Clear skies, light breeze (2)	84.4	
August 5, 2016	0745-0930	M. Lavictoire S. St. Pierre	22.0-26.0 (18.5-33.1)	20% cloud cover, light breeze changing to 20% cloud cover, light breeze (2)	n/a	- Ecological Land Classification - Wetland Classification - Butternut Survey
September 1, 2021	1010-1330	A. Quinsey	19.0 (11.8-23.2)	Clear skies light breeze (2)	n/a	- Butternut Survey
November 18, 2021	1115-1210	M. Lavictoire	8.0 (0.5-11.2)	100% cloud cover, gentle breeze (3)	n/a	-Vegetation
April 5, 2022	1030-1130	M. Lavictoire	9 (0.0-13.2)	Clear skies, light air (1)	n/a	-Review potential for fish habitat
April 20, 2022	2000-2045	A. Quinsey	7.0 (-0.6-8.9)	Clear skies, light air (1)	n/a	- Amphibian #1
May 25,	2115-	A. Quinsey	17.0	Mostly Cloudy,	n/a	- Amphibian #2

Date	Time (h)	Staff	Air Temperature (Min-Max) °C	Weather	Moon Visibility (%)	Purpose
2022	2130		(4.7-21.2)	light air (1)		
June 6, 2022	1200-1330	M. Lavictoire	20 (7.4-21.1)	Partially Cloudy, light air (1)	n/a	- Review Wetland Habitat
June 30, 2022	2020-2140	A. Quinsey	19.0 (10.4-25.0)	Cloudy, light breeze (2)	n/a	- Amphibian #3
August 12, 2022	0845-1045	S. Lafrance A. Quinsey	14	Sunny, light breeze (2) to moderate breeze (4)	n/a	-Fish Community Sampling

M. Lavictoire – Michelle (Nunas) Lavictoire – M. Sc. Natural Resources
S. St. Pierre – Shaun St. Pierre – B. Sc. Biology and Fisheries and Wildlife Technologist
C. Fontaine - Cody Fontaine - Fisheries and Wildlife Technologist
S. Lafrance – Sophie Lafrance - B.Sc. Biology and graduate diploma in Ecosystem Restoration
S. Lavictoire – Simon Lavictoire -Volunteer
A. Quinsey – Al Quinsey – B.Sc. Environmental Biology

*Min-Max Temp Taken From: Environment Canada. National Climate Data and Information Archive. Ottawa International Airport, Ontario. Available http://climate.weatheroffice.gc.ca/ [January 7, 2022]

4.2 Vegetation Description and Butternut Survey Results

The following is a description of the existing communities based on field investigations using the ELC and OWES methods as appropriate. Most of the information was gathered in 2014 with additional descriptions in 2016 and confirmation of communities in 2021.

Upland Communities

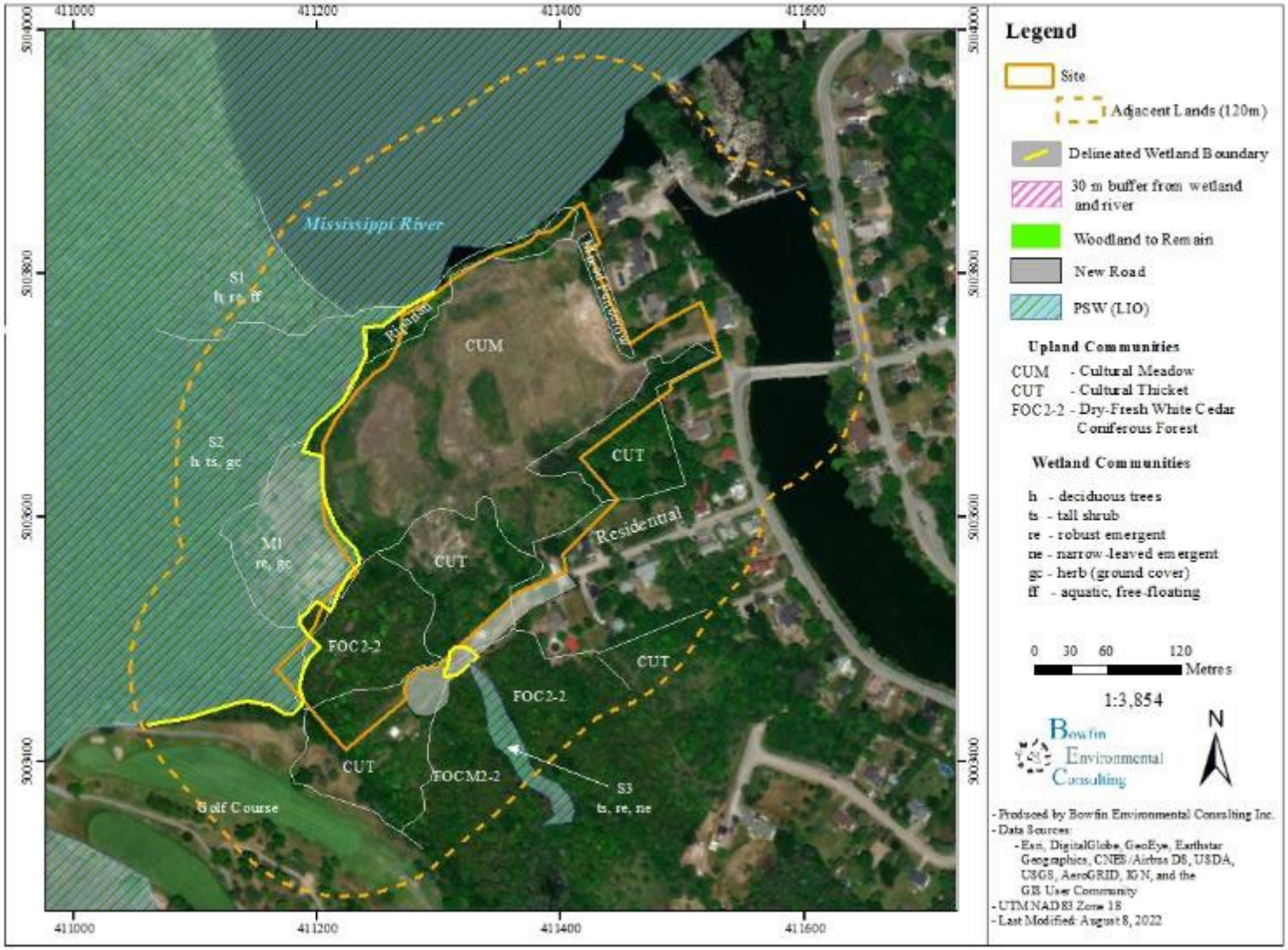
Cultural Meadow (CUM)

The majority of the site consisted of an old wooden mill that has been removed. The area included mostly flat lands with a stockpile in the middle and a berm around the outer edge on the east and north sides. Most of the site is now naturalized with broadleaf herbaceous cover. The main species were: white sweet-clover, tall goldenrod, wild carrot, and some common ragweed and bird's-foot trefoil. There was some regenerating woody species which were 1-2 m tall and provided 2% cover. These species included: hybrid crack willow, wild red raspberry, and apple trees.

Photo 1: Looking across meadow towards southwest thicket (September 1, 2021)

Photo 2: Looking northeast across meadow from top of berm (September 1, 2021)

Figure 12: Vegetation Communities



Cultural Thicket (CUT)

There were two Cultural Thickets within the site. The first community was in the south-western side of the site. The dominant layer was the understory (0.5-4 m tall; 60% cover) dominated by: common buckthorn along with staghorn sumac and some apple trees and prickly-ash. Both canopy and ground cover layers were also present. There was no sub-canopy. The canopy (6-8 m tall; 10% cover) included: Manitoba maple, black locus, and white cedar. The ground layer (100% cover) was characterized by: wild parsnip, wild carrot, and some European stinging nettle.

Photo 3: Southwestern cultural thicket (September 1, 2021)

The second community was in the south-eastern side of the site. The understory (2-4 m tall; 60% cover) was the dominant layer with the most abundant species being: common buckthorn followed by prickly-ash and black walnut. This community also included canopy and ground cover layers; no sub-canopy was present. The canopy (6-8 m tall; 20% cover) contained: sugar maple, trembling aspen, and white ash. The ground layer (10% cover) was characterized by: Virginia creeper, white avens and herb Robert. A very small trembling aspen inclusion was located along the western edge of this community.

Photo 4: Southeastern cultural thicket (September 1, 2021)

Dry-Fresh White Cedar Coniferous Forest (FOC2-2)

This community was found in the south-western side of the site and had 65% tree cover consisting of 95% coniferous trees. The overall DBH was 12 cm. The canopy was 4-8 m tall and provided 65% canopy cover. It was characterized by white cedar with a few sugar maples. There was no sub-canopy of understory. The ground layer (0.5 m tall; 1% cover) consisted of regenerating common buckthorn.

Photo 5: Dry-fresh white cedar coniferous forest (September 1, 2021)

Photo 6: Interface of Dry-fresh white cedar coniferous forest and wetland (notice slope on left side) (September 1, 2021)

Wetland Communities

As mentioned in the methods, the edge of the wetland was delineated within the site, submitted, and approved by NDMNRF. There was an abrupt transition between upland and wetland communities as a result of the steep banks along the Mississippi River and the berm found on-site. The communities bordering the property were described as per OWES by a certified evaluator. Three communities all forming part of the Appleton Wetland were identified: two deciduous treed swamps (S1 and S2) and one marsh (M1).

Swamp 1

The deciduous treed swamp along the Mississippi River on the northwest edge of the site was a three form wetland with deciduous trees as the dominant layer. The other layers were robust emergent and aquatic –free floating. There was approximately 25% open water within this part of the wetland. The dominant species in each layer were: deciduous trees (silver maple), robust emergent (bur-reed species) and aquatic – free floating (lesser duckweed).

Photo 7: Swamp 1 (September 1, 2021)

Swamp 2

Swamp 2 was situated immediately north and west of the berm. This community contained three forms (h, ts, gc) dominated by the deciduous tree layer. The deciduous trees consisted of green ash, black ash, American elm, and red maple. The tall shrub layer contained: common buckthorn, and black ash and American elm (<6 m tall). The ground cover was characterized by partridgeberry, poison-ivy, Canada enchanter's nightshade and Virginia creeper. A very small

robust emergent mash inclusion was also noted within this community (broad-leaved cattail).

Photo 8: Swamp 2 (September 1, 2021)

Photo 9: Robust emergent marsh inclusion in Swamp 2 (September 1, 2021)

Swamp 3 (Southern Wetland)

Swamp 3 was situated along the southern portion of the study area. This community contained three forms (ts, re, ne). The tall shrubs layer consisted of slender willow, gray dogwood, and green ash regeneration (<6 m tall). The robust emergent layer contained: broad-leaved cattail, bulrushes, and bur-reeds. The narrow-leaved emergent layer contained: reed canary grass, awl-fruited sedge, and greenish sedge.

Photo 10 Swamp 3 (August 1, 2014)

Marsh 1

The marsh consisted of two small communities which were described together as they were both <0.5 ha and neither contained any unusual composition or function. One dominated by robust emergents (broad-leaved cattail and common reed) and the other by ground cover (purple loosestrife, late goldenrod, European stinging nettle and cow vetch). There was a scattering of silver maples that were about 6 m tall within the cattail marsh section however these provided less than 25% cover and as such do not form part of the OWES description. The edge of the communities was distinct and commenced immediately west of the berm.

Photo 11: Marsh 1 (September 1, 2021)

Mississippi River Riparian Vegetation

The riparian vegetation along the south bank of the Mississippi River (north side of the study area) included both coniferous and deciduous species such as: sugar maple, American basswood, silver maple, white cedar, and common buckthorn. The herbaceous vegetation was dominated by Canada goldenrod, wild carrot, and white sweet-clover. The banks were steep especially along the east side where they terminated abruptly at the river. In the middle of the site, the banks and berm continued to be steep but there was a much wider treed area between them and the river.

Photo 12: Looking east at the steep banks on north edge of site(September 1, 2021)

Mixed Fencerow

The vegetation on the adjacent lands on the back of the residences on Old Mill Lane consisted of a mixed treed area. This narrow vegetative community had an overall DBH of 25 cm. The trees were 6-8 m tall and provided 100% canopy cover. The most common species were: white cedar, American basswood, white ash, white birch, and jack pine. The understory (2-4 m tall; 25% cover) was characterized by staghorn sumac with some common buckthorn and regenerating bitternut hickory.

Photo 13: Looking north along the edge of the mixed fencerow (September 1, 2021)

Daytime Breeding Birds

During the background review the species listed within the ABBO squares (18VQ09, 19 and 29 and 18VR00, 01, 10, 11 and 20) were considered as potentially occurring within the site. There were 157 species listed of which 113 were confirmed breeders, 28 probably and 15 possible. All of the bird species listed by ABBO birders were common species (S4 to S5) with the exception of seven provincially threatened and endangered species (bank swallow, barn swallow, bobolink, chimney swift, eastern meadowlark, least bittern, and loggerhead shrike). These species are discussed further under section 5.3.

The results from all the field visits found a total of 28 bird species on or heard from within the site (Appendix B). Of which 19 were in appropriate habitat within the site during one or more of the breeding bird surveys. Probable nests of song sparrows (in the Cultural Meadow) and red-winged blackbirds (in the marsh) were present within the site. No endangered or threatened

species were present.

Nighttime Breeding Bird Observations

Three eastern whip-poor-will surveys were completed on June 13, June 18, and June 24, 2016. The weather conditions on these dates were appropriate for whip-poor-will surveys. A summary of the site visits and ambient conditions during the visits is provided in Table 1.

No eastern whip-poor-wills were heard or observed. Review of other databases did not note any occurrences in the general area since 2016.

4.2.1 Plant Observations

Appendix B lists the plant species that were recorded within the site. A total of 117 species were identified of which 57% were native. This is considered below normal (average percentage of native species in Ontario tends to be near 70%) but was not unexpected due to the high disturbance of much of the site. All species are ranked at a value higher than S4. There were no species of conservation value or species at risk (SAR) documented. A butternut survey was conducted in 2014 and repeated in 2016 and 2021. No butternuts were found.

The Co-efficient of Conservatism (CC) of the species recorded provides information on the species' tolerance to disturbance; those species with a high CC (maximum of 10) are highly sensitive. The average CC for this site was 3.6 which would place it on the low of the sensitivity. The majority of the species had a CC value of 6 or lower (93%). There were two with a CC of 8 or 9 (red pine and jack pine) however both were found in the adjacent lands of the residence along Old Mill Lane and as such are likely planted. There were no plants with a CC of 10.

