NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

April 13, 2022 2790

Scott Durnin
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1349 Western Road
London ON N6G 1H3

RE: 1349 Western Road, London
Focused Environmental Impact Study

Natural Resource Solutions Inc. (NRSI) was retained in February 2022 by Huron University College (hereafter 'Huron University') to complete a focused Environmental Impact Study (EIS) for a proposed parking lot development on the subject lands, located at 1349 Western Road, in the City of London, Ontario.

The subject lands (Map 1) are approximately 4.5ha in area, and are located on the west side of Western Road within the Huron University campus in London, Ontario. The subject lands are bounded to the east by Huron University Southwest Residence, to the south by Springett Parking Lot and a pedestrian walkway (Burnlea Walk), and to the west by the Huron University Wellness Centre. On the north boundary, the subject lands are adjacent to the Medway Valley Heritage Forest Environmentally Significant Area (ESA) and Significant Valleylands associated with Medway Creek, as per Map 5 of the City of London Official Plan (2021a). The subject lands are predominantly manicured lawn, parking lot, various Huron University buildings, and a tennis court, with trees interspersed along Burnlea Walk.

This EIS has been developed in accordance with the City of London's Environmental Management Guidelines (EMG) (City of London 2021b), and in agreement with the approved Environmental Study Scoping Checklist (ESSC) as determined in the meeting held with agency staff on March 31, 2022. For the purposes of this report, the term 'subject lands' refers to the property of interest owned by Huron University at 1349 Western Road, including the area of proposed development. The term "study area" refers to both the subject lands as well as lands within approximately 1km of the subject lands.

Through scoping meetings with the City of London, Huron University agreed to adhere to the recommended minimum buffers to Significant Woodlands (30m) in order to follow the 'Focused EIS' process, which waives the need for the completion of detailed field surveys and evaluation of significance.

As such, this Focused EIS includes a summary of the background review and scoping process, results of required field surveys, an assessment of potential environmental impacts and necessary mitigation/enhancement measures, as well as monitoring.

Project Scoping

Background information on the natural environmental features within the study area was gathered from the following sources:

- Upper Thames River Conservation Authority (UTRCA)
- Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF), Aylmer District
- City of London
- Natural Heritage Information Centre (NHIC) database (NDMNRF 2021a)
- Middlesex Natural Heritage System Study (UTRCA 2014)
- Medway Creek Watershed Report Card (UTRCA 2012)
- The London Plan (City of London 2021a)
- Medway Creek Community-Based Enhancement Strategy (Friends of Medway Creek and UTRCA 2009)
- Conservation Master Plan Phase II - Medway Valley Heritage Forest ESA (South) (Dillon Consulting 2018)
- Fisheries and Oceans Canada's Aquatic Species at Risk Maps (DFO 2021)
- Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada et al. 2008)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Butterfly Atlas (MacNaughton et al. 2018)
- Ontario Odonata Atlas (NDMNRF 2021c)

Species at Risk and Species of Conservation Concern

Wildlife species lists were compiled from background resources to provide information on species reported from the vicinity of the study area using the various atlases listed above. The atlases provide data based on 10x10km survey squares; information on species from the square that overlaps the study area was compiled (square 17MH77).
Based on these species lists, a number of Species at Risk (SAR) and Species of Conservation Concern (SCC) were identified as having records from within the vicinity of the study area. SAR are those listed on the Species at Risk in Ontario List (MECP 2021). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed by COSSARO as Endangered or Threatened are protected by the *Endangered Species Act* (ESA), 2007, which includes protection to their habitat, and are referred to herein as "regulated SAR".

Species considered Special Concern are included in the definition of SCC, which includes the following:

- species designated provincially as Special Concern,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the NHIC, and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC), but not provincially by the COSSARO. If these species are listed under the *Species at Risk Act* (SARA) under Schedule 1 they are protected by the federal Act, but not provincially by the ESA.

A number of these species have the potential to occur within the subject lands, as shown in Appendix I, although only candidate habitat for bat species is present within the area of proposed development.

