

Appendix B

Natural Environment Memo

To: Mr. Chris Traini, P. Eng., County of Middlesex
From: Kasey McKenzie, Dillon Consulting Limited
Ashley Smith, Dillon Consulting Limited
Date: March 18, 2022
Subject: Natural Environment Summary Memo – Blacks Bridge Environmental Assessment
Our File: 20-3135

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by the County of Middlesex (the “County”) to complete a Schedule C Municipal Class Environmental Assessment (EA) for Blacks Bridge (Structure ID 19-45) in the Municipality of North Middlesex, Ontario. The preferred alternative is replacement with a new bridge.

The purpose of this Natural Environment Summary Memo is to verify the findings of the preliminary natural heritage background review and screening summarized in the *Species at Risk Technical Memo* (Dillon 2020); summarize existing conditions identified via a site reconnaissance level survey; identify potential significant natural features and constraints; outline preliminary recommended mitigation measures to potential impacts; and identify agency consultation requirements and anticipated permits and approvals for the work. The Study Area is located along West Corner Drive in the community of Ailsa Craig and includes 120 m of investigation surrounding the bridge crossing the Ausable River (**Figure 1**).

2.0 Desktop Review

To identify potential Species at Risk (SAR) and SAR habitat, as well as Significant Wildlife Habitat (SWH), the *Species at Risk Technical Memo* (Dillon 2020) was reviewed, as well as an updated background search conducted of various publicly available record sources for historical SAR occurrence records. The record sources searched included the following:

- Middlesex County Official Plan (Middlesex County, 2006)
- Municipality of North Middlesex Official Plan (2018)
- Middlesex Natural Heritage Study (Middle sec County 2014)
- Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC) (Land Information Ontario, 2021)
- Mammals of the Western Hemisphere (Patterson et al. 2007)

- Atlas of the Mammals of Ontario (Dobbyn, 1994)
- Fisheries and Oceans Canada Aquatic Species at Risk map (DFO; 2021)
- SAR Regulated Habitat under Ontario Regulation (O. Reg.) 242/08
- Ontario Breeding Bird Atlas (OBBA; Birds Canada, 2006)
- Ontario Christmas Bird Count (Birds Canada, 2021)
- Ontario Butterfly Atlas (Toronto Entomologists Association, 2019)
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019).

The woodlands within the Study Area are designated as Significant Woodlands within both the Middlesex County Official Plan (OP), through the Middlesex Natural Heritage Study and the Municipality of North Middlesex OP due to their proximity to a watercourse.

The Municipality of North Middlesex OP also identified Hazard Lands within the Study Area. See **Appendix A** for the applicable OP schedules.

Significant Wildlife Habitat and Species of Conservation Concern

The Significant Wildlife Habitat Technical Guide (MNRF, 2000) defines Species of Conservation Concern (SCC) as species listed as *Threatened* or *Endangered* under the federal Species at Risk Act (SARA), but not *Threatened* or *Endangered* under the Endangered Species Act (ESA, 2007), and/or species that are provincially rare/tracked (i.e., have a Provincial Rank of S1-Critically imperiled, S2 – Imperiled, or S3 – Vulnerable) or are designated as *Special Concern* under the ESA, 2007. The SCC listed in **Table 1** have been identified with the potential to occur within or adjacent to the Study Area.

Table 1: SCC with the Potential to Occur within the Study Area

Scientific Name	Common Name	SARA ¹	ESA ²	SRank ³	Info Source ⁴
Mussels					
Villosa iris	Rainbow	SC	SC	S1	DFO, NHIC
Fish					
Lepomis peltastes	Northern Sunfish	SC	SC	S3	DFO
Esox americanus vermiculatus	Grass Pickerel	SC	SC	S3	DFO, NHIC
Moxostoma carinatum	River Redhorse	SC	SC	S2	DFO
Birds					
Contopus virens	Eastern Wood-pewee		SC	S4B	OBBA
Herptiles					
Graptemys geographica	Northern Map Turtle	SC	SC	S3	ORAA
Chelydra serpentina	Snapping Turtle	SC	SC	S3	ORAA
Lampropeltis triangulum	Eastern Milksnake	SC		S3	ORAA
Lepidoptera					
Danaus plexippus	Monarch	SC	SC	S2N, S4B	TEA

¹ Status identified by the Committee on the Status of Endangered Wildlife in Canada under the federal SARA, 2002;

² SAR in Ontario List under the provincial ESA, 2007;

³ Ontario S-Rank; S5 = secure; S4= apparently secure; S3 = vulnerable; S2 = imperilled; S1= extremely rare; SB = breeding migrants/vagrants; SN = Non-breeding migrants/vagrants;

⁴ OBBA = Ontario Breeding Bird Atlas, DFO = Department of Fisheries and Oceans: Species at Risk Map, ORAA = Ontario Nature: Ontario Reptile and Amphibian Atlas, NHIC = Natural Heritage Information Centre, TEA = Toronto Entomologists' Association

Based on a review of background data and satellite imagery, the following SWH, as defined by the Eco-region 7E Criterion Schedules (MNRF, 2015), have the potential to occur within the Study Area:

- Bat Maternity Colonies
- Turtle Wintering Areas
- Colonially – Nesting Bird Breeding Habitat (Tree/Shrubs)
- Waterfowl Nesting Area
- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat
- Amphibian Breeding Habitat (Wetland)
- Marsh Breeding Bird Habitat
- Special Concern and Rare Wildlife Species.

Detailed field surveys to confirm wildlife presence and habitat use were not undertaken for the study; however, the site reconnaissance included visual observations of habitat features in the study area.

Species at Risk

Based on the findings of the *Species at Risk Technical Memo* (Dillon 2020) and an updated background review, a number of SAR listed as *endangered* and *threatened* under the ESA, 2007 have been identified with potential to occur within the vicinity of the Study Area (**Table 2**).

Table 2: SAR with the Potential to Occur within the Study Area

Scientific Name	Common Name	SARA ⁵	ESA ⁶	SRank ⁷	Info Source ⁸
Mussels					
<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell	END	END	S1	DFO, NHIC
<i>Epioblasma triquetra</i>	Snuffbox	END	END	S1	DFO, NHIC
<i>Lampsilis fasciola</i>	Wavy-rayed Lampmussel	SC	THR	S1	DFO, NHIC
<i>Ptychobranhus fasciolaris</i>	Kidneyshell	END	END	S1	DFO, NHIC
Fish					
<i>Ammocrypta pellucida</i>	Eastern Sand Darter (Ontario populations)	THR	END	S2	DFO, NHIC
<i>Moxostoma duquesnei</i>	Black Redhorse	THR	THR	S2	DFO
<i>Acipenser fulvescens</i>	Lake Sturgeon	Not Listed	THR	S3	NHIC
Birds					
<i>Hirundo rustica</i>	Barn Swallow	THR	THR	S4B	OBBA

⁵ Federal Species at Risk Act (THR= threatened)

⁶ Ontario Endangered Species Act (THR= threatened, SC= Special Concern)

⁷ Ontario SRank; S5 = secure; S4= apparently secure; S3 = vulnerable; S2 = imperiled; S1 = extremely rare; SX = Extirpated; SH = Possibly Extirpated; SNA = non-native or exotic species to Ontario; SB = breeding migrants/vagrants

⁸ OBBA = Ontario Breeding Bird Atlas, DFO = Department of Fisheries and Oceans: Species at Risk Map, ORAA = Ontario Nature: Ontario Reptile and Amphibian Atlas, NHIC = Natural Heritage Information Centre, TEA = Toronto Entomologists' Association, MWH = Digital Distribution Maps of the Mammals of the Western Hemisphere

Scientific Name	Common Name	SARA ⁵	ESA ⁶	SRank ⁷	Info Source ⁸
<i>Riparia</i>	Bank Swallow	THR	THR	S4B	OBBA
Mammals					
<i>Myotis lucifugus</i>	Little Brown Myotis	END	END	S4	MWH
<i>Myotis septentrionalis</i>	Northern Myotis	END	END	S3	MWH
<i>Perimyotis subflavus</i>	Tricolored Bat	END	END	S3	MWH
Plants					
<i>Juglans cinerea</i>	Butternut	END	END	S3?	NHIC

3.0 Site Investigation Methodology

To assess aquatic and terrestrial habitat in the Ausable River and surrounding riparian area of the existing bridge, Dillon undertook a site reconnaissance level field visit on September 28, 2021, which consisted of Ecological Land Classification (ELC), a single-season vegetation inventory and an aquatic habitat assessment.