Table 4: Observed Plants

Common Name	Scientific Name	SRANK	Provincial Status (SARO)	Federal Status (SARA)	Coefficient of Conservatism
Northern Lady Fern	*Athyrium filix-femina var. angustum*	S5			4
Sensitive Fern	*Onoclea sensibilis*	S5			4
Royal Fern	*Osmunda regalis var. spectabilis*	S5			7
Common Juniper	*Juniperus communis var. depressa*	S5			4
Eastern White Cedar	*Thuja occidentalis*	S5			4
Jack Pine	*Pinus banksiana*	S5			9
Red Pine	*Pinus resinosa*	S5			8
Eastern Hemlock	*Tsuga canadensis*	S5			7

Common Name	Scientific Name	SRANK	Provincial Status (SARO)	Federal Status (SARA)	Coefficient of Conservatism
Manitoba Maple	*Acer negundo*	S5			0
Red Maple	*Acer rubrum*	S5			4
Silver Maple	*Acer saccharinum*	S5			5
Sugar Maple	*Acer saccharum*	S5			4
Black Maple	*Acer nigrum*	S4?			7
Western Poison-ivy	*Rhus radicans ssp. rydbergii*	S5			0
Staghorn Sumac	*Rhus typhina*	S5			1
Water-hemlock	*Cicuta sp.*				
Wild Carrot	*Daucus carota*	SNA			
Wild Parsnip	*Pastinaca sativa*	SNA			
Swamp Milkweed	*Asclepias incarnata ssp. incarnata*	S5			6
Common Milkweed	*Asclepias syriaca*	S5			0
Common Yarrow	*Achillea millefolium ssp. millefolium*	SNA			0
Common Ragweed	*Ambrosia artemisiifolia*	S5			0
Burdock	*Arctium sp.*				
Bur Marigold	*Bidens aristosa*	SNA			
Ox-eye Daisy	*Chrysanthemum leucanthemum*	SNA			
Bull Thistle	*Cirsium vulgare*	SNA			
Daisy Fleabane	*Erigeron annuus*	S5			0
Spotted Joe-pye-weed	*Eupatorium maculatum ssp. maculatum*	S5			3
Grass-leaved Goldenrod	*Euthamia graminifolia*	S5			2
Field Hawkweed	*Hieracium caespitosum ssp. caespitosum*	SNA			
Black-eyed Susan	*Rudbeckia hirta*	S5			0
Tall Goldenrod	*Solidago altissima*	S5			1
Canada Goldenrod	*Solidago canadensis*	S5			1
Zig-zag Goldenrod	*Solidago flexicaulis*	S5			6
Late Goldenrod	*Solidago gigantea*	S5			4
Common Tansy	*Tanacetum vulgare*	SNA			
Meadow Goat's-beard	*Tragopogon pratensis ssp. pratensis*	SNA			
Spotted Jewel-weed	*Impatiens capensis*	S5			4
Japanese Barberry	*Berberis thunbergii*	SNA			
White Birch	*Betula papyrifera*	S5			
Viper's Bugloss	*Echium vulgare*	SNA			
Field Mustard	*Brassica rapa*	SNA			
Dame's Rocket	*Hesperis matronalis*	SNA			
Twinflower	*Linnaea borealis*	S5			7

Common Name	Scientific Name	SRANK	Provincial Status (SARO)	Federal Status (SARA)	Coefficient of Conservatism
Bladder Campion	*Silene latifolia*	SNA			
Field Bindweed	*Convolvulus arvensis*	SNA			
Gray Dogwood	*Cornus foemina ssp. racemosa*	S5			2
Red-osier Dogwood	*Cornus stolonifera*	S5			2
Bird's-foot Trefoil	*Lotus corniculatus*	SNA			
Black Medick	*Medicago lupulina*	SNA			
White Sweet-clover	*Melilotus alba*	SNA			
Yellow Sweet-clover	*Melilotus officinalis*	SNA			
Black Locust	*Robinia pseudo-acacia*	SNA			
Red Clover	*Trifolium pratense*	SNA			
White Clover	*Trifolium repens*	SNA			
Cow Vetch	*Vicia cracca*	SNA			
Herb-robert	*Geranium robertianum*	SNA			
Common St. John's-wort	*Hypericum perforatum*	SNA			
Bitternut Hickory	*Carya cordiformis*	S5			6
Black Walnut	*Juglans nigra*	S4			5
Ground Ivy	*Galeopsis hederacea*	SNA			
Cut-leaved Water-horehound	*Lycopus americanus*	S5			4
American Wild Mint	*Mentha arvensis ssp. borealis*	S5			3
Catnip	*Nepeta cataria*	SNA			
Purple Loosestrife	*Lythrum salicaria*	SNA			
White Ash	*Fraxinus americana*	S5			4
Black Ash	*Fraxinus nigra*	S5			7
Green Ash	*Fraxinus pennsylvanica*	S5			3
Canada Enchanter's Nightshade	*Circaea lutetiana ssp. canadensis*	S5			3
Upright Yellow Wood-sorrel	*Oxalis stricta*	S5			0
Common Plantain	*Plantago major*	SNA			
Great Water Dock	*Rumex orbiculatus*	S4S5			6
Swamp Candles	*Lysimachia terrestris*	S5			6
Canada Anemone	*Anemone canadensis*	S5			3
Tall Meadow-rue	*Thalictrum pubescens*	S5			5
Common Buckthorn	*Rhamnus cathartica*	SNA			
Common Strawberry	*Fragaria virginiana ssp. virginiana*	S5			2
White Avens	*Geum canadense*	S5			3
Apple sp.	*Malus sp.*				
Black Cherry	*Prunus serotina*	S5			3
Wild Red Raspberry	*Rubus idaeus ssp.*	S5			0

Common Name	Scientific Name	SRANK	Provincial Status (SARO)	Federal Status (SARA)	Coefficient of Conservatism
	strigosus				
Smooth Bedstraw	*Galium mollugo*	SNA			
Partridge Berry	*Mitchella repens*	S5			6
Prickly-ash	*Zanthoxylum americanum*	S5			3
Balsam Poplar	*Populus balsamifera*	S5			4
Trembling Aspen	*Populus tremuloides*	S5			
Crack Willow	*Salix fragilis*	SNA			
Slender Willow	*Salix petiolaris*	S5			3
Butter-and-eggs	*Linaria vulgaris*	SNA			
Common Mullein	*Verbascum thapsus*	SNA			
Bittersweet Nightshade	*Solanum dulcamara*	SNA			
American Basswood	*Tilia americana*	S5			4
American Elm	*Ulmus americana*	S5			3
Wood Nettle	*Laportea canadensis*	S5			6
European Stinging Nettle	*Urtica dioica ssp. dioica*	SNA			
Blue Vervain	*Verbena hastata*	S5			4
Virginia Creeper	*Parthenocissus inserta*	S5			3
Riverbank Grape	*Vitis riparia*	S5			0
Common Water-plantain	*Alisma trivale*	S5			3
Common Arrowhead	*Sagittaria latifolia*	S5			4
Fringed Sedge	*Carex crinita*	S5			6
Cypress-like Sedge	*Carex pseudo-cyperus*	S5			6
Awl-fruited Sedge	*Carex stipata*	S5			3
Greenish Sedge	*Carex viridula*	S5			5
Wool-grass	*Scirpus cyperinus*	S5			4
European Frog's-bit	*Hydrocharis morsus-ranae*	SNA			
Northern Blue-flag	*Iris versicolor*	S5			5
Lesser Duckweed	*Lemna minor*	S5			2
Grass Family	*Poaceae*				
Red-top	*Agrostis gigantea*	SNA			0
Smooth Brome	*Bromus inermis ssp. inermis*	SNA			
Canada Blue-joint	*Calamagrostis canadensis*	S5			4
Barnyard Grass	*Echinochloa crusgalli*	SNA			
Quack Grass	*Elymus repens*	SNA			
Rice Cut Grass	*Leersia oryzoides*	S5			3
Muhly	*Muhlenbergia sp.*				
Reed Canary Grass	*Phalaris arundinacea*	S5			0
Timothy	*Phleum pratense*	SNA			
Common Reed	*Phragmites australis*	S5			0
Pickerel-weed	*Pontederia cordata*	S5			7
Giant Bur-reed	*Sparganium eurycarpum*	S5			3

Common Name	Scientific Name	SRANK	Provincial Status (SARO)	Federal Status (SARA)	Coefficient of Conservatism
Broad-leaved Cattail	*Typha latifolia*	S5			3

SRANK DEFINITIONS

S4 Apparently Secure, Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure, Common, widespread, and abundant in the nation or state/province.
SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# Range Rank, A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
? Inexact Numeric Rank—Denotes inexact numeric rank
S#B Breeding
S#N Non-Breeding

Coefficient of conservatism ranking criteria

0 Obligate to ruderal areas.
1 Occurs more frequently in ruderal areas than natural areas.
2 Facultative to ruderal and natural areas.
3 Occurs less frequent in ruderal areas than natural areas.
4 Occurs much more frequently in natural areas than ruderal areas.
5 Obligate to natural areas (quality of area is low).
6 Weak affinity to high-quality natural areas.
7 Moderate affinity to high-quality natural areas.
8 High affinity to high-quality natural areas.
9 Very high affinity to high-quality natural areas.
10 Obligate to high-quality natural areas.

4.3 Amphibian Surveys

Amphibian surveys were conducted on days with appropriate weather conditions (Table 3). Frogs were heard calling from both wetlands surveyed, it total, 5 species were recorded (spring peeper, wood frog, grey treefrog and bullfrog) (Table 5) (Figure 13). The summarized results (in Table 5 and Figure 13) includes the species followed by the calling code and, when applicable, the number of individuals counted. The calling codes are:

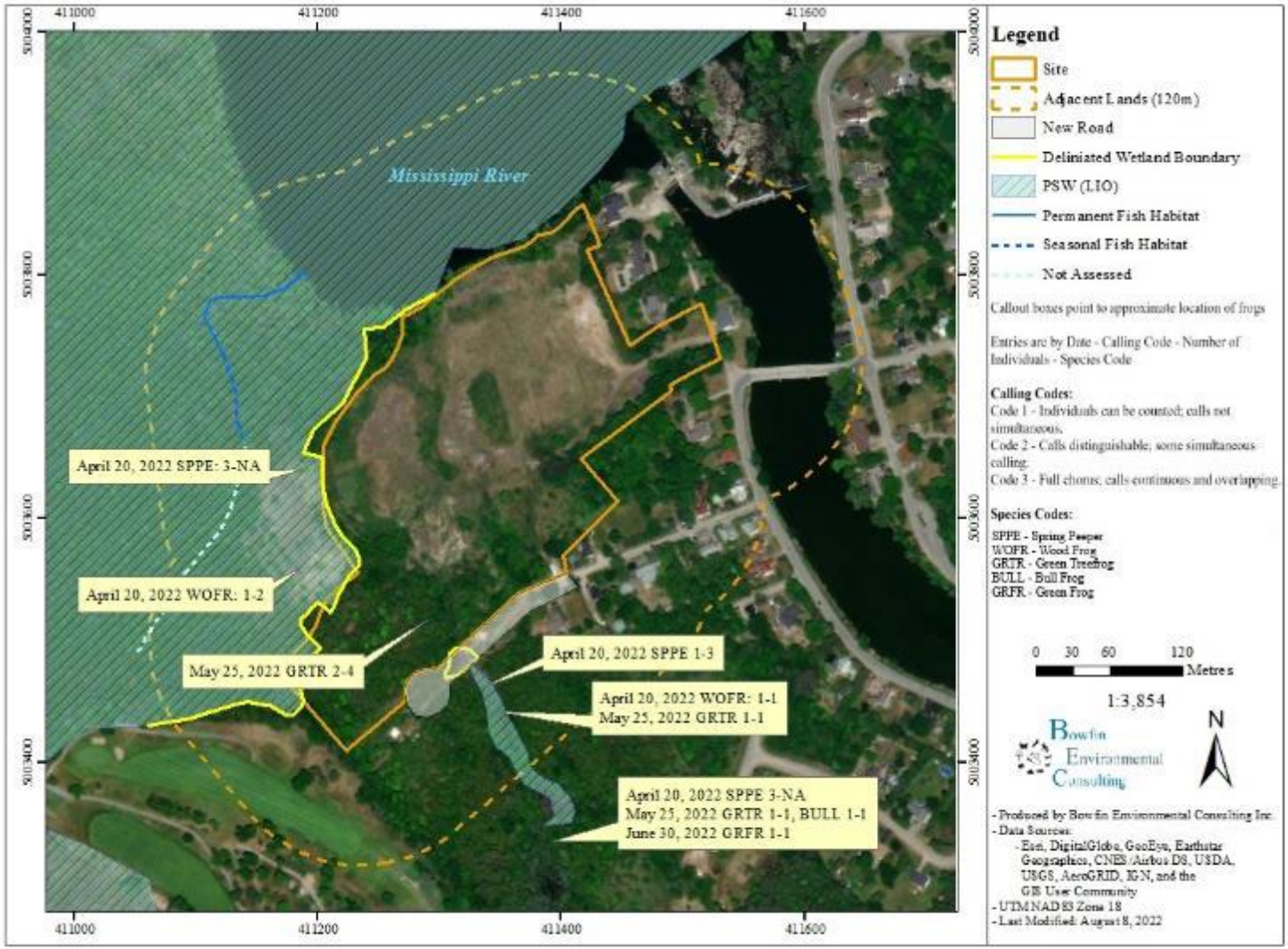
1 – Individuals can be counted, calls do not overlap
2 – Calls distinguishable, some simultaneous calling
3 – Full chorus, calls continuous and overlapping (number of individuals cannot be counted)

Table 5: Amphibian Survey Results

Survey Date	Western Wetland	Southern Wetland (Near Site)	Southern Wetland (120m from site)
April 20, 2022	Spring Peeper 3-NA Wood Frog 1-2	Spring Peeper 1-3 Wood Frog 1-1	Spring Peeper 3-NA
May 25, 2022	None	Grey Treefrog 1-1	Bullfrog 1-1 Grey Treefrog 1-1
June 30, 2022	None	None	Green Frog 1-1

(species calling code: number of individuals)

Figure 13: Amphibian Survey Results



4.4. Fish Habitat

The 2015 scope of the work did not include fish and fish habitat as the proponent agreed to a setback of 30 m from the north PSW and Mississippi River. Since that time, the location of the roadway has been confirmed. The potential for fish habitat in the northern and southern wetlands were evaluated. In 2014, 2016 and 2021, the review did not include an early spring visit. As such, the site was visited on April 5, 2022, to confirm the extent of potential direct fish habitat. It has been confirmed that there was no connection between the northern and southern wetlands, through the proposed road extension.

4.4.1 Northern Wetland

The only confirmed tributary to the Mississippi River found was in the swamp habitat of the northern PSW. Both permanent (bankfull depths are roughly 20 cm), and seasonal habitats were noted along with vernal pools that could be accessible to fish during spring, if waters in the Mississippi River were high enough. However, once in the marsh habitats, the vegetation was very thick, and no distinct channels were ever noted. This area was mostly dry in the spring (some accumulation of snowmelt at the base of the banks). The marsh habitat of the northern wetland did not provide direct fish habitat (the entire wetland is considered indirect fish habitat).