Significant Wildlife Habitat
A screening for the presence of Significant Wildlife Habitat (SWH) was completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline document that outlines the types of habitats that the NDMNRF considers significant in Ontario, as well as criteria to identify these habitats (OMNR 2000, MNRF 2015). The SWHTG groups SWH into five broad categories: seasonal concentration areas, rare vegetation communities, specialized wildlife habitat, habitats of Species of Conservation Concern, and animal movement corridors. The SWH screening table is provided in Appendix II. A number of habitats have the potential to occur within the study area, but none overlap with the proposed development footprint.

Environmental Study Scoping Checklist
Based on the approach described above, the scope of the EIS was discussed during an initial consultation meeting held on February 22, 2022 between the proponent team, the City of London staff, and the City's Environmental and Ecological Planning Advisory Committee (EEPAC). The meeting was held to discuss the scope of the required ecological surveys, and a preliminary ESSC was completed. As identified above, Huron University agreed to adhere to a Focused EIS process, and a full ESSC meeting was completed on March 31, 2022. The final ESSC is provided in Appendix III, and was used to guide the scope of work provided in this report.

Field Methods and Results

As per the approved ESSC, field surveys were restricted to the completion of a woodland dripline assessment to establish the location of minimum buffers, as well as an assessment of potential habitat for SAR bats in areas where tree removal is proposed (along Burnlea Walk). In addition, a general review of SAR/SWH in the immediate vicinity of the development footprint was undertaken and any species observed during the site visit were recorded.
On April 6, 2022 NRSI biologists undertook the aforementioned field surveys, including the woodland dripline assessment, which forms the basis for the 30m Significant Woodland buffer (Map 2).

The Significant Woodland adjacent to the proposed development area is comprised of a canopy dominated by Sugar Maple (*Acer saccharum*) interspersed with occasional Black Cherry (*Prunus serotina*), Eastern Cottonwood (*Populus deltoides*), American Beech (*Fagus grandifolia*), Hackberry (*Celtis occidentalis*), Bitternut Hickory (*Carya cordiformis*), Bur Oak (*Quercus macrocarpa*), and Black Walnut (*Juglans nigra*) among other species. The understorey is largely dominated by Common Buckthorn (*Rhamnus cathartica*) and the ground cover also contains other invasive species including Common Privet (*Ligustrum vulgare*).

To address potential bat habitat presence within areas of tree removal, NRSI biologists undertook an assessment of suitable tree habitat features, including snags, cavities, and exfoliating bark in accordance with the NDMNRF protocols (OMNR 2011, MNRF 2017). The bat habitat assessment was completed during leaf-off conditions. NRSI biologists identified two candidate trees with potential bat roosting habitat; the locations of these trees are provided on Map 2. NRSI contacted the MECP to receive guidance on addressing potential habitat for bat SAR protected under the Endangered Species Act (2007). If the trees are to be removed during the bat active season, i.e., between April 1 and September 31, NRSI has proposed the completion of bat exit surveys and acoustic monitoring 24hrs prior to removal of these trees in order to confirm no negative impacts to these species or their habitat. If the trees can be removed outside of this timeframe, it is likely that no additional surveys are required.

During the site visit, all observations of wildlife were documented. This included actual direct observations of individuals, as well as signs of wildlife presence (i.e., tracks, scats, dens, nests etc.). All incidental species observations during field surveys, as well as species identified during initial background review of natural heritage information, have been included in species lists provided in Appendix IV-XI.

The adjacent Significant Woodlands provide a number of potential habitats for SAR as well as SWH as described in Appendices I and II, however, only habitat for bat SAR was found to be present within the proposed development area.