The following subsections outline Dillon's field survey methodologies.

Aquatic Habitat Assessment

Due to the presence of aquatic SAR critical habitat within the work site, an aquatic habitat assessment was conducted on the Ausable River with a focus area of 100 m upstream and 100 m downstream of Blacks Bridge. Information collected during the assessment included (where applicable):

- Channel form
- Presence/absence of flow
- Substrate type
- Riparian vegetation
- In-stream cover

- Aquatic vegetation.

This data was used, in part, to determine the overall condition and sensitivity of the stream, as well as habitat suitability for the aquatic SAR and SCC indicated in **Table 1** and **Table 2**. Results of the stream assessment are included in **Section 4.0**.

Vegetation Communities

Vegetation communities were assessed using ELC to identify and classify potential natural heritage features within the Study Area. During the field investigations, vegetation was characterized using the ELC System for Southern Ontario (Lee et al., 1998, 2008) in order to classify and map ecological communities to the vegetation level, where possible.

Results of ELC surveys are included in **Section 4.0**.

Incidental Wildlife and Wildlife Habitat

Incidental observations of wildlife and/or potential wildlife habitat were noted during the September 28, 2021 survey, including wildlife evidence such as dens, nests, tracks, and scat. Incidental wildlife observations are summarized in **Section 4.0**.

4.0 Site Investigation Results

Aquatic Habitat Assessment

The Ausable River at Blacks Bridge is a permanent river that flows south-west, emptying into Lake Huron. The majority of the Ausable River supports a warm water thermal regime, including the section that flows under Blacks Bridge, and supports a warm water fish community. This assessment was conducted by evaluating the habitat 100 m upstream and 100 m downstream of the bridge to provide recommendations based on the riparian and aquatic habitat features on either side of the bridge for construction equipment staging and potential in-water works.

The main habitat type included a consistently flowing run without obvious riffle or pool sequences. Turbidity was high, and as a result determination of substrate type and macrophyte abundance throughout the channel was limited. However, dominant substrate within 1 m of both the east and west banks that was accessible to sample was dominantly sand substrate, with some cobble (see **Attachment B – Site Photos**). Due to the size of the river, wetted width was not measured during field evaluations. Rather, measurements were taken via aerial delineation with satellite imagery, which indicates that the widest point of the river within the

200 m survey area was 35 m, and the narrowest section was approximately 18 m (Google Earth Pro, 2018). Banks were generally protected from erosion; however, the west bank was defined as a deposition zone, and the east bank, due to its steep elevation and lack of deep rooted vegetation, may be susceptible to erosion. The east bank downstream from the bridge had mild erosion measuring approximately 1.5 m high (**See Attachment B**).

In-stream cover habitat was limited, but consisted mainly of cobble with some riparian woody debris. Willow species were abundant within the riparian areas on the west bank, and due to high water levels they were mostly submerged, providing additional seasonal cover. Cover was also provided by overhanging woody debris and by the bridge. Shade cover was provided by abundant willow species on the west bank and forest on the east bank. Limited aquatic vegetation was identified due to turbidity; however, some milfoil species were found deposited on shrubs and trees on banks due to high flows.

Between 10-30% of the river was shaded by riparian vegetation. Habitat upstream from the bridge (north) on the west bank included wet meadow up to 100 m. The east bank upstream from the bridge consisted of forest up to 100 m. Habitat downstream of the bridge (south) included meadow within 10 m of the west bank, with a marsh at 10-30 m and agricultural fields at 60 m-100 m. The east bank was forest at 0-30 m, with a road (Queen Street) at 60 m, and cultivated forest at 100 m.

The aquatic habitat assessment of the Ausable River at the Blacks Bridge crossing identified potentially suitable habitat for all SAR mussels identified in the study area by DFO. Although the site itself did not have any obvious riffle sequences, this may have been due to high water flows and volume following a rain event within the 24 hours prior to the assessment. The substrate was predominantly sand with some cobble, which is indicative of the preferred habitat for the mussels in **Table 1** and **Table 2**. In addition to freshwater mussel habitat suitability, the Ausable River was also suitable for Black Redhorse and Eastern Sand Darter, which both prefer sandy substrate in warm rivers with moderately strong currents.

Vegetation Communities

A total of eight ecological communities were observed within the Study Area during the field survey (**Table 3**). The location, type, and boundaries of these vegetation communities are delineated in **Figure 3**. Reference photos for each of the vegetation communities observed can be found in **Appendix C**.

Table 3: Vegetation Communities within the Study Area

ELC Code	Classification	Community Description
OAG	Open Agriculture	Cropland cleared at the time of the survey.
TAGM1	Coniferous Plantation	<p>This community was dominated by White Pine (<i>Pinus strobus</i>) with White Spruce (<i>Picea glauca</i>) and White Cedar (<i>Thuja occidentalis</i>) also abundant.</p> <p>A hydro corridor runs NE and SW through this community with a narrow strip of manicured grass along the corridor.</p>
MAMM3-1/MEMM4 Complex	Mixed Mineral Meadow Marsh Type and Fresh-Moist Mixed Meadow Complex	<p>This community was dominated by Giant Ragweed (<i>Ambrosia trifida</i>) and Reed Canary Grass (<i>Phalaris arundinacea</i>) with sparse willow species (<i>Salix sp.</i>). This community is a floodplain, which floods in the spring and becomes drier in the summer months. The complexing of fresh-moist meadow and meadow marsh represents the variable flooding and mixture of upland plant species with some facultative wetland species. The community had been recently flooded at the time of the survey.</p>
SWTM3-6	Mixed Willow Mineral Deciduous Thicket Swamp	This community occurs linearly along the NW bank of the Ausable River and was dominated by a mixture of willow species (<i>Salix sp.</i>).
MEMM3	Dry - Fresh Mixed Meadow Ecosite	<p>This community was dominated by Wild Carrot (<i>Daucus carota</i>), Orchard Grass (<i>Dactylis glomerata</i>), New England Aster (<i>Symphyotrichum novae-angliae</i>) and Tall Goldenrod (<i>Solidago altissima</i>). This community occurred along the disturbed roadside, as well as on the steep slope along the Ausable River in the northeastern portion of the Study Area.</p>

FODM7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest Type	<p>This community was dominated by Black Walnut (<i>Juglans nigra</i>) with other abundant tree species including Common Hackberry (<i>Celtis occidentalis</i>), Crack Willow (<i>Salix x fragilis</i>) and Black Maple (<i>Acer nigrum</i>).</p> <p>A Mixed Mineral Meadow Marsh (MAMM3) inclusion was present in an opening in the forest on the slope, as well as at the bottom of the slope close to the river south of West Corner Drive.</p> <p>This community is steeply sloped and had been recently flooded at the time of the survey.</p>
FODM7	Fresh – Moist Lowland Deciduous Forest Ecosite	<p>This community was dominated by Basswood (<i>Tilia americana</i>) and Black Walnut with the occasional White Elm (<i>Ulmus americana</i>) and Trembling Aspen (<i>Populus tremuloides</i>).</p> <p>A Graminoid Mineral Meadow Marsh (MAMM1) inclusion was present. This is likely due the low topographical elevation in this area, run off from the adjacent field and road, and the presence of a potential upstream seep that discharges water.</p>
SWDM4-1	Willow Mineral Deciduous Swamp Type	<p>This community was dominated by a canopy of Crack Willow with Giant Ragweed in the understory. Areas of pooling water were present at the time of the survey.</p>

It should be noted that the MAMM3-1 / MEMM4, SWDM4-1 and SWTM3-6 communities were difficult to access due to the thick cover of Giant Ragweed, downed trees and flooded areas. Flora was also difficult to identify as most vegetation was covered in dried mud, likely after a flooding event shortly before the survey. As a result, a preliminary assessment of these communities was undertaken and the vegetation type was determined to the extent possible. Should there be extensive area disturbance impacts in these vegetation communities, additional vegetation surveys may be required at the detailed design phase.