Photo 14: Looking from the permanent channel in the norther wetland towards Mississippi River (August 1, 2014)

Photo 15: Looking upstream on the permanent channel in the northern wetland from near the Mississippi River (August 1, 2014)

Photo 16: Not far upstream from previous photographs, the permanent habitat stops (August 1, 2014)

Photo 17: Potential seasonal habitat in the swamp community of the northern wetland (August 1, 2014)

Photo 18: Potential seasonal habitat in the northern wetland near the location depicted as watercourse on background mapping (August 1, 2014)

Photo 19: Edge of the pockets and robust emergent marsh, in the northern wetland, no distinct channel (August 1, 2014)

Photo 20: The banks of the berm and of the forest community along the edge of the northern wetland are steep and no fish habitat was present (April 5, 2022)

Photo 21: Looking down into the marsh of the norther wetland from the berm towards the southwest (April 5, 2022)

Photo 22: The banks of the berm are steep, and no fish habitat was present (April 5, 2022)

4.4.2 Southern Wetland

The portion of the southern wetland located within the alignment of the proposed roadway was not direct fish habitat. The wetland immediately south was also dry during the April 5, 2022, visit. However, further south, there was a channel and a pond habitat that can be observed from satellite imagery. Whether this southern wetland is connected to other wetlands or to the Mississippi River (to the south) could not be confirmed (private lands).

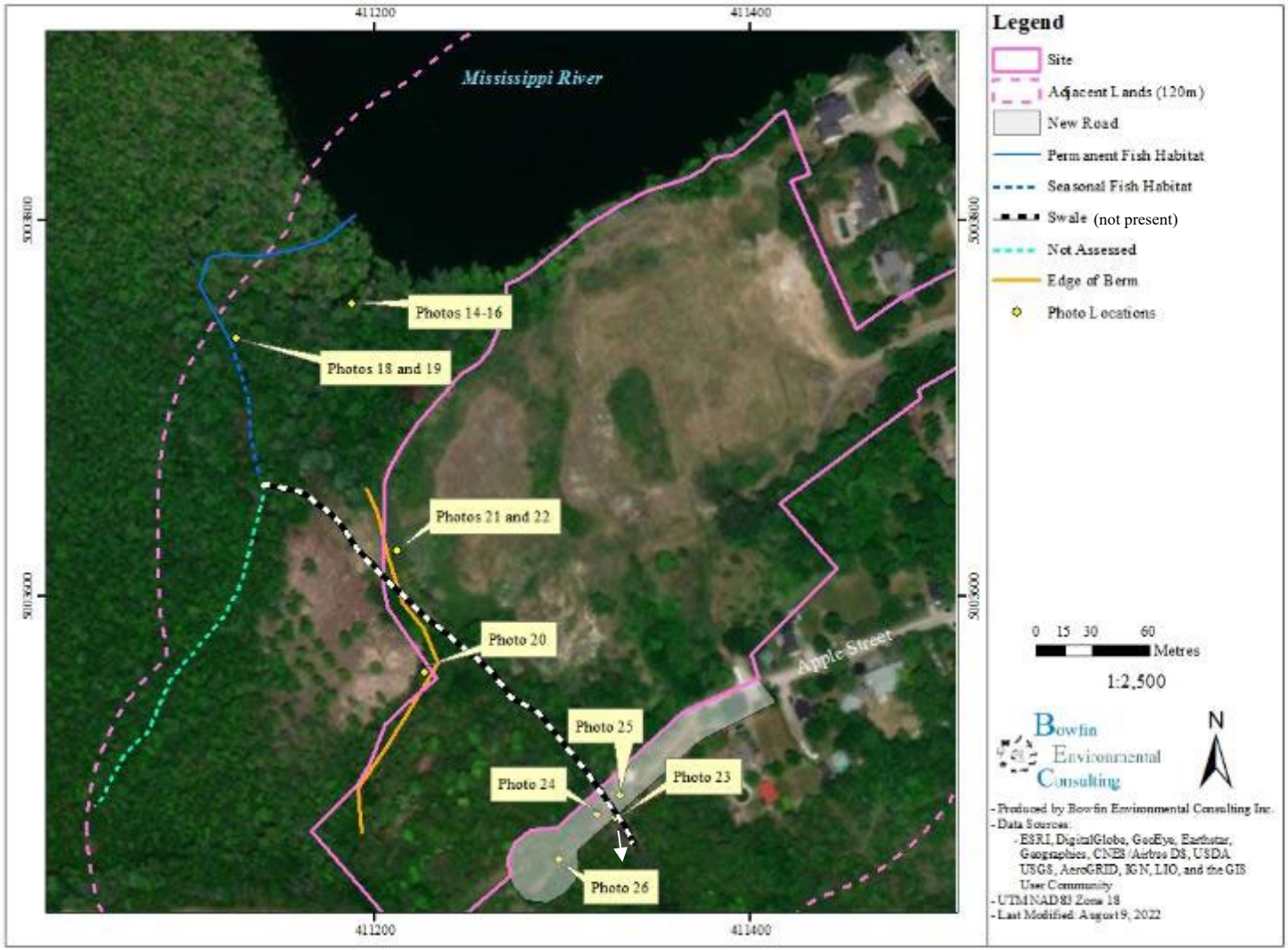
Photo 23: The edge of southern wetland, no direct fish habitat was present (April 5, 2022)

Photo 24: Looking along the road alignment, no fish habitat was present (April 20, 2022)

Photo 25: Looking along the road alignment, no fish habitat was present (April 20, 2022)

Photo 26: Looking along the road alignment, not fish habitat was present (June 30, 2022)

Figure 14: Information on Watercourses



Fish Community Sampling of Southern Wetland

The roadway would pass within a few metres of the southern wetland. This southern wetland offers permanent aquatic, shallow, aquatic habitat. On August 12, 2022, it was sampled with a backpack electrofisher.

The station sampled had an average wetted width of 4.47 m and average water depth of 12 cm (range 4-20 cm) on August 12, 2022. Much of the station along either bank was unfishable due to shallow water and dense vegetation The station was electrofished over an area of approximately 180 m² for 598 seconds (effort 3s/m^2). No fish were observed or captured.

Photo 27: Looking upstream from the upstream end of the sampling station (August 12, 2022)

Photo 28: Looking downstream from the upstream end of the sampling station (August 12, 2022)

Photo 29: Looking upstream from the downstream end of the sampling station (August 12, 2022)

Photo 30: Looking downstream from the downstream end of the sampling station (August 12, 2022)

4.5 Incidental Wildlife Observations

Incidental wildlife observations included several amphibians (American toad, bullfrog, northern leopard frog), painted turtle (far in distance along the edge of the river), chipmunk, red squirrel, and white-tailed deer.

Table 6: Observed Wildlife

Common Name	Scientific Name	SRank	Provincial Status (SARO)	Federal Status (SARA)
AMPHIBIANS				
American Toad	*Bufo americanus*	S5		
Bullfrog	*Rana catesbeiana*	S4		
Northern Leopard Frog	*Rana pipiens*	S5		
REPTILES				
Midland Painted Turtle	*Chrysemys picta marginata*	S4		
BIRDS				
Common Loon	*Gavia immer*	S5		
Great Blue Heron	*Ardea herodias*	S4		
Green Heron	*Butorides virescens*	S4B		
Mourning Dove	*Zenaida macroura*	S5		

Common Name	Scientific Name	SRank	Provincial Status (SARO)	Federal Status (SARA)
Northern Flicker	*Colaptes auratus*	S5		
Eastern Wood-Pewee	*Contopus virens*	S4B	SC	
Eastern Phoebe	*Sayornis phoebe*	S5B		
Eastern Kingbird	*Tyrannus tyrannus*	S4B		
Blue Jay	*Cyanocitta cristata*	S5		
American Crow	*Corvus brachyrhynchos*	S5B		
Black-capped Chickadee	*Poecile atricapilla*	S5		
White-breasted Nuthatch	*Sitta carolinensis*	S5		
American Robin	*Turdus migratorius*	S5B		
Gray Catbird	*Dumetella carolinensis*	S5B, S3N		
European Starling	*Sturnus vulgaris*	SNA		
Cedar Waxwing	*Bombycilla cedrorum*	S5B		
Yellow Warbler	*Dendroica petechia*	S5B		
Common Yellowthroat	*Geothlypis trichas*	S5B		
Song Sparrow	*Melospiza melodia*	S5B		
Swamp Sparrow	*Melospiza georgiana*	S5B, S4N		
Northern Cardinal	*Cardinalis cardinalis*	S5		
Indigo Bunting	*Passerina cyanea*	S5B		
Red-winged Blackbird	*Agelaius phoeniceus*	S5		
Common Grackle	*Quiscalus quiscula*	S5B		
Brown-headed Cowbird	*Molothrus ater*	S5		
Baltimore Oriole	*Icterus galbula*	S4B		
House Finch	*Carpodacus mexicanus*	SNA		
American Goldfinch	*Carduelis tristis*	S5B		
MAMMALS				
Eastern Chipmunk	*Tamias striatus*	S5		
Red Squirrel	*Tamiasciurus hudsonicus*	S5		
White-tailed Deer	*Odocoileus virginianus*	S5		

Status Updated February 10, 2022

SRANK DEFINITIONS

S3 Vulnerable, Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 Apparently Secure, Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure, Common, widespread, and abundant in the nation or state/province.
SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# Range Rank, A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
S#B Breeding
S#N Non-Breeding

SARO DEFINITIONS

SC Special Concern: A species with characteristics that make it sensitive to human activities or natural events.

5.0 ANALYSIS OF POTENTIAL TO IMPACT THE NATURAL FEATURES

The following section looks at the identified or potential natural features and the results from the field investigations to assess whether the feature is present and if present, whether it is significant based on the OP, or the *Natural Heritage Reference Manual* (OMNR, 2010), as applicable.

As mentioned above, the OP indicated significant valleylands and significant wildlife habitat were not present in or within 120 m of the site. Features identified as present or requiring further investigations were:

- Potential for - Endangered and Threatened species/habitats
- Provincially Significant Wetlands
- Areas of Natural and Scientific Interest
- Significant Woodlands
- Fish habitat

The following summarizes these items based on the appropriate criteria and the field investigations results. For those that were deemed present, their significance was assessed, and avoidance and mitigation measures recommended.

5.1 Review of Project Activities

The proponent has put forth a re-development plan for the former old wooden mill that would see the construction of single dwellings. This project would result in the removal of the Cultural Meadow and portions of the Cultural Thickets, and of the Coniferous Cedar Forest (0.5 ha). It is noted that most of the areas being impacted have been previously disturbed by others (both the areas for the subdivision and for the proposed road alignment). The edge of the northern PSW habitat and the Mississippi river were demarcated on site and a 30 m setback from these is included. This will also protect the ANSI (which is associated with the northern PSW).

To construct the subdivision and associated infrastructure, the work activities needed would include:

1. Clearing of vegetation
2. Backfilling / Grading
3. Site development
4. Construction of stormwater management facility
    a. This is to be constructed outside of the 30 m setback from the northern PSW/river

   b. Consists of narrow swales with erosion protection and releases the water as sheet flow on the downstream end towards the PSW.
   c. Treatment is enhanced (80% TSS removal)
   d. Has been designed to avoid impacts from erosion
   e. Has been designed for the runoff rate to match the pre-development rates. There may be a slight increase.
5. Construction of road extension
   a. Will require the removal of 0.04 ha of the wetland as delineated on site.
   b. Abuts but does not touch the NMDNRF PSW layer.
   c. Road ditch water would be directed north through the stormwater management swale into the northern wetland.

5.2 Impact Assessment Methods

The assessment of the potential impacts is completed by analyzing the impact of various activities associated with the project. The significance of the potential impacts is measured using four different criteria:

1. Area affected may be:
   a. local in extent signifying that the impacts will be localized within the project area
   b. regional signifying that the impacts may extend beyond the immediate project area.

2. Nature of Impact:
   a. negative or positive
   b. direct or indirect

3. Duration of the impact may be rated as:
   a. short term (construction phase, 1-2 years)
   b. medium term (>2years)
   c. long term (>7 years).
   d. permanent

4. Magnitude of the impact may be:
   a. negligible signifying that the impact is not noticeable
   b. minor signifying that the project's impacts are perceivable and require mitigation
   c. moderate signifying that the project's impacts are perceivable and require mitigation as well as monitoring and/or compensation
   d. major signifying that the project's impacts would destroy the environmental component within the project area.

Where identified, the boundaries of any significant features are noted and the potential for the development to cause negative impacts is assessed. For those features which may be negatively impacted, avoidance and mitigation measures are recommended, as appropriate. The PPS states that a negative impact signifies:

> *"a) in regard to policy 2.2, degradation to the quality and quantity of water, sensitive surface water features and sensitive ground water features, and their related hydrologic functions, due to single, multiple or successive development or site alteration activities;*
> *c) in regard to fish habitat, any permanent alteration to, or destruction of fish habitat, except where, in conjunction with the appropriate authorities, it has been authorized under the Fisheries Act;*
> *d) in regard to other natural heritage features and areas, degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities."*

5.3 Evaluation of Potential Impacts of Potential/Known Natural Heritage Features

5.3.1 Endangered and Threatened Species

Terrestrial and wetland Endangered and Threatened Species at Risk, on private land, are protected under provincial *Endangered Species Act*. It is noted that bird species protected under the *Species at Risk Act* (SARA) are protected by the *Migratory Bird Convention Act* (MBCA) on private lands. Within this report, the acronym SAR refers to only Endangered or Threatened species. Special Concern species do not receive protection from ESA or SARA.

A list of potential SAR was compiled using various sources and identified up to roughly 5 km from the Site. The resulting list includes a total of 15 species were identified: 1 fish (American eel), 1 reptile (Blanding's turtle), 8 birds (least bittern, eastern whip-poor-will, chimney swift, loggerhead shrike, bank swallow, barn swallow, bobolink, eastern meadowlark), 4 mammals, all bats (little brown myotis, northern long-eared myotis and eastern small-footed myotis), 1 plant (butternut) (Table 7). Of these, many were determined not to be present or had no triggers for review based on guidance from the province. Table 7 notes the relevant MECP guidelines and triggers and indicates whether the species is brought forward for discussion.