Proposed Undertaking and Impact Assessment

Proposed Undertaking

The proposed development is to include the expansion of existing parking areas northwards in order to facilitate and support the future construction of an additional residence in the current location of the existing 'Pay 'n Display Parking & Tour Parking' southeast of the existing 'Southwest Residence'. The proposed parking expansion will provide additional parkings spots in order to offset what is lost by the placement of the proposed residence. The existing tennis court which straddles the 30m buffer will be removed as part of this work. Stormwater management for the proposed parking lot is anticipated to be tied into the existing outlets and will be further assessed as part of the anticipated EIS for the new residence.

Net Effects Table

NRSI has prepared a list of potential impacts associated with the proposed development of the subject lands. These impacts, along with possible avoidance, mitigation, and/or compensation measures, have been summarized in a Net Effects Table (Table 1), as per the requirements of the City of London's EMG (City of London 2021b).

Table 1. Net Effects Table for 1349 Western Road Focused EIS

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
1.0 Existing Impacts			
1.1 Lawn under Woodland Dripline	Manicured lawn - Prevention of seed dispersal from woodland edge. Prevention of establishment of native vegetation communities in buffers.	Enhancement plantings within the 30m buffer to complement the existing woodland community associated with Medway Creek ESA.	(+) NET POSITIVE EFFECT Implementation of buffers and enhancement plantings will provide greatly enhanced vegetation community and wildlife habitat.
1.2 Invasive species within woodland	Woodland - Buckthorn is pervasive through the understorey of the woodland associated with the ESA. Suppression of native seed recruitment for trees and shrubs within the understorey.	Monitoring of enhancement plantings within 30m buffer to ensure successful establishment. If required, active removal of invasive plant species to allow for greater establishment (as determined during post-construction monitoring). Native plantings impacted due to invasive encroachment will be replaced during the 2-year warranty period.	NO NET EFFECT No removals of invasive species within the woodland are currently planned.
2.0 Direct Impacts			
2.1 Tree removal	Burnlea Walk - Removal of approximately 12 large trees from the walkway that will result in reduction in canopy	Implement Tree Preservation Plan (TPP) to identify individual trees to be removed and retained as well as necessary compensation, in accordance with the City of London's tree bylaw (Bylaw C.P. 1555-252).	(-) NET NEGATIVE IMPACT (SHORT-TERM) (+) NET POSITIVE EFFECT (MEDIUM/LONG-TERM)

	cover, carbon sequestration, some habitat for wildlife (nesting birds, insects, small mammals, possibly bats).	Establish Tree Protection Fencing prior to construction activities, at minimum of the dripline +1m for any isolated trees to be retained. Enhancement planting of native tree and shrub plant species within the 30m buffer, as well as a native seed mix. Bird nest searches for any vegetation clearing during the primary nesting period (April 1-August 31). Bat acoustic monitoring of any trees with candidate bat habitat proposed for removal during the bat active period (April 1-September 30).	Compensation planting will provide greatly enhanced habitat in terms of tree cover and wildlife habitat following maturation.
2.2 Removal of Candidate Bat Trees	Burnlea Walk – Removal of two trees identified as candidate bat cavity habitat, resulting in loss of candidate bat habitat.	Prior to tree removal within the bat active season (April 1 - September 30), exit surveys and acoustic monitoring to be undertaken to confirm absence of bats. MECP has been contacted for input on additional mitigation measures.	<u>NO NET EFFECT</u> Monitoring of trees prior to removal to ensure no bat usage.
2.3 Natural Feature	Woodland edge – Damage to branches or soil compaction of roots	No encroachment within the established 30m Significant Woodland Buffer. Fence off 30m buffer prior to any site works. Post-construction monitoring of natural features on subject lands to ensure no lasting damage caused by construction.	<u>NO NET EFFECT</u> Potential impact to natural features on site can be mitigated or avoided with proper mitigation measures.