Incidental Species Observations

Wildlife species incidentally observed during the field surveys are summarized in **Table 4**. All species observed are considered apparently secure (S4) or secure (S5) in Ontario. Two inactive Cliff Swallow (*Petrochelidon pyrrhonota*) nests were observed on the underside of Blacks Bridge. A mammal burrow of an unidentified species was also observed within the FODM7 community NE of the bridge.

Table 4: Incidental Wildlife Observations

Scientific Name	Common Name	SARA ⁹	ESA ¹⁰	SRank ¹¹	Observation Details
<i>Ardea herodias</i>	Great Blue Heron			S4	Two observed; flyover
<i>Carduelis tristis</i>	American Goldfinch			S5B	One; vocalization
<i>Poecile atricapillus</i>	Black-capped Chickadee			S5	One; vocalization
<i>Cyanocitta cristata</i>	Blue Jay			S5	One; vocalization
<i>Cathartes aura</i>	Turkey Vulture			S5B	One observed; flyover
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel			S5	One observed

Significant Wildlife Habitat and Species at Risk

No SAR were observed during the site reconnaissance survey; however, suitable habitat was identified for select SAR identified as having the potential to occur within the Study Area. These potential SAR are discussed below.

Barn Swallow (Threatened) was identified within the Ontario Breeding Bird Atlas (Bird Canada, 2006) to have the potential to occur within the Study Area. Barn Swallows forage in open

⁹ Federal Species at Risk Act (THR= threatened)

¹⁰ Ontario Endangered Species Act (THR= threatened, SC= Special Concern)

¹¹ Ontario SRank; S5 = secure; S4= apparently secure; S3 = vulnerable; S2 = imperiled; SX = Extirpated; SH = Possibly Extirpated; SNA = non-native or exotic species to Ontario; SB = breeding migrants/vagrants

spaces with abundant insects such as over farmland or rural areas near bodies of water. They use a variety of structures for nesting such as cliffs, caves and rock niches, as well as man-made structures including barns, buildings, bridges and large culverts (MNRF, 2021a). Open fields are found adjacent to the Ausable River. No sign of Barn Swallow nesting was observed on Blacks Bridge during the survey. As such, there is currently no Barn Swallow habitat identified in the Study Area; however, there is a potential for this species to nest under the bridge and an inactive Cliff Swallow nest was observed in this location. Accordingly, it is recommended that if disturbance to the bridge structure is to take place, nest prevention measures should be considered to avoid a contravention to the *Migratory Bird Convention Act, 1994* (MBCA).

Butternut (Endangered) was also identified to have the potential to occur within the Study Area based on the location of the Study Area within southern Ontario and the habitat present. Butternut are often found within open deciduous forests or along forest edges, within moist, well-drained soil along streams (MNRF, 2021b). The Study Area contains an open woodland with forest edges along a stream bank; however, no Butternut trees were observed during the survey.

SAR Bats have the potential to occur within the wooded areas of the Study Area. During the summer, bat species roost in a variety of forested habitats and anthropogenic structures, typically mature forests, and forage within open areas and along watercourses adjacent to woodlands (Environment Canada, 2015). The forests within the Study Area contain trees that are small in size with no obvious cavity/snag trees observed during the survey. As such, the Study Area is not suitable roosting habitat for bats, including SAR bats.

The critical habitat and/or regulated habitat of four mussel species has been identified by Fisheries and Oceans Canada (DFO; 2019) and the Ministry of Natural Resources and Forestry (MNRF; 2020) within the Ausable River within close proximity of the Study Area. The Northern Riffleshell (*Epioblasma torulosa rangiana*), Snuffbox (*Epioblasma triquetra*), Wavy-rayed Lampmussel (*Lampsilis fasciola*), and Kidneyshell (*Ptychobranhus fasciolaris*) all require similar habitat of rocky, gravely or sandy river bottoms with shallow, swift moving water, often within riffle areas. All of these mussels are found within the Ausable River.

Critical habitat for Black Redhorse (*Moxostoma duquesnei*) has also been identified by the DFO (2019) and has the potential to exist within the Study Area. Additional SAR include the Eastern Sand Darter (*Ammocrypta pellucida*), which has the potential to occur within the Study Area. Both of these SAR require sandy or fine gravel bottom streams and are known to exist within the Ausable River. Based on the habitat preferences of each respective species, including sandy

substrate and large, slow moving, warm rivers, it is possible that these species may occur within the study site.

Based on background review, the following aquatic SCC have the potential to occur in the Ausable River within the Study Area:

- Rainbow (Special Concern)
- River Redhorse (Special Concern)
- Northern Sunfish (Special Concern)
- Grass Pickerel (Special Concern).

Based on the habitat observed during the site reconnaissance survey, the following were identified as candidate SWH:

- Turtle Wintering Areas – the open water of the Ausable River
- Special Concern and Rare Wildlife Species.
 - Eastern Wood-pewee (Special Concern) – suitable habitat within the FOD7-4 and FOD7 communities
 - Northern Map Turtle (Special Concern) – suitable habitat within the Ausable River
 - Snapping Turtle (Special Concern) – suitable habitat within the Ausable River
 - Eastern Milksnake (S3) – suitable habitat within the farmland and meadows.

5.0 Constraints and Opportunities

Constraints

Although no SAR occurrences were observed during the site reconnaissance survey, potential habitat for the following SAR identified during the background review was observed:

- Black Redhorse (Critical Habitat, SARA)
- Eastern Sand Darter
- Kidneyshell (Critical Habitat, SARA)
- Snuffbox (Critical Habitat, SARA)
- Northern Riffleshell (Critical Habitat, SARA)
- Wavy-rayed Lampmussel.

Based on the potential habitat observed during the site reconnaissance survey, the following were identified as candidate SWH:

- Turtle Wintering Areas – the Ausable River
- Special Concern and Rare Wildlife Species.
 - Eastern Wood-pewee (Special Concern)
 - Northern Map Turtle (Special Concern)
 - Snapping Turtle (Special Concern)
 - Eastern Milksnake (S3).

Based on background review, the following aquatic SCC have the potential to occur within the Study Area:

- Rainbow (Special Concern) – suitable habitat within the Ausable River
- River Redhorse (Special Concern) – suitable habitat within the Ausable River
- Northern Sunfish (Special Concern) – suitable habitat within the Ausable River
- Grass Pickerel (Special Concern) – suitable habitat within the Ausable River.

The following natural heritage features are also present within the Study Area:

- Significant Woodlands (identified by Middlesex County OP and North Middlesex OP; **Appendix A**)
- Wetlands (SWT3-6 and SWDM4-1 communities)
- Fish and Fish Habitat.

The restricted timelines when in-water works are prohibited within the Study Area is March 15 – July 15 for spring spawning in southwestern Ontario (DFO). As a result, any in-water work would need to occur between July 16 and March 14 of the following year. Note that this timing window will be confirmed with permitting agencies in the event that in-water works are required.

Bridge works and any vegetation removal required for construction should occur outside of the breeding bird period (April 1 – August 31) and bat roosting timing window (May 1 – September 30) to avoid contravention of the Endangered Species Act or the Migratory Birds Convention Act.

Exclusion fencing (i.e., silt fencing) could be installed along the construction area boundary and to contain areas with exposed soil, including stockpile areas, during the turtle active season (May 1 to September 30) to exclude amphibians and reptiles from the work area.

See **Figure 5** for Constraints and Opportunities.

Opportunities

- Incorporate wildlife passage under the bridge on both sides of the Ausable River to allow movement of terrestrial species underneath the bridge instead of over the road
- Installation of wildlife fencing along the north and south sides of the West Corner Drive road allowance adjacent to natural features to reduce the risk of wildlife-vehicle interactions
- Management of invasive species
 - Removal of invasive species currently present within the Study Area including, but not limited to: Autumn Olive (*Elaeagnus umbellata*), European Buckthorn (*Rhamnus cathartica*) and Tartarian Honeysuckle (*Lonicera tatarica*).
- Restore and enhance habitats within the Study Area once bridge works are complete.

See **Figure 5** for Constraints and Opportunities.

6.0 Preliminary Mitigation Measures

Preliminary mitigation measures to avoid or minimize adverse effects to the natural environment are identified below. Additional mitigation measures may be identified through the agency approvals and permitting process.