Table 7: Summary of Potential Endangered and Threatened Species

Common Name	Scientific Name	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status	Preferred Habitat	Reference	Guidelines/Triggers for Review	Brought Forward (Yes/No)
FISH								
American Eel	*Anguilla rostrata*	S1?	END	No Status	Near cover over muddy bottoms in lakes, ponds, rivers and creeks at depths <15 m.	COSEWIC 2012	Habitat present within the adjacent lands but not within site. Low population size and may not be present. Education measures and measures to protect its habitat are included here.	Yes
REPTILES								
Blanding's Turtle	*Emydoidea blandingii*	SNR	THR	THR	Shallow water, large marshes, shallow lakes or similar such water bodies.	COSEWIC 2005	Species is listed within 2 km of the Site. Avoidance and mitigation measures are included herein. Review with MECP is required.	Yes
BIRDS								
Least Bittern	*Ixobrychus exilis*	S4B	THR	THR	Freshwater marshes, ditches, creeks, rivers and lakes with tall emergent vegetation.	COSEWIC 2009	No suitable habitat on site. The wetland and asetback of 30 m is protected. General breeding bird surveys did not record this species.	No
Eastern Whip-poor-will	*Antrostomus vociferus*	S4B	THR	THR	Rock or sand barrens with scattered trees, savannahs, old burns or other disturbed sites in a state of early to mid-forest succession, or open conifer plantations.	COSEWIC 2009	Species-specific surveys conducted and none were observed.	No
Chimney Swift	*Chaetura pelagica*	S4B, S4N	THR	THR	Cities, towns, villages, rural, and wooded areas. When selecting trees, they prefer those that are >50 cm in	COSEWIC 2007	No suitable structures on site. Breeding bird surveys conducted, and none were observed	No

Common Name	Scientific Name	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status	Preferred Habitat	Reference	Guidelines/Triggers for Review	Brought Forward (Yes/No)
					diameter and that are within 1 km of waterbodies.			
Loggerhead Shrike	*Lanius ludovicianus*	S2B	END	END	Loggerhead Shrike breeding habitat is characterized by open areas dominated by grasses and/or forbs, interspersed with scattered shrubs or trees and bare ground. Suitable habitat includes pasture, old fields, prairie, savannah, pinyon-juniper woodland, shrub-steppe and alvar.	COSEWIC 2014	No suitable habitat on site. Breeding bird surveys conducted, and none were observed	No
Bank Swallow	*Riparia riparia*	S4B	THR	THR	This species nests within vertical banks, with a preference for sand-silt substrate. Nesting sites may be near open upland habitats.	COSEWIC 2013	Breeding bird surveys conducted, and none were observed	No
Barn Swallow	*Hirundo rustica*	S4B	THR	THR	Open or semi-open lands: farms, field, marshes.	Peterson 1980, COSEWIC 2011	No suitable structures on site. Breeding bird surveys conducted, and none were observed	No
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR	Primarily in forage crops, and grassland habitat.	COSEWIC 2010	Habitat not suitable for species. Breeding bird surveys conducted, and none were observed	No
Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR	Fields, meadows and prairies.	COSEWIC 2011; Peterson 1980	Habitat not suitable for species. Breeding bird surveys conducted, and none were observed	No
MAMMALS								
Little Brown Myotis	*Myotis lucifugus*	S4	END	END	Buildings, attics, roof crevices and loose bark on trees or under bridges. Always roost near waterbodies.	Eder 2002	MECP recommends the use of avoidance timing window for clearing of trees (≥10 cm in diameter) if this can be accomplished then no impacts.	Yes
Northern Myotis	*Myotis septentrionalis*	S3	END	END	Older (late successional or primary forests) with large interior habitat.	COSEWIC, 2013; Menzel et al., 2002;		

Common Name	Scientific Name	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status	Preferred Habitat	Reference	Guidelines/Triggers for Review	Brought Forward (Yes/No)
						Broders et al., 2006; OMNRF, 2015	Avoidance measures included herein.	
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END		Found within deciduous or coniferous forests in hilly areas.	Eder 2002		
Tri-colored Bat	*Perimyotis subflavus*	S3?	END	END	Prefers shrub habitat or open woodland near water.	Eder 2002		
VASCULAR PLANTS								
Butternut	*Juglans cinerea*	S2?	END	END	Variety of sites, grows best on well-drained fertile soils in shallow valleys and on gradual slopes	COSEWIC 2017	Butternut survey conducted, none found (2014, 2016 or 2021). Surveys have a 2-year shelf-life. Avoidance measures included herein.	Yes

Status Updated: March 25, 2021

SRANK DEFINITIONS

S1 Critically Imperiled, Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2 Imperiled, Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3 Vulnerable, Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 Apparently Secure, Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S#S# Range Rank, A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

? Inexact Numeric Rank—Denotes inexact numeric rank

S#B Breeding

SARO STATUS DEFINITIONS

END Endangered: A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's ESA.

THR Threatened: A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC Special Concern: A species with characteristics that make it sensitive to human activities or natural events.

SARA STATUS DEFINITIONS

END Endangered, a wildlife species facing imminent extirpation or extinction.
THR Threatened, a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

American Eel

The American eel is listed as endangered provincially, but the species is not listed federally. The American eel breeds in the Sargasso Sea and matures in freshwater rivers in North America (including the Ottawa River) (Becker, 1983; MacGregor *et al*., 2013; Scott and Crossman, 1998). The freshwater eel population within Ontario has been declining since the 1980s (McGregor *et al.,* 2013). The eels migrate to the Ottawa River during the spring and migrate downstream during the fall, spending 5 to 20 years in freshwater (Becker, 1983; MacGregor *et al*., 2013; Scott and Crossman, 1998). Eels inhabiting the Ottawa River are generalist requiring structure (i.e., rocks, logs, undercut banks, vegetation) for cover. In the winter they are known to hibernate in mud. During electrofishing surveys, Bowfin has observed eels along both rocky and areas with soft substrate during nighttime sampling. American eels have historically been reported in the Mississippi River system, last observed in the Almonte to Appleton reach in 2011 (Community Stewardship Council of Lanark County 2012). Bowfin's surveys from this river have not found any individuals.

The habitat of American eels will not be impacted as there will be no in-water work. Any work in or within 30 m of the shoreline would be restricted to bank stabilization and revegetation programs. That said, eels can travel on land, when necessary and as such, avoidance measures have been included for this species (along with fish habitat in general under section 5.3.4).

Blanding's Turtle

Blanding's turtle is associated with a variety of shallow slow aquatic habitats with submergent and emergent plants and soft substrate (COSEWIC, 2016). Their preferred aquatic habitat is less than <2 m deep (ECCA, 2018). To err on the side of caution, depths less than 4.5 m are considered habitat for this species (ECCA, 2018). These turtles require basking sites located near the water such as exposed rocks or partially submerged logs. The nesting sites are located within areas of loose substrates varying from sand to cobblestone and may occur along roadways as far as 400 m away. Marsh habitat is important for the juveniles for protection from predators. The species overwinters within permanent water bodies (COSEWIC, 2016). This species can migrate far distances of up to 6 km (OMNR, 2013b). Migration routes can include overland movement.

The habitat guidelines for Blanding's turtle provide protection to the areas surrounding a nest, or perceived nest area. The level of protection varies with the distance from the nest and has been categorized by the province into three categories. These, along with their protection level are:

Category 1	Nest and the area within 30 m or Overwintering sites and the area within 30 m
Category 2	The wetland complex (i.e., all suitable wetlands or waterbodies within 500 m of each other) that extends up to 2 km from an occurrence, and the area

	within 30 m around those suitable wetlands or waterbodies
Category 3	Area between 30 m and 250 m around suitable wetlands/waterbodies identified in Category 2, within 2 km of an occurrence

There is one Blanding's occurrence within 2 km of the site making Appleton Swamp and its surrounding 30 m Category 2 habitat. Outside of the Mississippi River, the water depths in the northern and southern wetlands were too shallow to provide overwintering habitat. In this part of Ontario, a minimum depth of >50 cm is assumed for overwintering habitat based on ice thickness of up to 60 cm. There was no nesting habitat on site.

Avoidance measures are brought forward for this species and an assessment of the impacts to this species will be provided to MECP for review.

Least Bittern

The Least Bittern is listed as Threatened both federally and provincially signifying that it is likely to become Endangered if nothing is done to protect it. It breeds strictly in marshes of emergent that have relatively stable water levels and interspersed areas of open water. The Least Bittern is a secretive species which requires marsh habitats with dense vegetation (Sandilands 2005, COSEWIC 2001). This species tends to prefer to nest within cattail marshes usually along the edge or near openings (Woodliffe 2007). However, they have also been found to nest in bulrushes, grasses, horsetails and willow (Woodliffe 2007). The threats listed for the Least Bittern are the loss and fragmentation of wetland habitat, and recreational activities (Sandilands 2005).

Most of the wetland communities within the study area consisted of treed swamps with the exception of the small (<0.7 ha) marsh (cattail and purple loosestrife) community. There was no open water within this marsh. The portion of Appleton Swamp located within 120 m of the site does not contain the preferred habitat. Regardless, the proposed re-development will not occur within 30 m of the wetland or river. This species does not have regulated habitat protection or a *General Habitat Description*. The species was not observed during the breeding bird surveys in 2014. While it is considered unlikely to occur, impacts to its habitat (the PSW) have been avoided and no additional measures are required for the species itself (measures for breeding birds are included in general under 5.3.5).

Eastern Whip-poor-will

The whip-poor-will is a well camouflaged species can be found in a multitude of forest types. Its requirements consist of areas that are semi-open forests or sites with a closed forest intermixed with other open habitats. It also needs some areas with little ground cover. Its minimum habitat size requirement is typically around 9 ha (COSEWIC, 2009b). The G*eneral Habitat Description for Eastern Whip-poor-will* (MNRF on-line document) indicates that the protected habitat for

this species includes three categories:

Category 1	known nests and 20 m of the nest
Category 2	the area between 20 m and 170 m from the nest or the approximate centre of the defended territory
Category 3	the area of suitable habitat between 170 m and 500 m of the nest or approximate centre of the defended territory

Whip-poor-will surveys were completed in 2016 as per MNRF guidelines and none were heard or observed. A review of the on-line databases did not find any new occurrences in this general area since 2016. No whip-poor-will or its protected habitat is present.

Chimney Swift

The chimney swift can often be found in developed areas and prefers to utilize structures such as large (>50 cm diameter) trees or man-made structures such as chimneys for its nesting habitat (COSEWIC, 2007). The use of large trees is now considered a rare event and the documented occurrences have all be in trees that were <1 km from a waterbody (large enough to be shown on 1:50,000 topographical maps) (COSEWIC, 2007). No structures other than the existing house were present within the site. No chimney swifts were observed during the field visits. This species is considered absent.

Loggerhead Shrike

Loggerhead shrike is a small songbird that prefers pasturelands and shrubland with dense trees and shrubs and elevated perches. This species requires approximately 2.7 to 47 ha of suitable habitat depending on the density of shrubs, dense trees, and elevated perches within the habitat (COSEWIC, 2014; Environment Canada, 2015). This species prefers to nest in hawthorn trees within the Carden Plain and in red cedar within the Napanee plain. Our experience working with NDMNRF Kemptville was that loggerhead shrike surveys were only required when large tracks of hawthorn dominated thickets were present.

The *Loggerhead Shrike* G*eneral Habitat Description* (MECP, 2019b) indicates that the protected habitat for this species includes three categories:

Category 1	known nests and nesting tree and are within 200 m of nesting tree
Category 2	the area between 200 m and 400 m from the nesting tree
Category 3	not applicable

The site consisted primarily of a Cultural Meadow that was nearly 4 ha. The site does not contain the preferred habitat for this species and no individuals were observed within the project area during the breeding bird surveys. It and its habitat are considered absent.

Bank Swallow

Bank swallows are known to nest in vertical banks including those along riverbanks, and sand pits. The level of protection varies with the distance from the breeding colony. The G*eneral Habitat Description for Bank Swallow* (OMNRF, 2015c) indicates that the protected habitat for this species includes three categories:

Category 1	the bank swallow breeding colony, including the congregation of burrow sand the substrate between and around them
Category 2	the area within 50 m in front of the breeding colony bank face to allow bank swallow to enter and exit burrows
Category 3	the area of suitable foraging habitat within 500 m of the outer edge of the breeding colony

Three daytime breeding bird surveys were completed and no bank swallows or their nests were observed. This species is considered absent.

Barn Swallow

The barn swallow can often be found nesting on man-made structures. The G*eneral Habitat Description for Barn Swallow* (OMNRF, 2018b) indicates that the protected habitat for this species includes three categories:

Category 1	nest
Category 2	the area within 5 m of the nest
Category 3	the area between 5 m and 200 m of the nest

No structures will be removed for this project. No barn swallows were observed during the breeding bird surveys. This species is common and could forage in the area, but no nesting habitat is present.

Bobolink

This species is grassland-breeding-bird requiring a minimum of 4 ha of uncut meadow or field (McCracken, 2013). The *Bobolink* G*eneral Habitat Description* (OMNRF, 2018c) indicates that the protected habitat for this species includes three categories:

Category 1	known nests and 10 m of the nest
Category 2	the area between 10 m and 60 m from the nest or the approximate centre of the defended territory
Category 3	the area of continuous suitable habitat between 60 m and 300 m of the nest or approximate centre of the defended territory

Grassland breeding bird surveys were completed as per the provincial protocol, and none were observed. This species is considered absent.

Eastern Meadowlark

Like the bobolink, this species is grassland-breeding-bird requiring a minimum of 4 ha of uncut meadow or field (McCracken, 2013). The *general Habitat Description for the Eastern Meadowlark* (OMNRF, 2018d) indicates that the protected habitat for this species includes three categories:

Category 1	known nests and 10 m of the nest
Category 2	the area between 10 m and 100 m from the nest or the approximate centre of the defended territory
Category 3	the area of continuous suitable habitat between 100 m and 300 m of the nest or approximate centre of the defended territory

Grassland breeding bird surveys were completed as per the provincial protocol, and none were observed. This species is considered absent.

Bats

The potential SAR bats within the general area are little brown myotis, northern myotis, eastern small-footed myotis and tri-colored. There are three types of habitats required by bats: hibernation, maternity sites, and day-roost sites. The latter is not considered critical habitat.

These four bats species prefer to hibernate in caves or mines. They can hibernate in buildings but that is rare for these species (COSEWIC, 2013a). No caves or mines were present.

The recovery strategy for the eastern small-footed myotis indicates that the preferred maternity habitat of this species consists of open rock habitats and that it rarely uses old buildings as roosting/maternity sites (Humphrey, 2017). There was no rocky habitat present and no buildings within the sites searched. Based on this information, this species' maternity sites are considered absent.

The Atlas of Mammals of Ontario (Dobbyn, 1994) suggests that the tri-colored bat is not present within this part of Ontario however, the NatureServe mapping in the COSSARO (2015) includes all southeastern Ontario. Based on this information, this species is considered to have a very low potential of occurring.

The northern myotis tends to prefer larger expanses of older forests (late successional or primary forests) and choose maternity sites in snags that are in the mid-stage of decay. They prefer habitat with intact interior habitat and is shown to be negatively correlated with edge habitat

(Menzel et al., 2002; Broders et al., 2006; Yates et al., 2006; OMNRF, 2015a). There was no woodland interior within the site. As such, the preferred habitat was not present, and this species is considered unlikely to have maternity sites here.

The little brown myotis is one of the few bat species that can use anthropogenic structures as maternity sites. Potential suitable structures can include buildings, bridges, barns, and bat boxes. The little brown myotis can also use tall, large cavity trees that are in the early to mid-stages of decay as maternity roosts, as well as loose/raised tree bark, and/or crevices in cliffs (ECCC, 2018). This bat species occurs in higher densities in mature deciduous and/or mixed forests due to increased opportunities for large snags. However, unlike the northern myotis, the little brown myotis does not exclusively require mature forest stands in order to find appropriate maternity roosts (COSEWIC, 2013a). There are no buildings within the Site however the wooded area to the west could provide habitat for this species.

There also remains potential for bats, in general, to use the cavity tree in the adjacent lands for day-roosting. Day-roosts are not considered critical habitat and impacts to the bats can be minimized by removing the trees outside of the day-use period. Mitigation measures are included below.

Butternut

Butternut is listed as an endangered species federally signifying that it is at risk of becoming Extinct or Extirpated in Ontario and in Canada. Butternut is a shade intolerant species that is often found along edge habitats on rich, moist, well-drained loams or well-drained gravels (COESWIC, 2003). The butternut is threatened by a canker for which there is no known control (COESWIC, 2003). Butternuts are assessed based on the amount of canker (the disease which is killing the species), their size and health, as per the current provincial protocol. This method classes the individual trees as one of three categories:

Category 1 are those that are heavily infected to the point that they are not expected to survive.
Category 2 may have some canker but are still considered healthy.
Category 3 are the same as Category 2, but these are larger individuals situated near heavily cankered trees and province believes that some may be showing immunity to the disease.