3.0 Indirect Impacts			
3.1 Increase in impervious surfaces	Manicured lawn, Woodland – Potential reduction in groundwater infiltration and increased runoff on subject lands.	Stormwater to be reviewed as part of a larger drainage assessment associated with the anticipated EIS for the proposed residence development. In general, it is anticipated that drainage will be tied into existing outlets.	<u>NO NET EFFECT</u> Potential impacts to runoff, infiltration can be mitigated with proper management measures.
3.2 Wildlife movement	Woodland – Potential for wildlife movement across subject lands and the adjacent ESA to be disrupted by construction activities.	Limit construction to daylight hours (approximately 7am-7pm). No encroachment within the established 30m Significant Woodland Buffer.	<u>NO NET EFFECT</u> Potential impacts to wildlife movement can be mitigated with timing and spatial restrictions to construction. Developed nature of subject lands already precludes much wildlife movement across the site.
3.3 Sediment erosion	Woodland – Erosion of exposed soil can cause sediment-laden surface runoff, impairing water quality of enhancement plantings and adjacent ESA.	Grading or other soil disturbing events should be timed outside of seasonally wet periods and high precipitation events (20mm in 24hrs). Erosion and sediment control fence is to be installed at the limit of the 30m Significant Woodland buffer prior to the start of construction.	<u>NO NET EFFECT</u> Erosion impacts can be mitigated or avoided with proper management measures.

3.4 Lighting	Woodland – Lighting from construction activities may disrupt wildlife movement and behaviour.	Any lighting equipment associated with construction activities should be turned off following cessation of daily construction activities. Lighting should be turned away from adjacent natural features so as to prevent 'lightwash'.	NO NET EFFECT Lighting impacts can be mitigated or avoided with proper management measures.
3.5 Noise disturbance	Woodland – Noise from construction activities may disrupt wildlife movement.	Noise impacts can be mitigated by restricting daily timing of construction activities to between 7:00 am and 7:00 pm.	NO NET EFFECT Noise impacts can be mitigated or avoided with proper management measures.
3.6 Dust and particulate	Woodland – Dust and particulate generated by construction activities can reduce vegetation health and disrupt wildlife.	Moistening areas of bare, dry soil with water as needed during construction activities to reduce the amount of dust produced.	NO NET EFFECT Particulate impacts can be mitigated or avoided with proper management measures.
3.7 Construction equipment maintenance	Woodland – Contaminant spills caused by washing, refueling and/or servicing construction machinery.	Construction equipment storage will be maintained off of subject lands. Maintenance to construction equipment will be restricted to outside of the buffer areas (30m away from the Significant Woodland edge). Follow the City of London's endorsed Clean Equipment Protocol (Halloran et al. 2013).	NO NET EFFECT Potential negative impacts by construction maintenance can be mitigated with proper training and protocols.

4.0 Induced Impacts			
4.1 Human disturbance	Woodland – Disturbance to the buffer and associated native plantings, disruption of wildlife movement.	Dense plantings within encroachment buffer should dissuade human traffic across area. If human disturbance continues within buffers (as determined by post-construction monitoring), deterrents such as temporary fencing or notice signs may be required.	<u>NO NET EFFECT</u> Potential impacts by human disturbance can be mitigated with proper deterrents and information.

Environmental Management Plan

NRSI has prepared an Environmental Management Plan (EMP) to address the potential impacts of the proposed development of the subject lands identified following field surveys. These recommendations are intended to mitigate and/or compensate for potential detrimental effects to the Significant Woodland, ESA, and other natural heritage features.

Enhancement Buffer

A 30m ecological buffer will be maintained between the proposed development and the Medway Creek Heritage Forest ESA woodland along the north edge of the subject lands.

The ecological buffer will be enhanced through plantings of native tree and shrub species following construction. Any areas within the 30m buffer that are disturbed during installation should be seeded with a native meadow seed mixture. However, broadscale tilling/removal of grass from the 30m buffer area is not recommended since tree root zones may be impacted, invasive species could be introduced by machinery, and the current layer of grass is acting as a temporary barrier to establishment of invasive species such as buckthorn from the adjacent ESA area.

The existing tennis court is to be removed and the area of disturbed soil re-seeded with a native meadow seed mix and additional tree/shrub plantings. It is recommended that this work be undertaken prior to other tree/shrub enhancement plantings to avoid soil compaction and potential impacts of equipment.