- Install, maintain and repair erosion and sediment control measures to prevent entry of sediment to the Ausable River.
- Minimize vegetation clearing to the extent possible.
- Machinery is to arrive and depart clean to prevent spread of invasive species to and from other sites.
- Bridge works and any vegetation removal should occur outside the breeding bird season (April 1 to August 31). Should any clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed within 48 hours in advance of clearing activities.
- Clearing any trees should occur outside of the bat roosting timing window (May 1 – September 30). Should any tree removal be required during the roosting window, a search of each tree to be removed must be completed by a qualified person prior to removal.
- If bridge works occur during the turtle active season (May 1 to September 30), exclusion fencing (i.e., silt fencing) should be installed along the construction area boundary and to contain areas with exposed soil, including stockpile areas.
- Avoid or minimize work below the high water mark and in the active channel of the Ausable River.

- In-water work is to occur only within the timing window to protect fish and fish habitat between July 16 and March 14 of the following year. In-water work is prohibited from March 15 – July 15 of any given year.
- In-water work shall be conducted ‘in the dry.’
- Fish and mussels shall be salvaged and relocated from isolated work areas prior to start of in-water work. Depending on water depth, mussel salvage may potentially require licensed divers.
- Store equipment and materials on the existing road allowance to avoid impacts to natural heritage features. If additional staging areas are required, the southwest quadrant may be considered; however, existing hydro wires may pose a constraint.
- If wildlife is encountered, work shall be temporarily suspended until the animal is out of harm’s way.
- Immediately restore and re-vegetate disturbed areas.

If wildlife are persistently found in the construction zone, and allowing them to exit the work area is found to delay construction activity, a Scientific Wildlife Collectors Permit under the Fish and Wildlife Conservation Act, 1997 could be sought in advance by a qualified professional to complete wildlife salvages and transport wildlife to an alternative habitat location. In addition to the Scientific Wildlife Collectors, the qualified professional may need to register under Section 23.17 (Species protection, recovery activities) of Ontario Regulation 242/08 to be able to handle or relocate SAR.

7.0 Recommended Next Steps

The Study Area is within the Ausable Bayfield Conservation Authority (ABCA) Regulated Area. Works within lands regulated by ABCA (e.g., wetlands, watercourses, steep slopes and other natural hazardous areas) are anticipated to require a permit under Ontario Regulation 97/04: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Once the extent of the proposed bridge improvement/rehabilitation or replacement works are known, ABCA should be contacted to confirm the information required to support a permit application.

Barn Swallows have the potential to nest on the underside of the bridge although there was no evidence of the species nesting in 2021. Targeted Barn Swallow surveys within the active season (May to August) are recommended before work on the bridge takes place. If Barn Swallow nesting is observed on the bridge, the project is eligible for exemption registration

under s23.18 (Threats to health and safety, non-imminent) of O. Reg. 242/08 through the submission of a Notice of Activity (NoA) form.

The Study Area contains fish habitat regulated under the federal Fisheries Act as well as Critical Habitat for Species at Risk regulated under SARA. When design details are known, submission of a Request for Review to DFO is recommended to determine which approvals/permits are applicable to the undertaking.

It is recommended that consultation with ABCA and DFO commence as early as possible since timelines for permitting and approvals can potentially affect the project delivery schedule.

8.0 References

Bird Studies Canada, Environment Canada's Canadian Wildlife Service, Ontario Nature, Ontario Field Ornithologists and Ontario Ministry of Natural Resources. 2006. Ontario Breeding Bird Atlas Database, 31 January 2008. <http://www.birdsontario.org/atlas/aboutdata.jsp?lang=en>

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Figures

Figure 1: Study Area



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



MIDDLESEX COUNTY
BLACKS BRIDGE NATURAL
ENVIRONMENT SUMMARY

STUDY AREA
FIGURE 1

- Study Area
- Blacks Bridge
- Waterbody
- Watercourse

0 5 10 20 Meters

SCALE 1:1,250



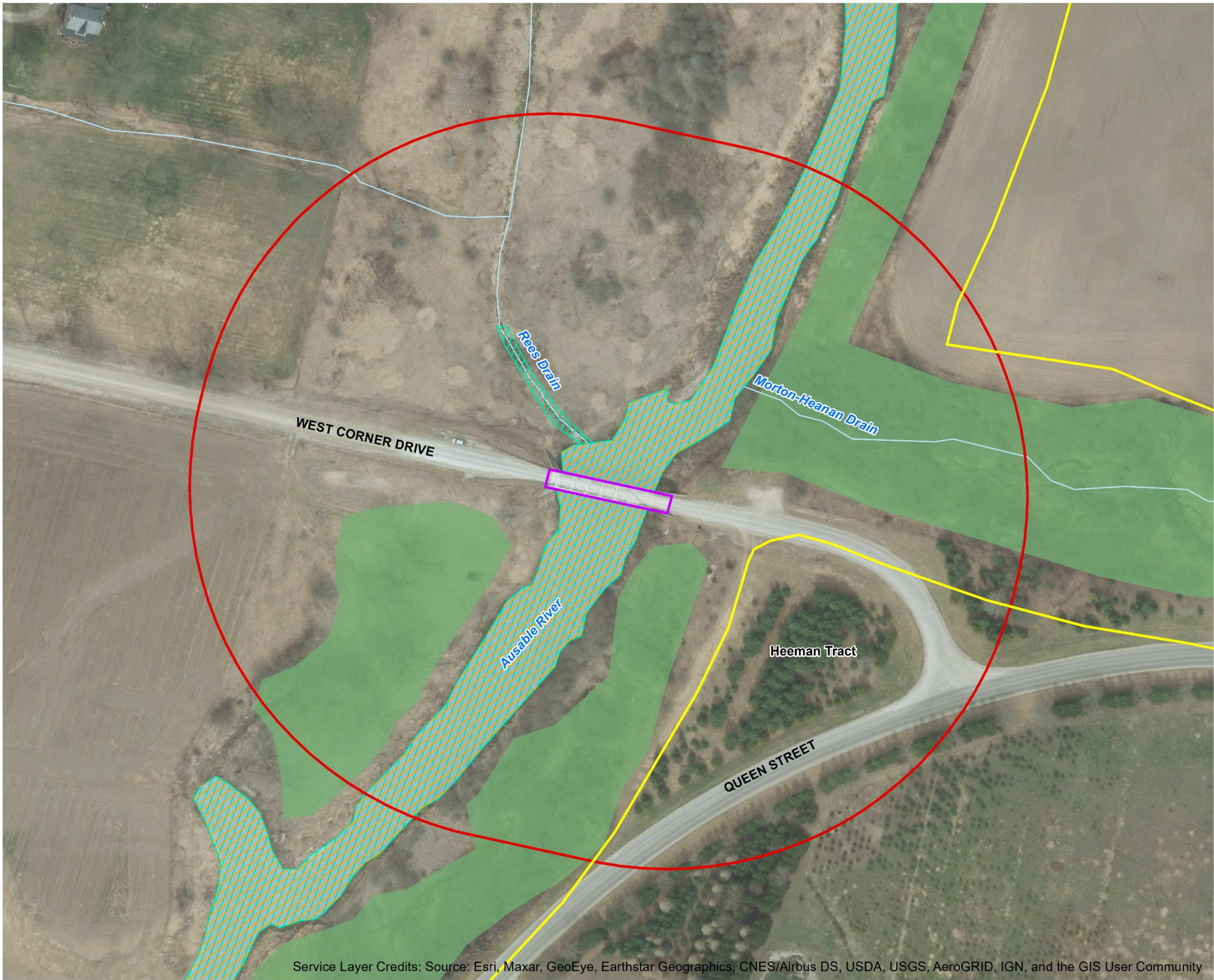
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: ZJB
MAP CHECKED BY: KM
MAP PROJECTION: NAD 1983 UTM Zone 17N



PROJECT: 20-3135
STATUS: DRAFT
DATE: 2021-11-04

Figure 2: Designated Natural Heritage Features



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



MIDDLESEX COUNTY
BLACKS BRIDGE NATURAL
ENVIRONMENT SUMMARY

**DESIGNATED NATURAL
HERITAGE FEATURES**
FIGURE 2

- Study Area
- Blacks Bridge
- DFO Species at Risk Critical Habitat
- DFO Aquatic SAR and SCC
- Ausable Bayfield Conservation Authority Regulated Area
- Significant Woodlands (Middlesex County OP)
- Waterbody
- Watercourse