A survey for Butternuts was completed 2014, and 2016 and again on September 1, 2021. None were found. Note that September 1 is one day after the assessment period, but does not preclude the inventories and further, no frosts had occurred prior to September 1, 2021. This species is absent from the study area. However, it has been brought forward because the surveys have a limited 2-year shelf life. In this instance, a butternut inventory (and assessment if present) would

need to be completed if the vegetation is not cleared prior to August 31, 2023.

SAR Mitigation Measures

General:

- Endangered and threatened species are protected and cannot be harmed, harassed, or killed and in some cases their habitats are also protected. These individuals will only be handled by qualified person and only if the individual is in imminent threat of harm. An authorization under the ESA 2007 would be required to handle individuals that are not in imminent threat of harm.
- If a SAR enters the work area during the construction period, any work that may harm the individual is to stop immediately and the supervisor will be contacted. No work will continue until the individual has left the area.
- Should an individual be harmed or killed then work will stop, and the Ministry of Environment, Conservation and Parks (MECP) will be contacted immediately (sarontario@ontario.ca).
- Educate staff and contractors on the potential for SAR to be in the area and their significance.
- Mitigation measures listed elsewhere in this report are also applicable to this section.
- If a SAR is encountered, this information will be provided to the Natural Heritage Information Centre (Report rare species (animals and plants) | ontario.ca).

SAR Turtles: As noted herein, Blanding's Turtles are reported to be present within 2 km of this site.

Construction:

- During construction, temporary turtle exclusion fencing will be installed around the west, north and south sides with turn-arounds along both ends. *Reptile and Amphibian Exclusion Fencing: Best Practices* (OMNR, 2013d) will be followed for exclusion fence design.
- The temporary fencing can consist of sediment fencing that is properly countersunk and maintained.
- Plan on installing the exclusion fence and clearing vegetation for its installation outside of the active turtle season [i.e., clear after October 16 (or freeze up) and before April 15 (or spring thaw)]. **Note that the timing constraint for tree removal is more restrictive as it follows the bat window (no clearing between April 1 and September 30, inclusive).**
- Educate construction workers of the potential for Blanding's Turtle to be present and is a species protected from harm and injury under the provincial *Endangered Species Act*.

Ensure to inform workers that there is a high potential for the species to occur in this area and that it is known to migrate long-distances over land.

- A speed limit of 15 km/h is recommended for vehicles used during construction or to access the stormwater management facility. The speed limit is to be posted.
- Additional fencing is recommended around any stockpiles that might provide suitable nesting substrate (i.e., gravel, soil) to help prevent turtles from nesting in the work area. Note that should suspected Blanding's Turtle nesting occur, the work that could impact this habitat is to be shut down and consultation with a biologist with experience with this species or with MECP would be required for guidance. It is imperative that the temporary exclusion fence and this additional fencing be maintained to prevent use of areas disturbed by construction, for nesting.
- If a turtle is observed, then all work that may harm the individual must stop and the worker should notify their supervisor. Try to take a photograph but do not chase the turtle in order to do so.
- Turtles encountered on-site cannot be harmed or harassed.
- Turtles should be allowed to leave the area on their own.
- It is also important that the individual be watched, from afar, to ensure that it does not enter an area where it may come to harm.
- If an individual has been impacted, the supervisor should contact MECP (and if applicable the project biologist) immediately.

Operations:

- Following construction, a permanent turtle exclusion will be installed around the west, north and south sides with turn-arounds along both ends, with details to be confirmed through discussions with MECP. *Reptile and Amphibian Exclusion Fencing: Best Practices* (OMNR, 2013d) will be followed for exclusion fence design. However, in some areas a retaining wall may be used. The wall is to have a minimum vertical face of 60 cm. A cross-section of its design would be provided to MECP for review by the time of registration.

Area	**Nature**	**Duration**	**Magnitude**
Local	Negative Direct	Permanent (removal of 0.04ha of wetland) Temporary (works within Category 2 and 3 Habitats)	To be confirmed through discussions with MECP.

SAR Birds: Both daytime and nighttime breeding bird surveys were completed. No SAR birds were present. No other SAR birds were identified as nesting or likely to nest.

- No impacts to federal SAR bird nests, or their eggs is permitted under the federal *Species at Risk Act*. If a federally listed bird species at risk nest is encountered, then work must stop until the young have fledged. If the nest/young have been harmed, then Environment Canada must be notified immediately for guidance.
- No impacts to provincial SAR bird nests or their eggs is permitted under the provincial *Endangered Species Act*. If a provincially listed bird species at risk is encountered, then work must stop and MECP contacted (sarontario@ontario.ca).
- Should a nest be discovered, stop all work that may disturb the birds (i.e., that cause the adults to fly off the nest) and contact a biologist or MECP or Environment Canada, as appropriate for the species.
- For birds, vegetation should be cleared after August 28 and prior to April 1. However note that the restrictions for removal of trees due to bat is more conservation (see below). If the timing window cannot be adhered to for the removal of the cultural meadow, then nesting surveys could be completed. This is not recommended for trees other than windrows where it is reasonable to confirm lack of nests (without having a false positive). But this would also require additional surveys for bats (see below).

Area	**Nature**	**Duration**	**Magnitude**
Local	Negative Direct	Permanent (removal of vegetation)	Unlikely to occur do to existing land practices. Timing constraint should be adhered to otherwise implement additional measures.

Bats: It is understood that most vegetation will be removed from the site. The potential to impact SAR bats would be restricted to day-roosts for most species, with a higher potential for little brown myotis in the forest. Recent discussions with MECP on these species indicate that they do not need to be approached if the timing window below can be adhered to.

- Educate contractors by informing them that most bats in Ontario are protected.
- **Remove all trees that are 10 cm in diameter at breast height or larger (in the fencerows or forest) between October 1 and March 31 (Bat active season is currently assumed to be April 1 to September 30).** If this is not possible, conduct exit survey prior to cutting them down. If the exit survey identifies bats, contact MECP or biologist for additional guidance.

Area	Nature	Duration	Magnitude
Local	Negative Direct	Permanent (removal of trees)	Low potential (since no hibernacula are present and it is anticipated that all trees > 10 cm will be removed during the timing window)

Plants: No SAR (Endangered or threatened) were present in or within 50 m from the site. However, the butternut inventory is only valid until August 31, 2023. After that date, a new survey would need to be undertaken. Also, note that if a butternut was missed, then it would need to be assessed prior to working within 50 m of that individual.

Avoidance/Mitigation Measures for Butternuts:

- Should butternuts be identified then these will need to be assessed and the appropriate actions taken.
- If vegetation is not cleared prior to August 31, 2023, then the inventory may need to be repeated.

5.3.2 Provincially Significant Wetlands/ANSIs

The background review indicated that Appleton Swamp is a PSW and a candidate ANSI. There were two wetland areas referred to as the northern and southern wetlands. The ANSI is associated with the northern wetland. The edge of the wetland community within the site and along the road allowance was delineated during the field work. The change from terrestrial to wetland is abrupt and easily distinguished in the field due to the presence of steep banks, hills and the berm.

Northern Wetland

For the northern wetland and ANSI, the proposed redevelopment will not occur within 30 m of the PSW / candidate ANSI Appleton Swamp and as such there will be no direct impacts to these features. The new boundary of the PSW was approved by NDMNRF (email dated June 27, 2016). This northern wetland consists of a treed swamp and marsh community. These types of habitat provide:

- wildlife habitat and water supply and purification (surface water treatment and groundwater discharge and maintenance of flow regime).
- They can also provide flood control.
- The open water, within the river, can provide habitat for waterfowl breeding, rearing, and moulting.
- Portions of the northern Appleton Swamp near the Mississippi River would provide direct fish habitat.
- Portions of the northern wetland, especially along the Mississippi River would provide turtle habitat.

The sensitivity of the northern wetland was identified early on in the process and an agreed to setback of 30 m from the wetland was established. Within this setback, activities such as grading would occur (setback is currently heavily disturbed) but once grading was completed, it would be revegetated with suitable native species.

Normal avoidance and mitigation measures, listed below, would be sufficient to protect this feature and its functions.

Summary of Impacts to Wetlands, Avoidance and Mitigation Measures for wetlands (PSW and unevaluated)

- A 30 m setback has been established for the northern PSW.
- No direct impact to the northern PSW will occur, unless as part of an approved offsetting plan.
- Indirect impacts could occur as a result of change in water supply or quality, sediment/erosion of the wetland.
    - The water quality and quantity going to each wetland may have a slightly higher release rate but will remain similar pre and post-construction.
    - Water quality is to have an enhanced water treatment level (80% TSS removal).
    - The outlets from the stormwater management are to be designed to prevent erosion and the transport of suspended sediments into the wetland.
    - It is noted that the vegetation within the marsh next to the berm in the PSW is impacted with some upland species growing. Directing the overland flows to this area could be beneficial in encouraging the wetland plants to re-establish.
    - Appropriate measures will be implemented along the slopes to ensure that no erosion occurs (erosion could result in the transportation of soil down into the wetland).
    - During construction, an appropriate erosion and sediment control strategy will be developed, installed, monitored, and maintained. This will include, at a minimum, the installation of sediment fence (countersunk) along the edge of the limit of disturbance.
- Grading in areas that drain towards the wetland or river should be timed to avoid periods of high runoff volumes (such as the periods of heavy rainfall associated with spring and fall periods). Contractor is to be cognisant of the potential for large areas of bare soil to result in negative impacts through the transportation of sediment to the wetland and river, and employ additional preventative measures as required.
- Any stockpiles of soil or fill material would be stored at least 30 m from the slope and protected by silt fencing.
- Additional materials (*i.e.,* rip rap, filter cloth and silt fencing) should be readily available in case they are needed promptly for erosion and/or sediment control.

- Erosion and sediment control measures need to be maintained and will require daily inspection to ensure that they are working as intended. Additional inspections will be required after rainfall or storm events.
- The sediment fencing would not be removed until the site is stable.
- Any outlet or drains will be constructed to ensure that no erosion of the soil occurs (to prevent erosion and the transportation of sediments into the wetland).
- No additional access to the wetland will be created (no trails).
- No changes in light or noise impacts are anticipated. No removal of vegetation in the wetland will occur. The noise from the existing houses and rows are anticipated to be similar post-construction (only 14 large lots being developed).
- The current lands within the 30 m buffer on the east side consists of a berm. It would be beneficial to remove the berm and grade the lands to allow for sheet flow into the wetland. The 30 m lands could then be re-naturalized with native vegetation (including trees and shrubs).

Southern Wetland

The edge of the southern wetland boundary classed as a PSW on the provincial mapping abuts the edge of the road allowance but does not cross it. However, strictly following the OWES protocol for the delineation of wetland boundaries found that the road allowance contained more than 50% cover by wetland plants. And thus, unevaluated wetland habitat is present on the road allowance. The wetland habitat to be impacted by the road allowance is 0.04 ha. The loss of the small portion of wetland habitat is not anticipated to have a measurable impact on the functions of the southern wetland because:

- The portion to be removed for the road allowance is the tip. The construction of the road allowance will not fragment the wetland itself.
- Historical impacts (infill, mowing) of the road allowance resulted in low quality wetland habitat.
- No continuous surface water in road allowance (appears that someone excavated a little area with a shovel but this pocket (few metres) of water was isolated and the direct result of this excavation.
- No channels or carving of soil was present in this area.
- Not connected to the northern Appleton wetland through this site. It is unknown if this wetland is connected to the northern wetland through the golf course or to the Mississippi River through the lands to the south (private lands). But the lack of fish during sampling suggests that this could be an isolated wetland.
- Portion to be removed did not provide amphibian, fish, wetland bird habitat. It did not provide turtle overwintering habitat.

The southern wetland, south of the road allowance (>5m south) becomes a more functional wetland with a permanent channel and obligate wetland vegetation. It was in this area that

amphibians were observed during the amphibian breeding visits. This area could also provide turtle habitat, though the water depths in the summer were only 20 cm (so unless deeper areas are present, then it would not be overwintering habitat). Fish community sampling did not find any fish, as noted above, this is suggestive that the wetland is isolated.

The removal of the 0.04 ha of edge habitat is not anticipated to have a measurable direct impact to the wetland functions of the southern wetland, and this area is outside of the NMDNRF mapped PSW. Indirect impacts could occur due to changes in the water quality or quantity. This was reviewed with the team. Because of the topography, the water from the road ditch will be moved to the northern wetland, instead of the southern wetland. This is a tradeoff in terms of a small loss of water into a portion of the wetland that was dry, even during the early spring visit of 2022, and water quality. Roadways are associated with the introduction of salt (from winter road maintenance) to wetlands. The water will still end up in the northern wetland but only after having passed through the stormwater management swale which would help mitigate the presence of road salts. It is also understood that the road maintenance within this municipality consists of a mixture of sand and salt (reduced amount of salt).

The edge of the new road will remove 0.04 ha of unevaluated wetland that abuts an identified PSW. While this area to be impacted was not considered to be of high value, its removal is a permanent impact and offsetting is recommended.

Summary of Impacts to Wetlands, Avoidance and Mitigation Measures for wetlands (PSW and unevaluated)

- The construction of the road extension is to be cognisant of the southern wetland and look for ways to minimize the footprint of direct impact. The maximum impact is estimated at 0.04 ha.
- Flow reduction to the southern wetland will be minimal. But it will provide opportunity for enhanced water treatment of the road ditch via the stormwater management swale.
- Water from the road ditch will be moved north under the roadway through a 600 mm CSP culvert.
- Grading in areas that drain towards the wetland should be timed to avoid periods of high runoff volumes (such as the periods of heavy rainfall associated with spring and fall periods). Contractor is to be cognisant of the potential for large areas of bare soil to result in negative impacts through the transportation of sediment to the wetland, and employ additional preventative measures as required.
- Indirect impacts could occur as a result of change in water supply or quality, sediment/erosion of the wetland.
    - The water quality and quantity going to each wetland is to remain similar pre- and post-construction.

    - During construction, an appropriate erosion and sediment control strategy will be developed, installed, monitored, and maintained. This will include, at a minimum, the installation of sediment fence (countersunk) along the edge of the limit of disturbance.
- Any stockpiles of soil or fill material would be stored at least 30 m from the slope and protected by silt fencing.
- Additional materials (*i.e.,* rip rap, filter cloth and silt fencing) should be readily available in case they are needed promptly for erosion and/or sediment control.
- Erosion and sediment control measures need to be maintained and will require daily inspection to ensure that they are working as intended. Additional inspections will be required after rainfall or storm events.
- The sediment fencing would not be removed until the site is stable.
- No additional access to the wetland will be created (no trails).
- No changes in light or noise impacts are anticipated. No removal of vegetation in the wetland will occur. The noise from the existing houses and rows are anticipated to be similar post-construction (only 14 large lots being developed).
- The current lands within the 30 m buffer on the east side consists of a berm. It would be beneficial to remove the berm and grade the lands to allow for sheet flow into the wetland. The 30 m lands could then be re-naturalized with native vegetation (including trees and shrubs).

Area	Nature	Duration	Magnitude
Local	Negative Indirect	Short to Medium Term depending on extent	Loss of 0.04ha of unevaluated wetland habitat.