Plantings will be established within the ecological buffer to provide a buffer of vegetative cover between the subject lands and the ESA, with the goal of providing enhanced wildlife habitat and movement while simultaneously discouraging human foot traffic in the area. A list of recommended native plants for the ecological buffer can be found in Table 2. These species were found to be abundant in the adjacent Significant Woodland and will complement this feature well.

Table 2. Recommended Native Plant Species for Enhancement Planting

Species	Common Name
Acer saccharum	Sugar Maple
Celtis occidentalis	Hackberry
Cornus alternifolia	Alternate-leaf Dogwood
Prunus serotina	Black Cherry
Prunus virginiana	Choke Cherry
Quercus rubra	Red Oak
Tilia americana	American Basswood

Monitoring

The proposed monitoring program is to be established in order to monitor the effectiveness of the proposed mitigation and enhancement measures both during and following construction. Contingency measures have been provided where possible, with the understanding that this site will be adaptively managed to ensure the success of proposed mitigation and enhancement measures.

During Construction:

- Erosion and sediment fence monitoring to ensure soil disturbance from construction is mitigated, and apply sediment control measures if runoff enters natural areas. To be undertaken during periods of thaw and high precipitation events (≥20mm in 24hrs);
- Tree Protection Fence monitoring to ensure no encroachment. Pruning or trimming of trees damaged during construction activities to prevent further damage and stimulate recovery will be conducted as needed;
- Tree and vegetation removal to avoid the core bird nesting period (April 1- August 31) where possible. If this is not possible, avian nest searches are to be undertaken prior to any cutting or grubbing or vegetation (CWS 2013). Similarly, if tree removal of bat candidate trees does not respect the bat active period (April 1- September 30), then monitoring of these trees is to be undertaken prior to tree cutting;

Post-Construction:

- Monitoring of post-construction impacts and the success of buffer enhancement plantings are to be undertaken at the end of the 2-year warranty period and will include the following:
    - Monitoring of the success of planted native tree and shrub species within the 30m buffer. During monitoring events, the success of earlier plantings will be assessed to ensure establishment of native stock;
    - Review of invasive species impacts. During the monitoring at the end of the 2-year period, biologists will assess whether invasive species such as Common Buckthorn are becoming established within the buffer areas and whether this is impacting the planted stock. It is recommended that biologists carry a tree wrench to remove any small buckthorn shrubs that are present within these areas to prevent future spread. Depending on the degree of impacts, biologists will recommend follow-up action that could include herbicide application (Garlon Ready-to-use) or other treatment of Buckthorn; and
    - Monitoring for human disturbance. Should human foot traffic, ad hoc trails, dumping of waste/refuse be noticed within the buffer area, mitigation measures such as signage or temporary fencing should be considered until native vegetation establishes.

Summary

The proposed parking lot construction at 1349 Western Road will be located entirely outside of the established Significant Woodland buffer (30m). This Focused EIS provides an assessment of potential impacts from the construction and long-term presence of the parking lot at this site along with mitigation and enhancement measures to ensure that the adjacent Significant Woodland associated with Medway Valley ESA is not impacted by the proposed undertaking. The post-construction monitoring plan has been designed to monitor the effectiveness of these measures, including the establishment of buffer enhancement plantings. Providing the measures detailed within this Focused EIS are adhered to, no negative impacts are anticipated as a result of the proposed undertaking, and indeed, enhanced habitat will be provided for wildlife in the medium to long-term as buffer areas begin to establish.

Should you have any questions or comments regarding this Focused EIS, please do not hesitate to contact me.

Sincerely,

Natural Resource Solutions Inc.