0 5 10 20 Meters

SCALE 1:1,250



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: ZJB
MAP CHECKED BY: KM
MAP PROJECTION: NAD 1983 UTM Zone 17N

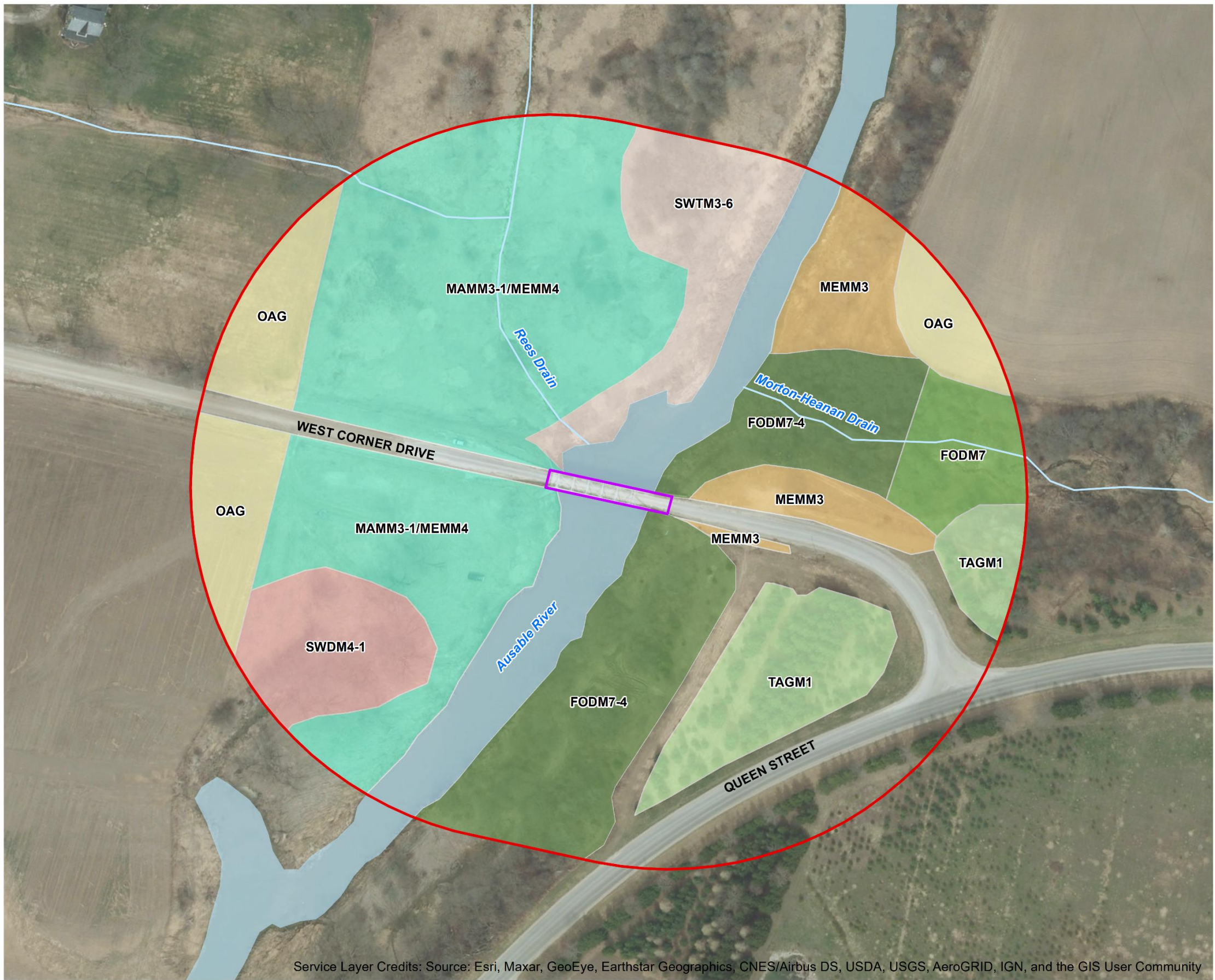


PROJECT: 20-3135

STATUS: DRAFT

DATE: 2021-11-04

Figure 3: Vegetation Communities



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



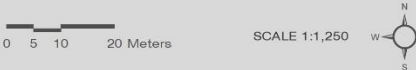
MIDDLESEX COUNTY
BLACKS BRIDGE NATURAL
ENVIRONMENT SUMMARY

VEGETATION COMMUNITIES
FIGURE 3

- Study Area
- Blacks Bridge
- Waterbody
- Watercourse

Ecological Land Classification

- FODM7 - Fresh – Moist Lowland Deciduous Forest Ecosite
- FODM7-4 - Fresh – Moist Black Walnut Lowland Deciduous Forest
- MAMM3-1/MEMM4 - Mixed Mineral Meadow Marsh Type/Fresh Moist Mixed Meadow
- MEMM3 - Dry - Fresh Mixed Meadow Ecosite
- OAG - Open Agriculture
- SWDM4-1 - Willow Mineral Deciduous Swamp Type
- SWTM3-6 - Mixed Willow Mineral Deciduous Thicket Swamp
- TAGM1 - Coniferous Plantation



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: ZJB
MAP CHECKED BY: KM
MAP PROJECTION: NAD 1983 UTM Zone 17N



PROJECT: 20-3135
STATUS: DRAFT
DATE: 2021-11-04

Figure 4: Site Investigation Results



MIDDLESEX COUNTY
BLACKS BRIDGE NATURAL
ENVIRONMENT SUMMARY

SITE INVESTIGATION RESULTS
FIGURE 4

- Study Area
- Blacks Bridge
- Inactive Cliff Swallow Nest
- Small Mammal Den
- Potential Seep
- Waterbody
- Watercourse

0 5 10 20 Meters

SCALE 1:1,250

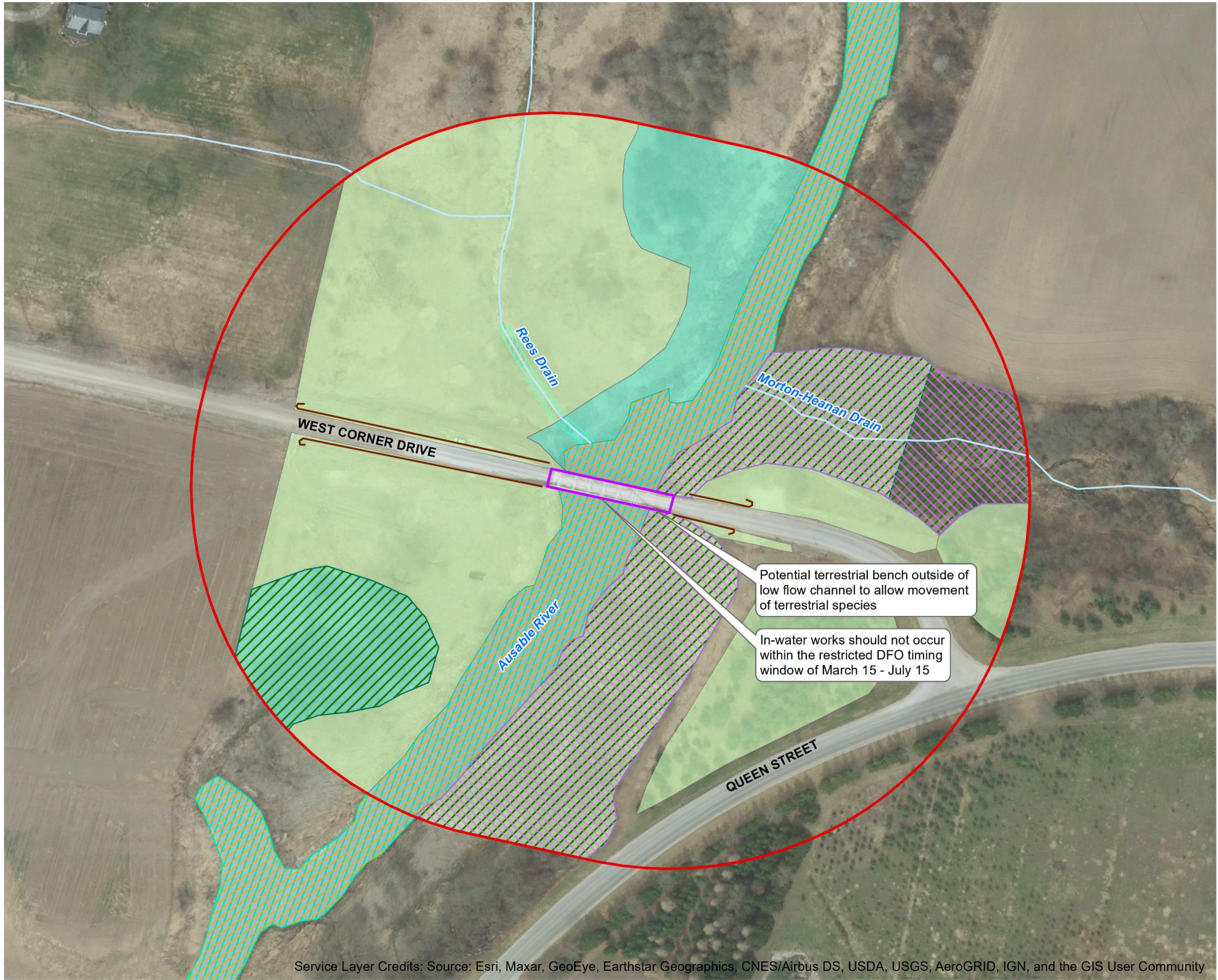
MAP DRAWING INFORMATION:
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MAP CREATED BY: ZJB
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MAP PROJECTION: NAD 1983 UTM Zone 17N