Offsetting Measures

It is noted that the following are examples of offsetting measures that could be completed. The details of an offsetting plan will need to be developed following consultation with MVCA, DFO and MECP since the location of the proposed offsets would be the northern wetland. The purpose of listing some examples of works that could be undertaken is to demonstrate that there is ample room for improvements. The offsetting plan would be a separate document prepared by the time of registration.

- The length of adjacent lands to the northern wetland and the Mississippi River within the subdivision site is roughly 320 m. Of which most is impacted from fill. Portions of this area could be revegetated with native trees, shrubs and herbaceous species. The elevation could be lowered to be more favorable for view points. This would also help discourage land owners from removing trees to create vantage points.

- The marsh habitat next to the berm is impacted with terrestrial species and did not contain surface water. Pools could be built here in the range of 0.03-0.06 ha. These could be designed to be offline but sufficient in depth (i.e., >50cm) to create amphibian and overwintering habitat for turtles. Keeping the pools offline would prevent fish from accessing them.

5.3.3 Woodlands

The PPS does not permit development in significant woodlands south and east of the Canadian Shield unless it has been demonstrated that there will be no negative impacts on the natural features or the ecological functions. A woodland is defined as a treed area, woodlot or forested area. For the purposes of this report, a woodland included any community that was described as a treed swamp (deciduous, coniferous or mixed) or forested. The deciduous treed swamp and dry-fresh white cedar coniferous forest form part of a large forest which continues off-site to the west and south. To determine if this woodland is significant, the criteria presented in the NHRM: size, ecological function, uncommon characteristics and economical and social functional values. If the woodland meets any one of these criteria then it is deemed to be significant.

Woodland Size

The forest stand is 95 ha of which ±1 ha is located within the site (Figure 15). Based on the forest cover of approximately 43% (Lower Mississippi – MVCA *Mississippi Valley Watershed Report Card* 2013) any forest stand that is ≥ 50 ha should be considered significant. The forest within the site is considered significant in terms of size.

Ecological Functions Criteria

This criterion is based on five factors. The patch meets all but the woodland diversity criteria (Table 8).

Table 8: Presence/Absence of Woodland Ecological Functions

Factor	Comments/Rational	Meets Minimum Requirements	Meets Minimum Requirement After Clearing
Woodland interior (includes all forest located at least 100 m from the woodland's perimeter) Minimum size – 8 ha	There is a large (42 ha) forest interior none of which falls within the site (Figure 15 and Figure 16). The removal of the 0.5 ha on site does not alter the size of the interior habitat.	Yes	Yes

Factor	Comments/Rational	Meets Minimum Requirements	Meets Minimum Requirement After Clearing
Proximity to other woodlands or other significant natural heritage features	This woodland includes a portion of the Appleton PSW	Yes	Yes
Linkages	The forest patch is located between several woodlands (Figure 15).	Yes	Yes
Water protection	The Mississippi River is found along the north edge of the woodland and additional watercourses are identified by Ontario Base Mapping as occurring within the woodland but outside of the site.	Yes	Yes
Woodland diversity	Within the site, this stand did not contain any declining natural communities or a high variety of native diversity through composition or terrain. No woodland plants with a cc value of 8, 9 or 10 were documented except for the planted jack and red pine found in the fencerow of the adjacent lands. The woodland within the site did not meet the larger individual criteria (i.e. >10 trees / ha with a min DBH of 50cm or a basal area of 8 or more m^2/ha of trees with a min DBH of 40 cm)	No	No

Figure 15: Delineation of Forest Patch (based on PPS and desktop exercise, ground truthed within the site)

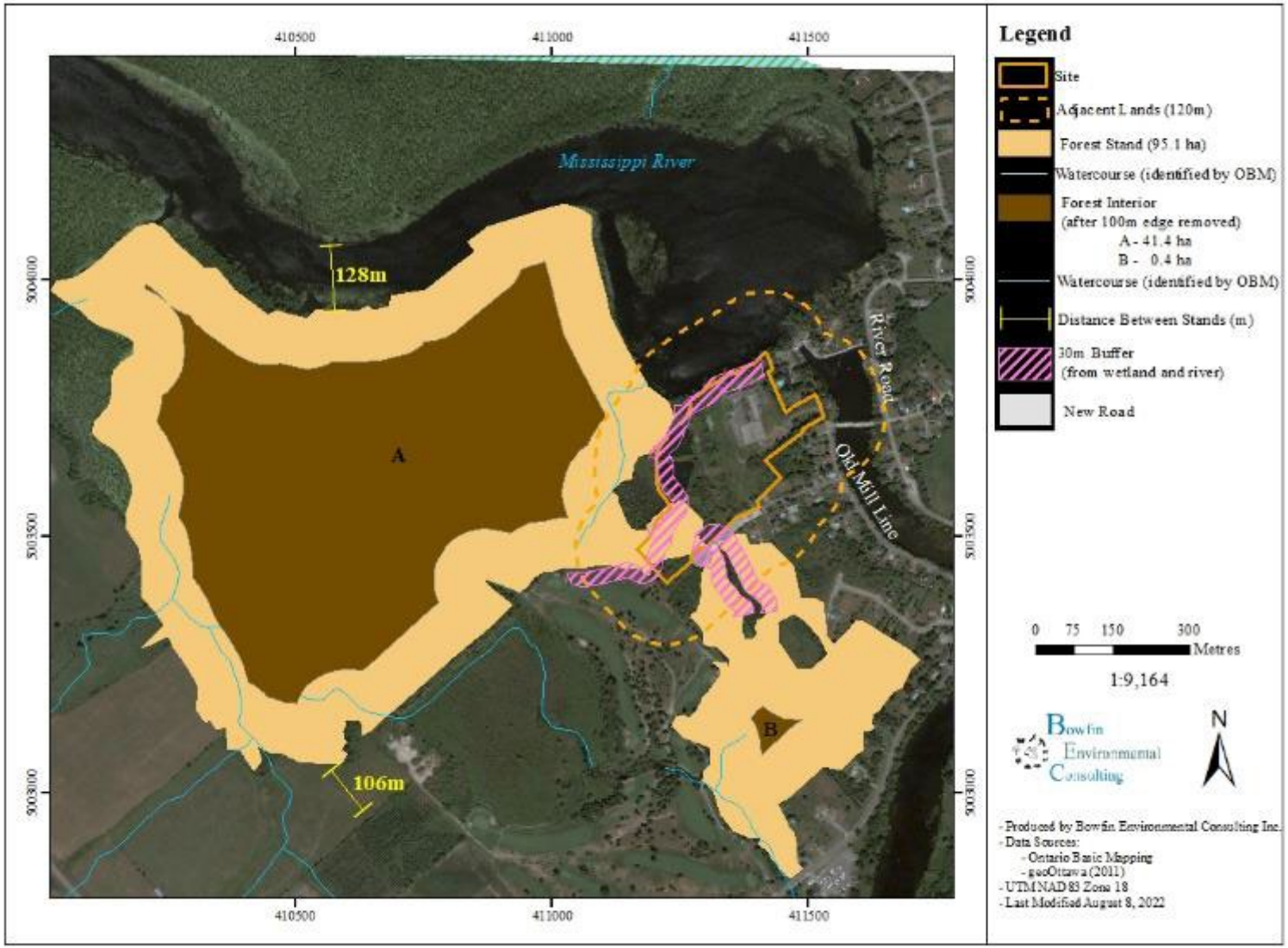
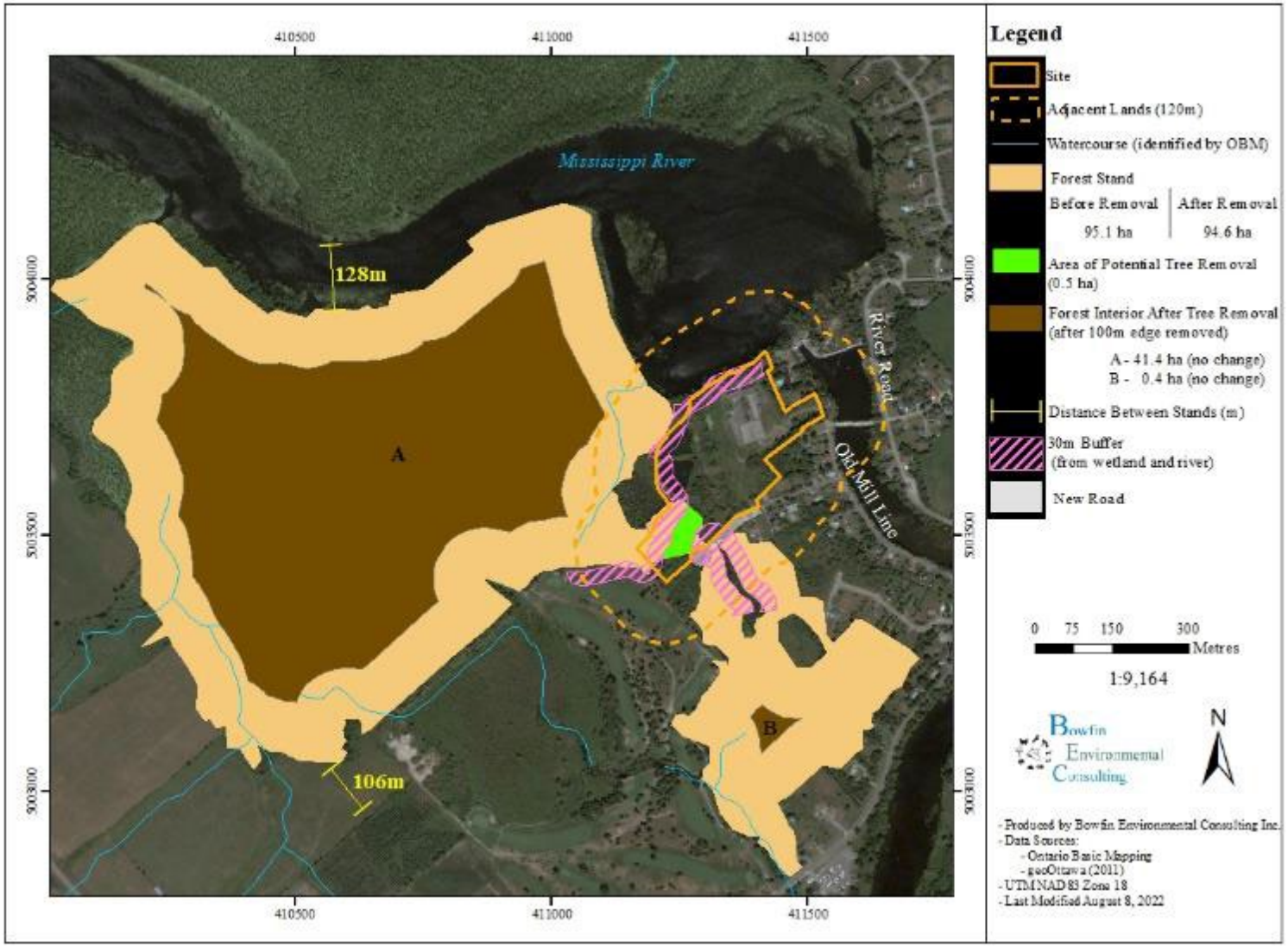


Figure 16: Delineation of Forest Patch Showing Forest to be Removed



Uncommon Characteristics

This criterion refers to woodland stands that are considered uncommon based on the composition, cover type, age or structure. Based on the information available in the *Significant Wildlife Habitat Technical Guide Appendix M* there are no rare plant communities found within the site. There were also no vascular plant species with a CC value of 8, 9 or 10, tree species of restricted distribution or limited coverage in the planning area. There are also no communities dominated by old or large trees. Much of the site has been historically altered by selective harvesting, construction of access roads and sand removal.

Economic and Social Functional Values

This site is not known to have a significant economic or social function.

Summary

The woodland associated with the site is significant woodlands based on its size and ecological functions. Of the ecological functions, it provides all but the woodland diversity.

Avoidance and Mitigation Measures

The proposed redevelopment will occur outside of the woodland stand except for possibly a small (±0.5 ha) footprint in the south. The removal of this small area will not affect any of the significant functions of this woodland (no measurable impact on the size, zero impact on the size of the interior habitat and consists the removal of young cedar trees). The potential indirect impacts on the significant woodland are discussed in Section 6.0.

- The edge of the lands to be cleared of vegetation will be clearly delineated on the site plans and in the field. In the field, the edge should be placed outside of the drip line of the outer row of trees;
- To protect the individual trees from harm:
    - Sturdy fencing will be installed outside of the drip line of the trunk of the closest trees to the work area.
    - No grading or activities that may cause soil compaction (such as heavy machinery and stockpiling of materials) will be allowed within the fenced area.
    - Furthermore, no machinery maintenance or refueling or stockpiling is permitted within 5 m of the outer edge of this fencing.
    - Exhaust fumes from all equipment will be directed away from the canopy of the trees to be retained.
    - If roots of trees, on adjacent lands become exposed during site alterations, they will be buried immediately with soil or covered with filter cloth or woodchips and kept moist until the roots can be buried permanently.
    - Any roots that must be cut will be cut cleanly to allow for healing.

- No signs, notices or posters should be attached to any trees;
- **The removal of trees is to occur between October 1 and March 30. This is to avoid both the active bat season and the breeding bird season (see timing and measures from sections above and below).**
- The landscaping plan will include the planting of native species as much as possible various species could be used (i.e. sugar maple, basswood, white cedar, red maple, bur oak, white spruce, white pine).
- Landowners will be made aware that the trees within the 30 m setback serve an important function in terms of bank stability and are not to be removed.

5.3.4 Fish Habitat

The potential fish habitat is restricted to the wetlands and the Mississippi River. The northern wetland and the Mississippi River will not be directly impacted. However, there is a potential for regrading within 30 m of the edge (slope stability, and re-naturalising parts of the 30 m buffer). The portion of the southern wetland that will be impacted by the road, is not direct fish habitat. These activities could create indirect impacts. At this time, the only work below the high-water mark (with respect to fish habitat) is that which could be included for offsetting measures for the impacts to the southern wetland and Blanding's Turtle habitat for the road. Again, while the southern wetland encroached through the road alignment, this part of the wetland was delineated as per OWES, on the vegetation, and there was not direct fish habitat. The work activities for the subdivision and the infrastructure are not anticipated to cause direct impacts to fish or fish habitat. However, as is noted further below under the wetland section, offsetting measures may be implemented in the northern wetland. Once more details of the offsetting plan have been determined, considerations for fish and fish habitat will be reviewed and Fisheries and Oceans Canada (DFO) contacted as needed by the time of registration.

Planning

- The minimum setback of 30 m from the direct fish habitat of the northern wetland and Mississippi River has been established. It is important that any future landowners be made aware that they are not to disturb this buffer.
- If grading or disturbances to the soil is needed within this 30 m buffer, the appropriate erosion and sediment control measures will be implemented to prevent turbid runoff from reaching downstream fish habitat.
- The stormwater management facility design consists of narrow ponds that lead towards the wetland, but that do not encroach into the 30 m buffer. It is understood that the flow will consist of sheet flow directed into the marsh community.
- Any private septic treatment systems are to be designed and installed as appropriate, outside of the setbacks.
- Clearly demarcate work areas and the geotechnical setback in the field.