Nathan Miller, M.Sc., P.Biol
Senior Biologist

References

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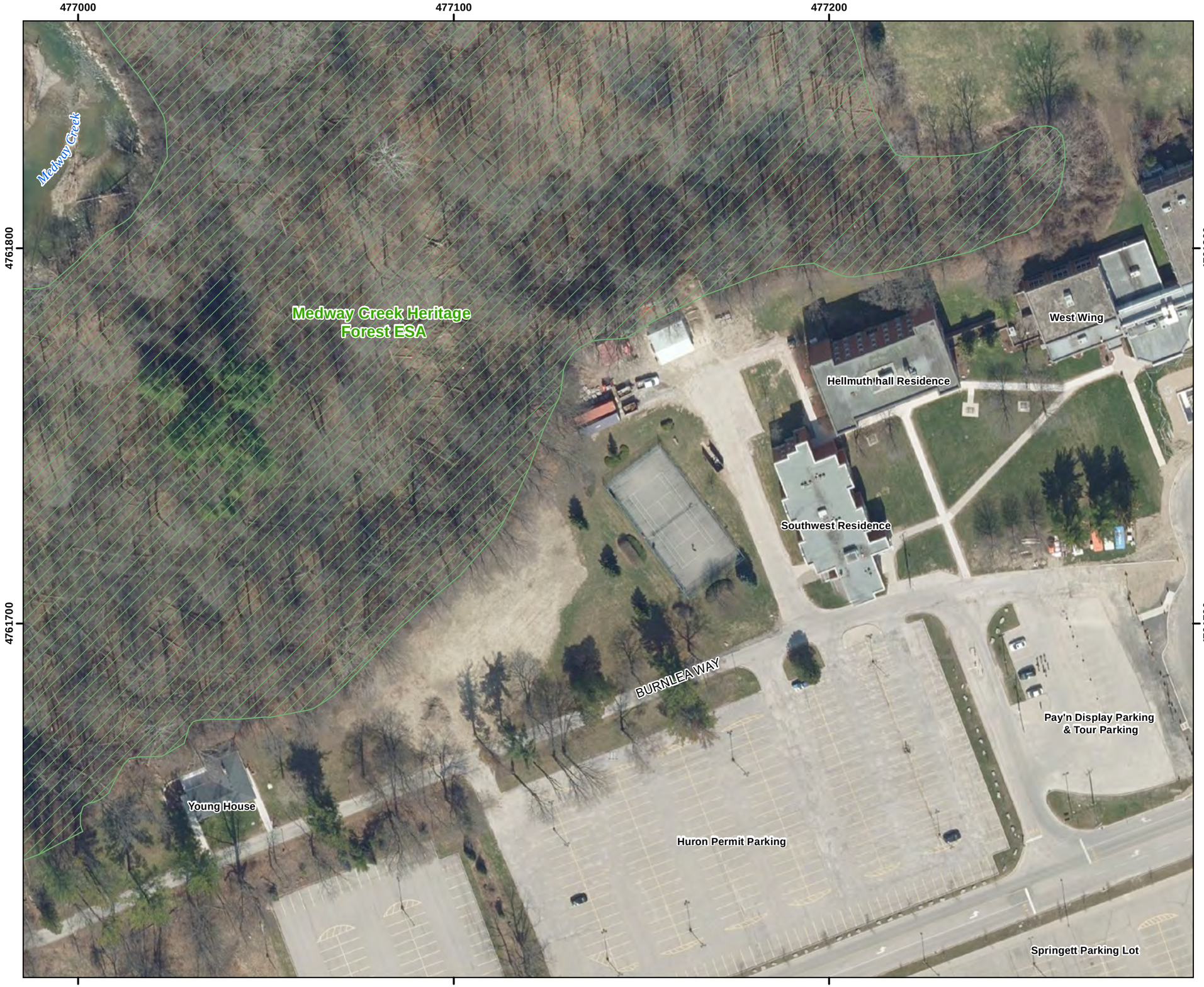
Maps