PROJECT: 20-3135
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Figure 5: Ecological Constraints and Opportunities



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



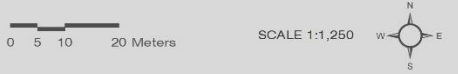
MIDDLESEX COUNTY
BLACKS BRIDGE NATURAL
ENVIRONMENT SUMMARY

**ECOLOGICAL CONSTRAINTS
AND OPPORTUNITIES**
FIGURE 5

- Study Area
- Blacks Bridge
- Potential Wildlife Fencing
- Potential Restoration Area
- Unevaluated Wetlands
- Significant Woodlands
- DFO Species at Risk Critical Habitat
- DFO Aquatic SAR and SCC
- Waterbody
- Watercourse

**Candidate Significant Wildlife
Habitat**

- Turtle Wintering Areas and SCC Turtle Habitat
- Eastern Wood-Pewee



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: ZJB
MAP CHECKED BY: KM
MAP PROJECTION: NAD 1983 UTM Zone 17N



PROJECT: 20-3135
STATUS: DRAFT
DATE: 2021-11-04

Appendix A

OP Schedules

COUNTY OF MIDDLESEX OFFICIAL PLAN

SCHEDULE C NATURAL HERITAGE FEATURES

Notations:

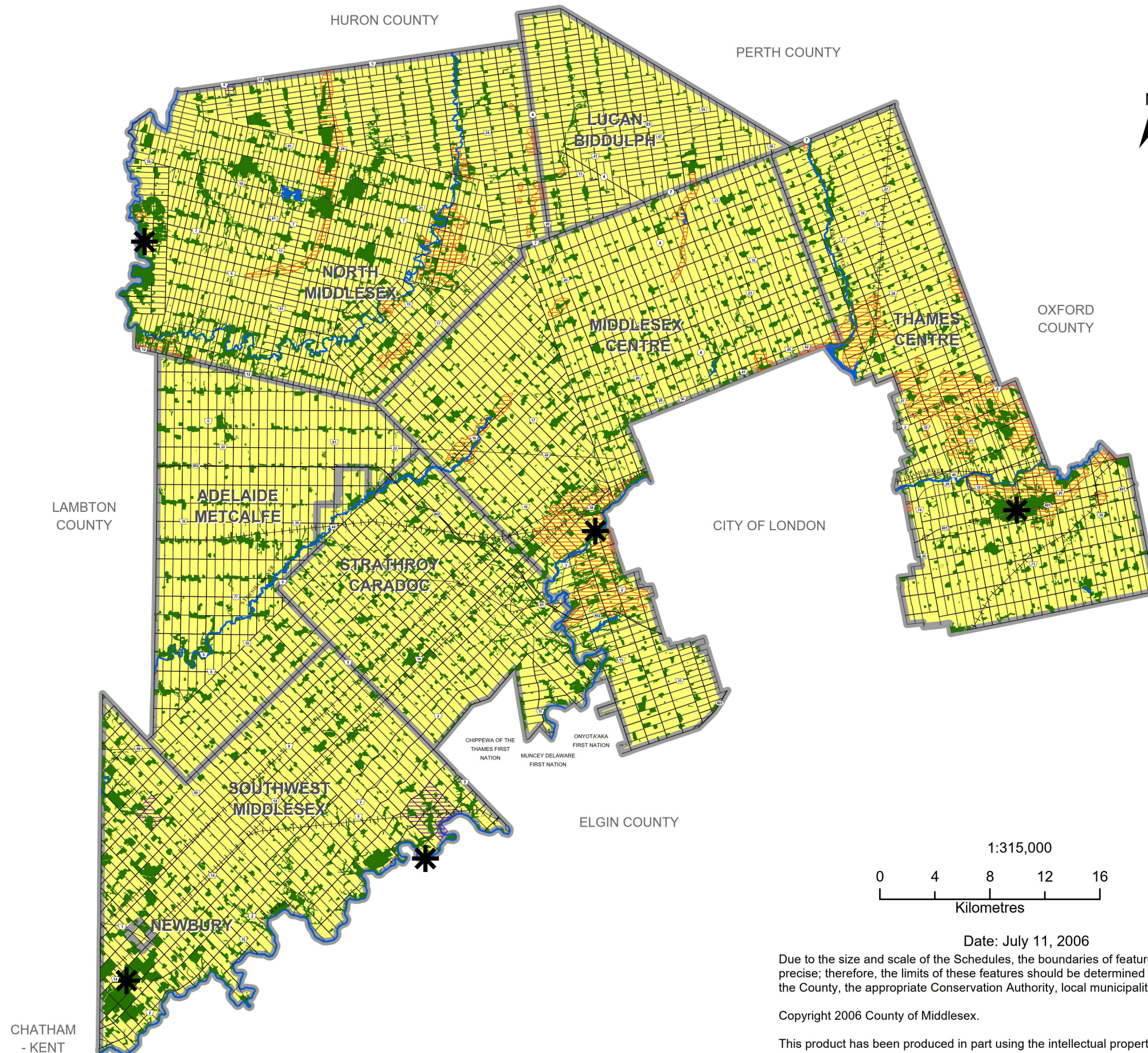
Schedule C should be read in conjunction with Schedules A and B and the text of the Official Plan.

The features shown on Schedule C represent a range of ecosystem elements which have been consolidated from a number of existing sources, the primary source being the Middlesex Natural Heritage Study (2003). Schedule C features do not preclude development; however, there is an interest in protecting them from incompatible development. These features have been shown on Schedule C as a means of reinforcing the policies outlined in the text which encourage their protection. The importance of these features shall be considered when land use changes and development decisions are proposed in, or adjacent to, these features.

Although there appears to be an absence of Aggregate Resource Areas in the Municipalities of Adelaide Metcalfe, Strathroy-Caradoc, Southwest Middlesex and Newbury; this is only as a result of incomplete aggregate mapping for the County. The Province should be consulted for more detailed information regarding the location of aggregate resources in these areas.