- The fish habitat setbacks will be vegetated. Where possible, leave existing vegetation and add native woody shrub and tree species (where woody vegetation is lacking) and use native vegetation for the re-naturalizations.

Erosion and Sediment Control

- To protect the valley bank, sturdy fencing will be placed to the north of the geotechnical setback prior to any work in the area.
- An erosion and sediment control plan will be developed by contractor and implemented prior to any work within 30 m of any valley/aquatic feature.
    - Provide regular maintenance to the erosion and sediment control measures during construction. Contractor shall be responsible for ensuring that the erosion and sediment control measures are maintained and will monitor the water clarity downstream of the work site throughout the day and during rain events. Water quality is to meet the *Canadian Water Quality Guidelines for the Protection of Aquatic Life*. Monitoring for visible plumes outside of the work area is to be undertaken.
    - At a minimum, the erosion and sediment control plan will include the installation of sediment fencing along the top of banks where vegetation clearing and/or soil disturbance will occur within 30 m of any channel prior to the removal of vegetation and measures to prevent turbid water from entering downstream fish habitat. It is noted that this fence is also to serve as the temporary turtle exclusion fence.
    - Additional materials (*i.e.* rip rap, filter cloth and silt fencing) will be readily available in case they are needed promptly for erosion and/or sediment control.
- The proper erosion and sediment control measures are installed and maintained prior to any clearing of vegetation within **30 m** of the watercourse and until the banks are stabilized (>80% revegetated).
- Any stockpiles of soil or fill material will be stored as far as possible from the channel and protected by silt fencing (minimum 30 m).
- The sediment fencing will not be removed until the bank is stabilized (i.e. >80% revegetated or covered with an erosion control blanket).
- All equipment working within 30 m of the water will be well maintained, clean and free of leaks.
- Suspend any activities that cause muddy environments during periods of heavy rains.

Fish and Fish Habitat Protection

- At this time, it is understood that there will be no work below the high water mark. As such, unlikely to cause death of fish. It is noted that the American Eel can travel on land and contractors should be made aware. The sediment fence can also serve to keep American Eels out of the work area.

Contaminant and Spill Management

- Machinery entering the work area should be free of mud to minimize the introduction of invasive plant species.
- All equipment working in or near the water should be well maintained, clean and free of leaks. Maintenance on construction equipment such as refueling, oil changes or lubrication would only be permitted in designated area located at a minimum of 30 m from the shoreline in an area where sediment erosion control measures and all precautions have been made to prevent oil, grease, antifreeze or other materials from inadvertently entering the ground or the surface water flow.
- Emergency spill kits will be located on site. The crew will be fully trained on the use of clean-up materials to minimize impacts of any accidental spills. The area would be monitored for leakage and in the unlikely event of a minor spillage the project manager would halt the activity and corrective measures would be implemented. Any spills would be immediately reported to the MECP Spills Action Centre (1800 268-6060).
- No construction debris will be allowed to enter the watercourse.
- Following the completion of construction, all construction materials will be removed from site.

Activity	Area	Nature	Duration	Magnitude
Grading and planting within the 30 m buffer	Local	Indirect Neutral to Positive	Permanent	Minor (positive)

5.3.5 Other

The measures outlined above serve to protect the identified or potentially present natural features identified in the background review and/or site investigations. However, there are also some other items that should be mentioned.

1. Almost all birds in Ontario are protected by either MBCA or FWCA.
2. Most reptiles are protected by the FWCA.

Mitigation Measures:

- Almost all breeding birds are protected under the MBCA and/or FWCA. The only species not protected are: American crow, brown-headed cowbird, common grackle, house sparrow, red-winged blackbird, and starling. It is prohibited to destroy or disturb an active nest of other birds, or to take or handle nests, eggs, or nestlings. In this part of Ontario, the current standard nesting period is between **April 5 to August 28**. Outside of this timing window, it is considered unlikely that birds would be nesting. Note, there are some birds (birds of prey,

herons etc.) that do begin nesting earlier in the year. It should also be noted, that if an active nest is present before or after the above dates that it is still protected. These dates only serve as a guideline.

- During construction, there is a potential for suitable habitat for ground nesting birds (i.e. killdeer) to be created. These include bare soil or gravel areas. Perform regular walks of the cleared areas looking for ground nesters. If any are present, the contact a biologist for guidance.
- Work during the daytime hours to prevent light disturbances.
- Ensure that all equipment have the appropriate mufflers to reduce noise disturbances.
- If a turtle nest is suspected, then flag a 10 m buffer to protect the nest. Contact MECP (for SAR) and MNRF (all other species).

5.3.6 Accidents and Malfunctions

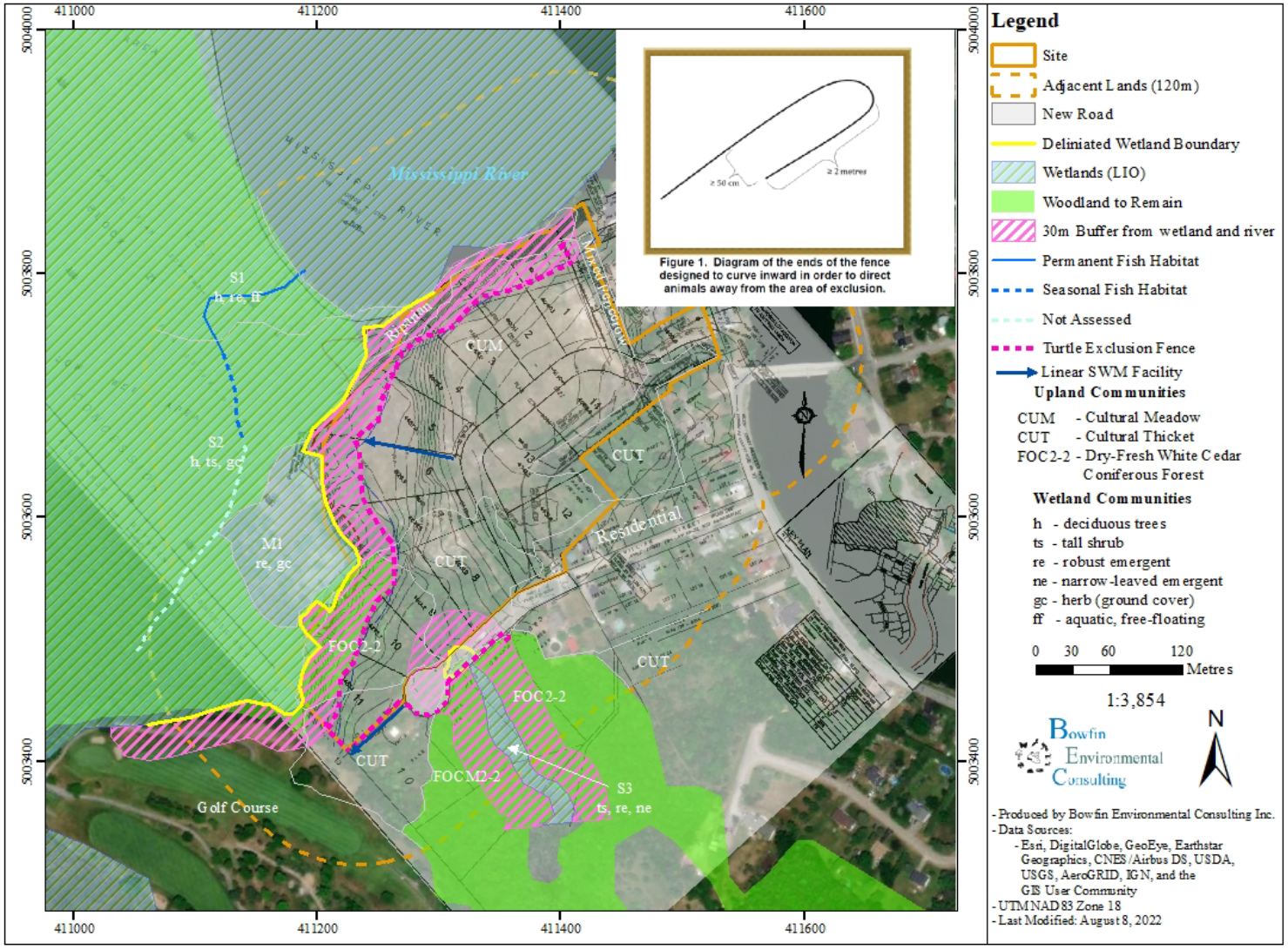
Although the likelihood of accidents and malfunctions occurring would be minimized by following the mitigation measures outlined below, should accidents and/or malfunctions occur they have the possibility of presenting serious impacts and require consideration.

Maintenance on construction equipment such as refueling, oil changes or lubrication would only be permitted in designated area located at a minimum of 30 m from the natural areas to be retained. And in an area where erosion and sediment control measures and all precautions have been made to prevent oil, grease, antifreeze, or other materials from inadvertently entering the ground or the surface water flow.

Machinery should be cleaned prior to arriving on-site to prevent the potential spread of invasive species (i.e., mud and vegetation matter from other sites should be removed from machinery).

Emergency spill kits would be located on site. The crew would be fully trained on the use of clean-up materials in order to minimize impacts of any accidental spills. The area would be monitored for leakage and in the unlikely event of a minor spillage the project manager would halt the activity and corrective measures would be implemented. Any spills would be immediately reported to the Ministry of Environment, Conservation and Parks (MECP) Spills Action Centre (1800 268-6060).

Figure 17: Constraints Mapping



Concluding Statement

The proposed development project is located on disturbed lands from the former old wooden mill and its associated lagoons. The latter has been backfilled. Much of the direct footprint will occur within these previously developed lands. The habitat within the site was not found to be significant however the adjacent lands to the north and west were (PSW, potential Blanding's turtle habitat, and fish habitat). A minimum of 30 m setback from the existing boundary of the PSW and the river will be established. With respect to SAR no direct impacts are anticipated and any indirect impacts to aquatic SAR (i.e., turtles) can be mitigated through the installation of exclusion fences, covering of stockpiles during nesting season and education of workers. The portion of wetland to be impacted by the road extension is unevaluated but adjacent to the newly categorized PSW. This area, referred to as the southern wetland, will be impacted. Roughly 0.04ha of the unevaluated wetland would be removed. This area was directly impacted by historical infills, clearing of vegetation and excavations. It offered limited wetland functions. The area delineated as a PSW on the provincial mapping would not be impacted. The indirect impacts to this wetland due to the loss of drainage from the road, is anticipated to be not measurable (<1% of drainage area would be impacted). The impacts to this small area for the road, could be offset within the northern wetland. An offsetting plan would need to consider advice from MVCA, DFO and MECP and would be completed by time of registration.

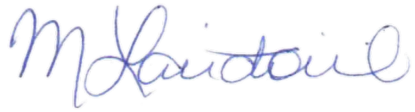
Much of the site could provide nesting habitat for birds protected by the FWCA or MBCA. Clearing of vegetation has the potential to impact various species and several timing windows were included above. The combined period during which **no clearing of vegetation** should take place is between **April 1 to September 30 (birds and bats and would also protect Blanding's Turtle during active season, if needed)**. Should avoidance of this period not be possible, then follow additional mitigation measures listed above.

Note that the fisheries assessment is based on no work occurring below the normal high-water mark. Should this change during detailed design, then additional review by a fisheries biologist will be required.

I trust that this report will meet your requirements. Should you have any questions or comments, please contact the undersigned.

Sincerely,

Bowfin Environmental Consulting/CIMA+



Michelle Lavictoire, Biologist/Principal

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Atlas of the Breeding Birds of Ontario

Squares: 18VR10, 18VQ19, 18VR00, 18VQ09

Common Name	Scientific Name	ABBO Category	SRANK	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status
Canada Goose	*Branta canadensis*	Confirmed	S5	no status	no status
Wood Duck	*Aix sponsa*	Confirmed	S5	no status	no status
Gadwall	*Anas strepera*	Possible	S4	no status	no status
American Black Duck	*Anas rubripes*	Confirmed	S4	no status	no status
Mallard	*Anas platyrhynchos*	Confirmed	S5	no status	no status
Northern Shoveler	*Anas clypeata*	Probable	S4	no status	no status
Green-winged Teal	*Anas crecca*	Probable	S4	no status	no status
Blue-winged Teal	*Anas discors*	Confirmed	S4	no status	no status
Common Goldeneye	*Bucephala clangula*	Possible	S5	no status	no status
Hooded Merganser	*Lophodytes cucullatus*	Confirmed	S5B,S5N	no status	no status
Common Merganser	*Mergus merganser*	Confirmed	S5B,S5N	no status	no status
Ring-necked Pheasant	*Phasianus colchicus*	Possible	SNA	no status	no status
Ruffed Grouse	*Bonasa umbellus*	Confirmed	S4	no status	no status
Wild Turkey	*Meleagris gallopava*	Confirmed	S5	no status	no status
Common Loon	*Gavia immer*	Confirmed	S5B, S5N	no status	no status
Pied-billed Grebe	*Podilymbus podiceps*	Confirmed	S4B, S4N	no status	no status
American Bittern	*Botaurus lentiginosus*	Confirmed	S4B	no status	no status
Great Blue Heron	*Ardea herodias*	Confirmed	S4	no status	no status
Green Heron	*Butorides virescens*	Confirmed	S4B	no status	no status
Turkey Vulture	*Cathartes aura*	Confirmed	S5B	no status	no status
Osprey	*Pandion haliaetus*	Confirmed	S5B	no status	no status
Northern Harrier	*Circus cyaneus*	Confirmed	S4B	no status	no status
Sharp-shinned Hawk	*Accipiter striatus*	Probable	S5	no status	no status
Cooper's Hawk	*Accipiter cooperii*	Probable	S4	no status	no status
Northern Goshawk	*Accipiter gentilis*	Confirmed	S4	no status	no status
Red-shouldered Hawk	*Buteo lineatus*	Probable	S4B	no status	no status
Broad-winged Hawk	*Buteo platypterus*	Possible	S5B	no status	no status
Red-tailed Hawk	*Buteo jamaicensis*	Confirmed	S5	no status	no status
American Kestrel	*Falco sparverius*	Confirmed	S4	no status	no status
Merlin	*Falco columbarius*	Probable	S5B	no status	no status
Virginia Rail	*Rallus limicola*	Confirmed	S5B	no status	no status
Sora	*Porzana carolina*	Confirmed	S4B	no status	no status
Common Gallinule	*Gallinula galeata*	Possible	S4B	no status	no status
American Coot	*Fulica americana*	Possible	S4B	no status	no status