Schedule C Natural Heritage Features

-  Aggregate Resource Areas
-  Petroleum Resource Pool Areas
-  Significant Woodlands
-  Areas of Natural and Scientific Interest (ANSI)

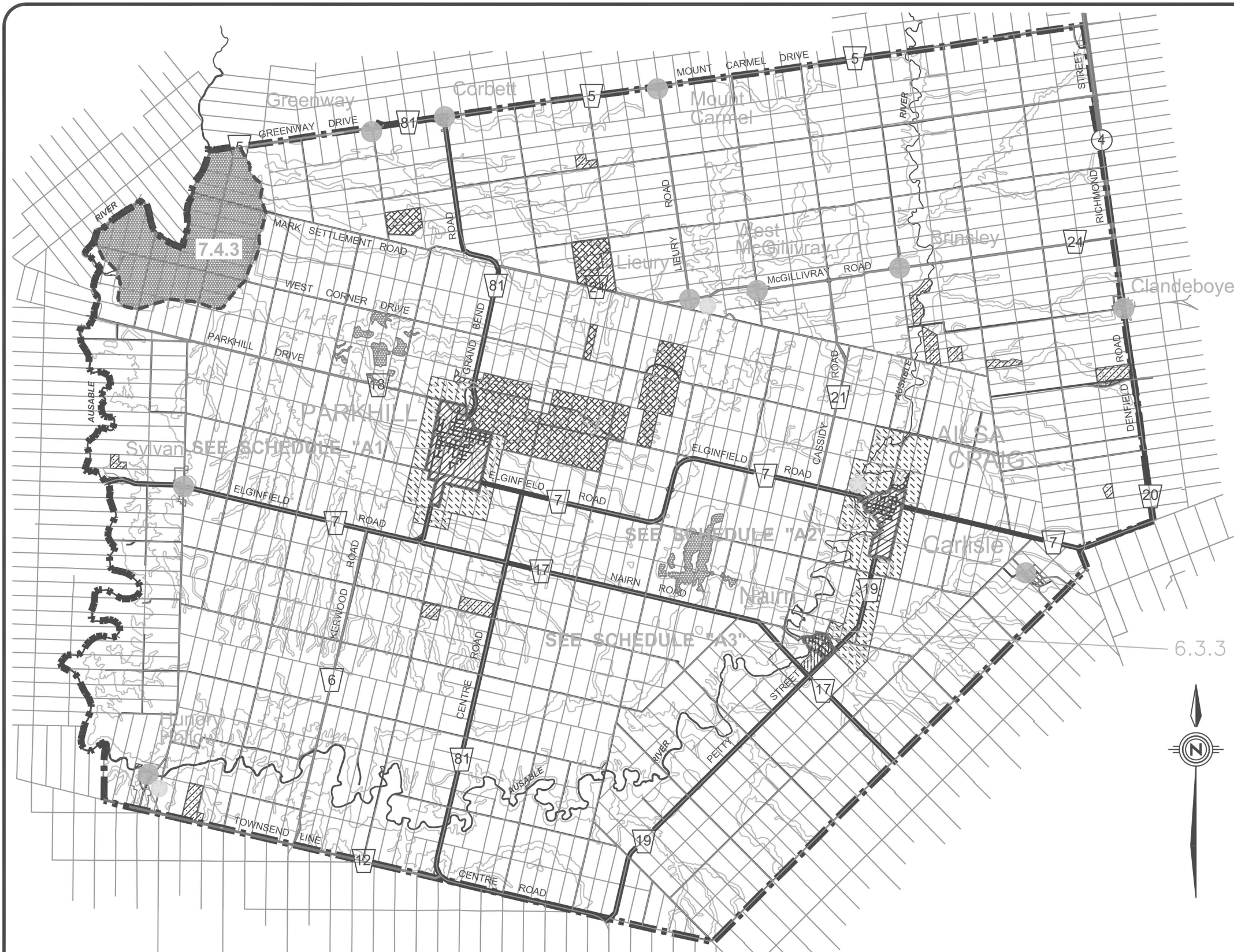


Date: July 11, 2006

Due to the size and scale of the Schedules, the boundaries of features may not appear to be precise; therefore, the limits of these features should be determined through consultation with the County, the appropriate Conservation Authority, local municipality and/or the Province.

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- LAND USE DESIGNATIONS:**
- HAMLET SETTLEMENT AREA
 - URBAN RESERVE AREA
 - AGRICULTURAL AREA
 - RESOURCE EXTRACTION AREA
 - OPEN SPACE AREA
 - SPECIAL POLICY AREA


- AREAS SUBJECT TO INSET LAND USE SCHEDULE:**
- URBAN SETTLEMENT AREA
 - COMMUNITY SETTLEMENT AREA

- LEGEND**
- MUNICIPAL BOUNDARY
 - HAZARD LANDS
 - ENVIRONMENTALLY SIGNIFICANT FEATURES
 - WASTE DISPOSAL SITE

SCHEDULE "A" SHALL BE INTERPRETED IN CONJUNCTION WITH SCHEDULES "B", AND "C" AND THE TEXT OF THE OFFICIAL PLAN.

THE BOUNDARIES OF FEATURES AND LAND USES ARE APPROXIMATE. PRECISE BOUNDARIES SHALL BE DETERMINED IN CONSULTATION WITH THE AUSABLE BAYFIELD CONSERVATION AUTHORITY AND THE MUNICIPALITY.

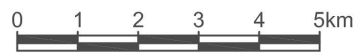
NOTE: THE AUSABLE RIVER AND PORTIONS OF THE LITTLE AUSABLE RIVER AND THEIR IMMEDIATE SURROUNDINGS PROVIDE OR CONTRIBUTE TO HABITAT FOR THREATENED OR ENDANGERED SPECIES AND ARE THEREFORE SUBJECT TO THE POLICIES OF SECTION 7.3.3.



MUNICIPALITY OF NORTH MIDDLESEX

**MUNICIPALITY OF NORTH MIDDLESEX
OFFICIAL PLAN**

Scale Bar



**SCHEDULE "A"
LAND USE
(RURAL AREA)**



ENVIRONMENTALLY SIGNIFICANT FEATURES:

- PROvincially SIGNIFICANT WETLANDS
- THEDFORD KLONDIKE MARSH FLOOD PLAIN

NATURAL HERITAGE FEATURES:

- LOCALLY SIGNIFICANT WETLANDS
- WOODLANDS
- SIGNIFICANT NATURAL AREAS
- AREAS OF NATURAL AND SCIENTIFIC INTEREST

NATURAL RESOURCE FEATURES:

- MINERAL AND AGGREGATE RESOURCES
- PETROLEUM RESOURCES

LEGEND

- MUNICIPAL BOUNDARY

SCHEDULE "C" SHALL BE INTERPRETED IN CONJUNCTION WITH SCHEDULES "A", AND "B" AND THE TEXT OF THE OFFICIAL PLAN.

SOURCE:
COUNTY OF MIDDLESEX, AUSABLE BAYFIELD CONSERVATION AUTHORITY, AND UPPER THAMES RIVER CONSERVATION AUTHORITY.

THE BOUNDARIES OF FEATURES ARE APPROXIMATE. PRECISE BOUNDARIES SHALL BE DETERMINED IN CONSULTATION WITH THE AUSABLE BAYFIELD CONSERVATION AUTHORITY AND THE MUNICIPALITY.

North Middlesex MUNICIPALITY OF NORTH MIDDLESEX

MUNICIPALITY OF NORTH MIDDLESEX OFFICIAL PLAN



SCHEDULE "C" **NATURAL HERITAGE AND NATURAL RESOURCE FEATURES**

Appendix B

Aquatic Site Photos

Photograph 1

General photo of the Ausable River. Facing upstream of Blacks Bridge, taken from the bridge.



Photograph 2

Ausable River - representative photo of the left bank riparian vegetation community (wet meadow) and coverage on the upstream side of the bridge. Taken facing upstream from the east side of the bridge.



Photograph 3

Ausable River – turbidity visible throughout the water column. Likely following a rainfall event.



Photograph 4

Riparian area on the right bank facing east towards the road. The floodplain was flattened due to high flows up to the steep hill approximately 15m from bank.



Photograph 5

Ausable River – representative photo of the upstream riparian vegetation community. Taken from the east side of the bridge on the right bank. Facing upstream.



Photograph 6

Taken from approximately 10m upstream of the bridge. Facing upstream. Representative photo of riparian vegetation communities on left and right banks.



Photograph 7

Inflow from small stream approximately 30m upstream of the bridge on the right bank. Watercress (groundwater indicator) found upstream of the inflow near Queen Street. Additional inflow source likely from agricultural drainage.



Photograph 8

Photograph of Blacks Bridge, Ausable River, taken from the right bank facing downstream.



Photograph 9

Taken from right bank, on the downstream side of the bridge facing left bank. Note* hydro lines may impact staging availability. If wires can be mitigated, recommend staging on left bank, downstream side of bridge.



Photograph 10

Substrate found along the left bank, downstream from the bridge. Dominant sand. Incidental gastropods.



Photograph 11

Vegetation community on the left bank, downstream from the bridge. Photo taken facing west towards agricultural field. Vegetation community includes mainly giant ragweed, grass species, willow species, and a few black walnut. Note* potential staging area if hydro wire can be mitigated



Photograph 12

Representative photo of the erosion on the right bank, downstream of the bridge. Photo taken from the left bank. Erosion is only evident on this bank. Erosion scar approximately 1.5m high from the water.



Photograph 13

Left bank, downstream from the bridge. Giant ragweed, willows, and reed canary grass.



Photograph 14

Left bank, upstream of bridge vegetation community >10m.



Photograph 15

Vegetation on left bank, downstream of bridge. Willows, grass species, and giant ragweed. Photo taken approximately 40m downstream of bridge facing downstream.



Photograph 16

Milfoil species found hanging in a tree (approx. 6 feet high) near the left bank. Indicative of high water levels and macrophyte presence in Ausable River.



Photograph 17

Willow swamp on left bank downstream from bridge. Moderately sized wetland area with standing water (no more than 10cm deep). No fauna identified. Likely a seasonally flooding area.



Photograph 18

Representative photo of Ausable River facing downstream. Taken from left bank.



Photograph 19

Representative photo of the of Ausable River, taken facing upstream from bridge.



Photograph 20

Representative Photograph of the Ausable River, taken facing downstream from middle of bridge.



Appendix C

Terrestrial Site Photos

Photograph 1

Corner of Queen
Street and West
Corner Drive



Photograph 2

Corner of Queen
Street and West
Corner Drive



Photograph 3

Heaman Tract

Coniferous
Plantation (TAGM1)
with manicured
hydro corridor
south of West
Corner Drive



Photograph 4

Manicured path
between Coniferous
Plantation (TAGM1)
and Black Walnut
Forest (FODM7-4)
south of West
Corner Drive



Photograph 5

Graminoid
Meadow Marsh
(MAMM1)
inclusion within
the Black Walnut
Forest (FODM7-4)
south of West
Corner Drive facing
up the slope



Photograph 6

Black Walnut
Forest (FODM7-4)
south of West
Corner Drive



Photograph 7

Mixed Meadow
(MEMM3) along
West Corner Drive



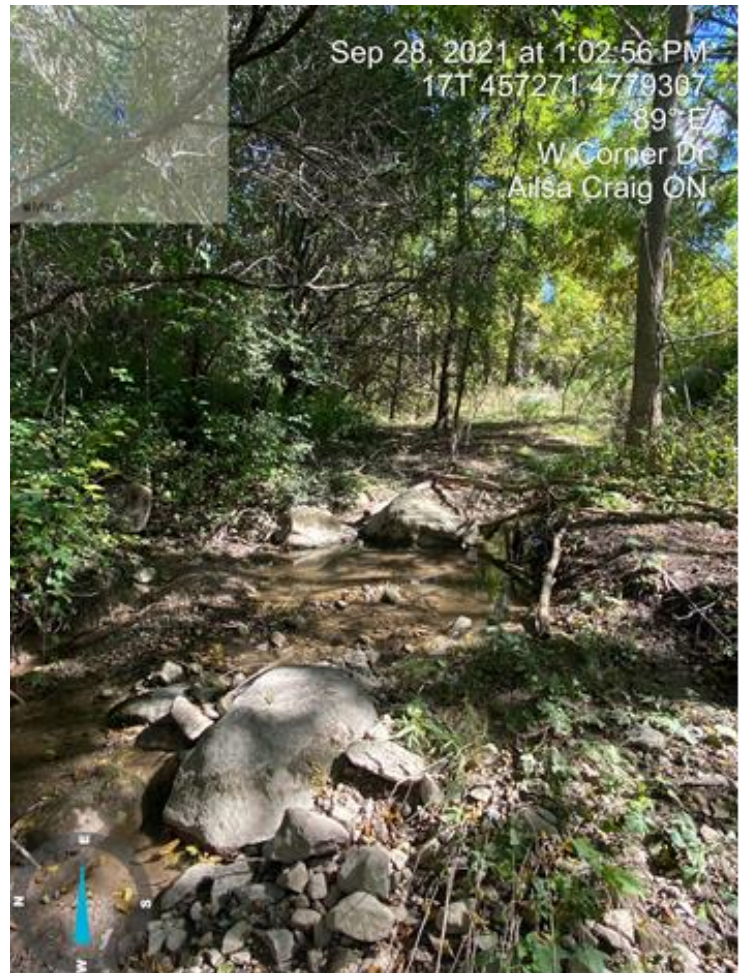
Photograph 8

Lowland Deciduous
Forest (FODM7)
north of West
Corner Drive



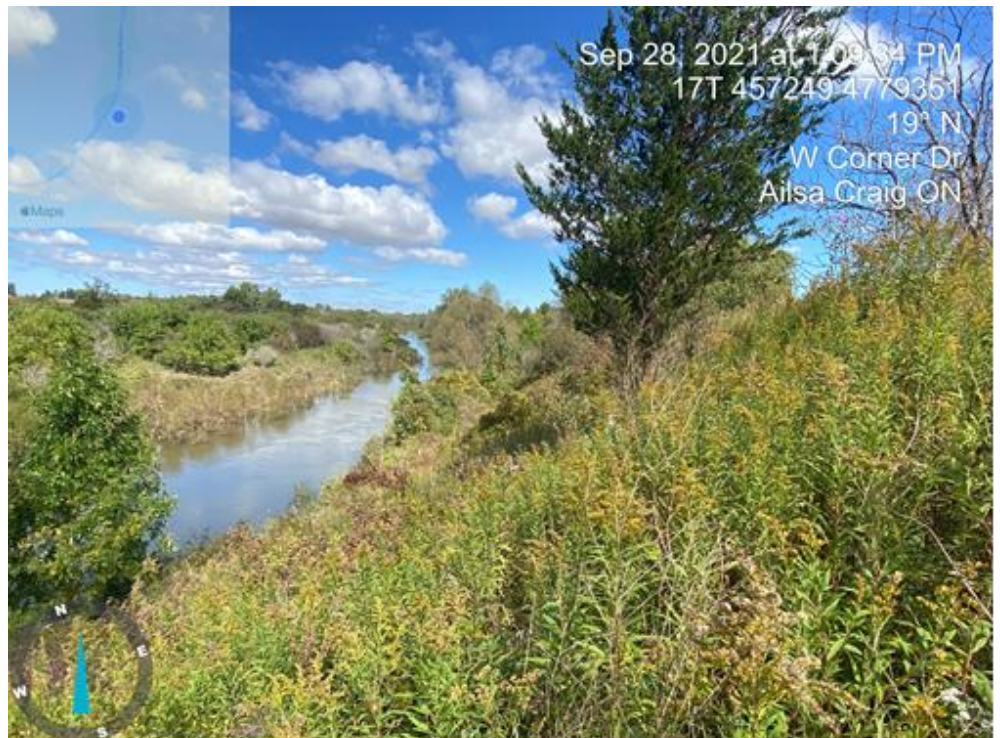
Photograph 9

Watercourse within Black Walnut Forest
(FODM7-4) north of West Corner Drive



Photograph 10

Mixed Meadow
(MEMM3) along steep
slope north of West
Corner Drive



Photograph 11

Mixed Meadow
(MEMM3) north
of West Corner
Drive



Photograph 12

Mixed Willow
Mineral
Deciduous
Thicket Swamp
(SWTM3-6)
northwest of
Blacks Bridge



Photograph 13

Mixed Meadow
Marsh (MAMM3-
1) / Fresh-Moist
Mixed Meadow
Complex
southwest of
Blacks Bridge



Photograph 14

Mixed Meadow
Marsh (MAMM3-
1) / Fresh-Moist
Mixed Meadow
Complex and
Willow Deciduous
Swamp (SWDM4-
1) southwest of
Blacks Bridge



Photograph 15

Underneath Blacks
Bridge, very limited
ledge on abutment
for any nesting



Photograph 16

Two inactive Cliff
Swallow nests on
ledge under bridge