Common Name	Scientific Name	ABBO Category	SRANK	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status
Killdeer	*Charadrius vociferus*	Confirmed	S5B, S5N	no status	no status
Spotted Sandpiper	*Actitis macularia*	Confirmed	S5	no status	no status
Upland Sandpiper	*Bartramia longicauda*	Probable	S4B	no status	no status
Common Snipe	*Gallinago delicata*	Confirmed	S5B	no status	no status
American Woodcock	*Scolopax minor*	Confirmed	S4B	no status	no status
Common Tern	*Sterna hirundo*	Confirmed	S4B	no status	no status
Rock Pigeon	*Columba livia*	Confirmed	SNA	no status	no status
Mourning Dove	*Zenaida macroura*	Confirmed	S5	no status	no status
Black/Yellow-billed Cuckoo	*Coccyzus erythropthalmus/americanus*	Possible	S5B, S4B	no status	no status
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Probable	S5B	no status	no status
Eastern Screech-Owl	*Megascops asio*	Possible	S4	no status	no status
Great Horned Owl	*Bubo virginianus*	Confirmed	S4	no status	no status
Barred Owl	*Strix varia*	Confirmed	S5	no status	no status
Northern Saw-whet Owl	*Aegolius acadicus*	Probable	S4	no status	no status
Common Nighthawk	*Chordeiles minor*	Confirmed	S4B	SC	THR
Whip-poor-will	*Caprimulgus vociferus*	Possible	S4B	THR	THR
Chimney Swift	*Chaetura pelagica*	Probable	S4B, S4N	THR	THR
Ruby-throated Hummingbird	*Archilochus colubris*	Confirmed	S5B	no status	no status
Belted Kingfisher	*Ceryle alcyon*	Confirmed	S4B	no status	no status
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Confirmed	S5B	no status	no status
Downy Woodpecker	*Picoides pubescens*	Confirmed	S5	no status	no status
Hairy Woodpecker	*Picoides villosus*	Confirmed	S5	no status	no status
Northern Flicker	*Colaptes auratus*	Confirmed	S4B	no status	no status
Pileated Woodpecker	*Dryocopus pileatus*	Confirmed	S5	no status	no status
Olive-sided Flycatcher	*Contopus cooperi*	Probable	S4B	SC	THR
Eastern Wood-Pewee	*Contopus virens*	Confirmed	S4B	SC	SC
Yellow-bellied Flycatcher	*Empidonax flaviventris*	Possible	S5B	no status	no status
Alder Flycatcher	*Empidonax alnorum*	Confirmed	S5B	no status	no status
Willow Flycatcher	*Empidonax traillii*	Confirmed	S5B	no status	no status
Least Flycatcher	*Empidonax minimus*	Confirmed	S4B	no status	no status
Eastern Phoebe	*Sayornis phoebe*	Confirmed	S5B	no status	no status
Great Crested Flycatcher	*Myiarchus crinitus*	Confirmed	S4B	no status	no status
Eastern Kingbird	*Tyrannus tyrannus*	Confirmed	S4B	no status	no status
Blue-headed Vireo	*Vireo solitarius*	Possible	S5B	no status	no status
Warbling Vireo	*Vireo gilvus*	Confirmed	S5B	no status	no status
Red-eyed Vireo	*Vireo olivaceus*	Confirmed	S5B	no status	no status
Blue Jay	*Cyanocitta cristata*	Confirmed	S5	no status	no status
American Crow	*Corvus brachyrhynchos*	Confirmed	S5B	no status	no status
Common Raven	*Corvus corax*	Confirmed	S5	no status	no status

Common Name	Scientific Name	ABBO Category	SRANK	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status
Purple Martin	*Progne subis*	Confirmed	S3S4B	no status	no status
Tree Swallow	*Tachycineta bicolor*	Confirmed	S4B	no status	no status
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Confirmed	S4B	no status	no status
Bank Swallow	*Riparia riparia*	Confirmed	S4B	THR	THR
Barn Swallow	*Hirundo rustica*	Confirmed	S4B	THR	THR
Black-capped Chickadee	*Poecile atricapilla*	Confirmed	S5	no status	no status
Red-breasted Nuthatch	*Sitta canadensis*	Probable	S5	no status	no status
White-breasted Nuthatch	*Sitta carolinensis*	Confirmed	S5	no status	no status
Brown Creeper	*Certhia familiaris*	Probable	S5B	no status	no status
Carolina Wren	*Thryothorus ludovicianus*	Possible	S4	no status	no status
House Wren	*Troglodytes aedon*	Confirmed	S5B	no status	no status
Winter Wren	*Troglodytes troglodytes*	Probable	S5B	no status	no status
Sedge Wren	*Cistothorus platensis*	Possible	S4B	no status	no status
Marsh Wren	*Cistothorus palustris*	Confirmed	S4B	no status	no status
Ruby-crowned Kinglet	*Regulus calendula*	Possible	S4B	no status	no status
Eastern Bluebird	*Sialia sialis*	Confirmed	S5B	no status	no status
Veery	*Catharus fuscescens*	Confirmed	S4B	no status	no status
Swainson's Thrush	*Catharus ustulatus*	Probable	S4B	no status	no status
Hermit Thrush	*Catharus guttatus*	Probable	S5B	no status	no status
Wood Thrush	*Hylocichla mustelina*	Confirmed	S4B	SC	THR
American Robin	*Turdus migratorius*	Confirmed	S5B	no status	no status
Gray Catbird	*Dumetella carolinensis*	Confirmed	S4B	no status	no status
Northern Mockingbird	*Mimus polyglottos*	Probable	S4	no status	no status
Brown Thrasher	*Toxostoma rufum*	Confirmed	S4B	no status	no status
European Starling	*Sturnus vulgaris*	Confirmed	SNA	no status	no status
Cedar Waxwing	*Bombycilla cedrorum*	Confirmed	S5B	no status	no status
Golden-winged Warbler	*Vermivora chrysoptera*	Possible	S4B	SC	THR
Nashville Warbler	*Vermivora ruficapilla*	Confirmed	S5B	no status	no status
Yellow Warbler	*Dendroica petechia*	Confirmed	S5B	no status	no status
Chestnut-sided Warbler	*Dendroica pensylvanica*	Confirmed	S5B	no status	no status
Magnolia Warbler	*Dendroica magnolia*	Probable	S5B	no status	no status
Black-throated Blue Warbler	*Dendroica caerulescens*	Possible	S5B	no status	no status
Yellow-rumped Warbler	*Dendroica coronata*	Probable	S5B	no status	no status
Black-throated Green Warbler	*Dendroica virens*	Confirmed	S5B	no status	no status
Pine Warbler	*Dendroica pinus*	Probable	S5B	no status	no status
Black-and-white Warbler	*Mniotilta varia*	Confirmed	S5B	no status	no status
American Redstart	*Setophaga ruticilla*	Confirmed	S5B	no status	no status
Ovenbird	*Seiurus aurocapillus*	Confirmed	S4B	no status	no status
Northern Waterthrush	*Seiurus noveboracensis*	Confirmed	S5B	no status	no status

Common Name	Scientific Name	ABBO Category	SRANK	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status
Mourning Warbler	*Oporornis philadelphia*	Possible	S4B	no status	no status
Common Yellowthroat	*Geothlypis trichas*	Confirmed	S5B	no status	no status
Canada Warbler	*Wilsonia canadensis*	Probable	S4B	SC	THR
Eastern Towhee	*Pipilo erythrophthalmus*	Possible	S4B	no status	no status
Chipping Sparrow	*Spizella passerina*	Confirmed	S5B	no status	no status
Field Sparrow	*Spizella pusilla*	Probable	S4B	no status	no status
Vesper Sparrow	*Pooecetes gramineus*	Confirmed	S4B	no status	no status
Savannah Sparrow	*Passerculus sandwichensis*	Confirmed	S4B	no status	no status
Song Sparrow	*Melospiza melodia*	Confirmed	S5B	no status	no status
Swamp Sparrow	*Melospiza georgiana*	Confirmed	S5B	no status	no status
White-throated Sparrow	*Zonotrichia albicollis*	Confirmed	S5B	no status	no status
Dark-eyed Junco	*Junco hyemalis*	Possible	S5B	no status	no status
Scarlet Tanager	*Piranga olivacea*	Confirmed	S4B	no status	no status
Northern Cardinal	*Cardinalis cardinalis*	Confirmed	S5	no status	no status
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Confirmed	S4B	no status	no status
Indigo Bunting	*Passerina cyanea*	Confirmed	S4B	no status	no status
Bobolink	*Dolichonyx oryzivorus*	Confirmed	S4B	THR	THR
Red-winged Blackbird	*Agelaius phoeniceus*	Confirmed	S4	no status	no status
Eastern Meadowlark	*Sturnella magna*	Confirmed	S4B	THR	THR
Common Grackle	*Quiscalus quiscula*	Confirmed	S5B	no status	no status
Brown-headed Cowbird	*Molothrus ater*	Confirmed	S4B	no status	no status
Baltimore Oriole	*Icterus galbula*	Confirmed	S4B	no status	no status
Purple Finch	*Carpodacus purpureus*	Confirmed	S4B	no status	no status
House Finch	*Carpodacus mexicanus*	Confirmed	SNA	no status	no status
Pine Siskin	*Carduelis pinus*	Probable	S4B	no status	no status
American Goldfinch	*Carduelis tristis*	Confirmed	S5B	no status	no status
Evening Grosbeak	*Coccothraustes vespertinus*	Confirmed	S4B	SC	SC
House Sparrow	*Passer domesticus*	Confirmed	SNA	no status	no status

Status Updated March 25, 2021

SRANK DEFINITIONS

S4 Apparently Secure, Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 Secure, Common, widespread, and abundant in the nation or state/province.

SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S# Range Rank, A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

S#B Breeding

S#N Non-Breeding

SARO STATUS DEFINITIONS

THR Threatened: A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SC Special Concern: A species with characteristics that make it sensitive to human activities or natural events.

SARA STATUS DEFINITIONS

THR Threatened, a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

SC Special Concern, a wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Appendix B: SAR Hand-Out

The following table provides photographs and general descriptions of potential species at risk that may occur within the project area and information on what actions to take should any of these species be observed.

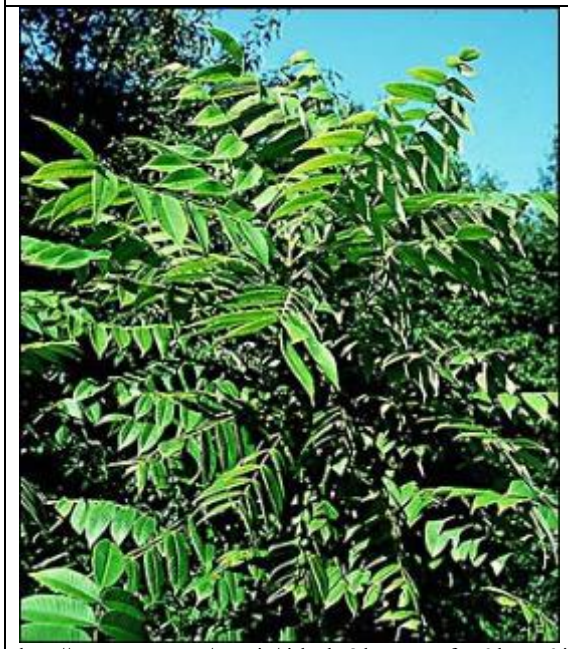
Endangered and Threatened species are protected and cannot be harmed, harassed or killed and in some cases their habitats are also protected. These individuals will only be handled by qualified person and only if the individual is in imminent threat of harm. An authorization under the ESA 2007 would be required to handle individuals that are not in imminent threat of harm.

For all Endangered or Threatened species found on-site any activity which may cause harm to the individual will be stopped and the site supervisor will be contact immediately for further instructions.

Photograph	Description and Status	Biology
 http://www.rom.on.ca/ontario/risk.php?doc_type=fact&lang=&id=311	**American Eel** • Dark coloured elongated fish, • Larger individuals can be anywhere from 20 cm to around 100 cm long **ENDANGERED**	• Stop any activity that may cause harm to these species and contact supervisor. • Individuals should only be encouraged to move if it is in immediate harm's way. These animals can only be handled by a qualified biologist when it is in imminent threat of harm, otherwise an ESA 2007 authorization will be required.
 Photo: Royal Ontario Museum website http://www.rom.on.ca/ontario/risk.php	**Blanding's Turtle** • Medium sized turtle (12.5-28 cm) • Bright yellow on chin and throat. • Shell is dark and can have light coloured spots or lines. The spots fad with age. • The shell is domed. **THREATENED**	• Lives in waterbodies – most often in areas with aquatic vegetation. But because this turtle moves very large distances though all kinds of habitats it can be encountered almost anywhere. • Hibernates in water that is deep enough that it doesn't freeze to the bottom. • It travels to get to or from the hibernation area, to find a mate or to lay its eggs. The hatchlings migrate towards water. • They leave the hibernation sites in early spring (late April to mid-May). • Can nest in gravel along road shoulders. Nests during late May to early June. Usually overnight or in early morning. • Hatchlings leave the nest in the fall *Types of Encounters:* • Blanding's might travel through the area.

Photograph	Description and Status	Biology
 Bernie Muncaster		• They could nest in the fill but none were found to have done so in 2021. *When are you most likely to encounter this species?* • During active season around April 16 to October 15 (in this area). *Avoidance/Mitigation Measures* • If encountered stop all activities and allow individual to leave. Contact your supervisor who will contact Owner. Do not handle unless in immediate danger. • Daily sweeps until end of October and travel <15 km/h. • Install sediment and erosion control measures when working within 30 m of the river.
Photograph	**Description and Status**	**Biology**

Photograph	Description and Status	Biology
  Michelle Lavictoire  Photo: Royal Ontario Museum Website http://www.rom.on.ca/ontario/risk.php	**Eastern Musk Turtle** • Small turtle (adults 5.1-11.5 cm) • Smooth, olive to black skin with two light coloured stripes on each side of the head • The shell is yellow-brown and has a high dome **Northern Map Turtle** • Medium sized turtle (adults 9-27 cm) • Head, legs and tail have yellow lines, a yellow patch is located behind the eyes. • Shell is brown to green with many small lines that become duller with age. **Snapping Turtle** • Large turtle (20.3-26 cm) • Brown turtle • Triangle shaped scales down the tail **SPECIAL CONCERN**	• Spends most of its life in waterbodies • Hibernates in water that is deep enough that it doesn't freeze to the bottom. • Can nest in gravel along road shoulders. Nests during early to mid-summer. Usually overnight or in early morning. • Hatchlings leave the nest in the fall *Types of Encounters:* • Turtles might travel through the area or nest in disturbed areas. *When are you most likely to encounter this species?* • Turtle active season is April 1 to September 30 (in Renfrew Area). These are approximate dates and are dependent on weather. *Avoidance/Mitigation Measures* • Daily sweeps until end of October and restrict vehicle travel to <15 km/hr • Install appropriate sediment and erosion control measures when working within 30 m of the river.

Photograph	Description	Action to be Taken
 http://www.rom.on.ca/ontario/risk.php?doc_type=fact&lang=&id=298	**Butternut** • Medium sized tree with multiple leaflets. • Similar to walnuts, but walnuts usually have a small or missing leaflet at the tip. **ENDANGERED** **Butternut** • Medium sized tree with multiple leaflets. • Similar to walnuts, but walnuts usually have a small or missing leaflet at the tip. **ENDANGERED**	• Butternuts located on site have been identified and are to be protected. These are all over 25 m away. Any new tree, not previously assessed, needs to be protected with a 50 m buffer until it has been classified as a Category 1, 2 or 3 butternut and the appropriate measures undertaken. • Butternuts located on site have been identified and are to be protected. These are all over 25 m away. • Any new tree, not previously assessed, needs to be protected with a 50 m buffer until it has been classified as a Category 1, 2 or 3 butternut and the appropriate measures undertaken.

Appendix C: DFO Aquatic Species at Risk Mapping (February 18, 2022)