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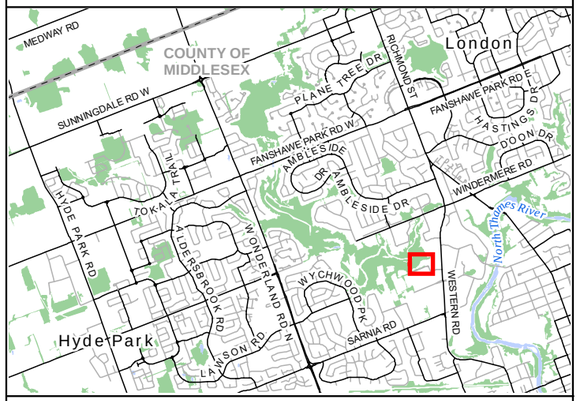
Map 1

1349 Western Road

Subject Lands



Legend

Medway Creek Heritage ESA

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2790
Date: April 13, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

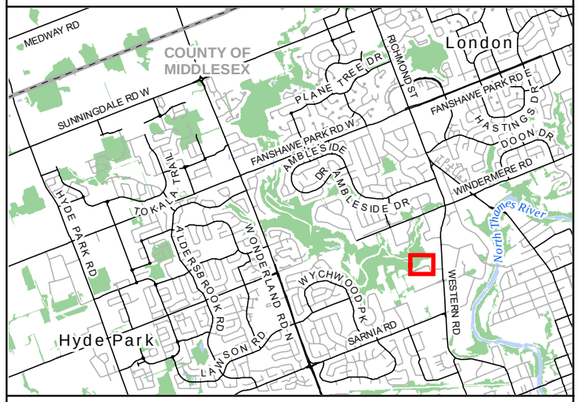
0 20 40 60 Metres

N

Map 2

1349 Western Road
Focused EIS

Natural Heritage Features and Parking Lot Development



Legend

- Candidate Bat SAR Tree (BAT)
- Significant Woodland Buffer (30m)
- Woodland Dripline (NRSI Surveyed April 6, 2022)

Proposed Development

- Parking Lot Development

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2790 Date: April 13, 2022	NAD83 - UTM Zone 17 Size: 11x17" **1:1,000**

0 20 40 60 Metres

N

477000 477100 477200

4761800 4761700 4761600

Medway Creek

Medway Creek Heritage Forest ESA

West Wing

Hellmuth hall Residence

Southwest Residence

BURNLEA WAY

BAT-002

BAT-001

Young House

Huron Permit Parking

Pay'n Display Parking & Tour Parking

Springett Parking Lot

Path: X:\2790_1349WesternRoad\NRSI_2790_Map2_NaturalHeritageFeatures_1K_2022_04_13_JX.mxd

Appendix I
Species at Risk and Species of Conservation Concern Habitat Assessment

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Observed by NRSI	Habitat Preference4,5	Suitable Habitats within Subject Property	Rationale
Birds										
Progne subis	Purple Martin	S3B					No	Open, trees areas such as farmland, parks, yards, marshes; usually near large bodies of water; colonial; nests in tree cavities, cliff ledges; most common in nest boxes; requires open space for foraging; prefers trees >15 cm dbh.	**Yes**	Open treed area with cultured meadow present within the subject lands
Chlidonias niger	Black Tern	S3B, S4M	SC	NAR	NS	No schedule	No	Large cattail marshes; marshy edges of rivers, lakes or ponds; wet open fens; wet meadows. Returns to same area to nest each year. Must have areas of shallow water (0.5 to 1m deep) and area of open water near nests. Generally found in marshes >20 ha in size.	No	Suitable habitat is not present within the subject lands
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	No	Commonly found in urban areas near buildings; nests in chimneys, hollow trees,and crevices of rock cliffs. Feeds over open water.	No	Suitable habitat is not present within the subject lands
Chordeiles minor	Common Nighthawk	S4B	SC	SC	T	Schedule 1	No	Open ground; clearings in dense forests (including burns and logged areas); rock barrens; peat bogs; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	No	Suitable habitat is not present within the subject lands
Colinus virginianus	Northern Bobwhite	S1?B	END	E	E	Schedule 1	No	Grassland, prairie or hay fields with woody cover in form of thickets, tangles of vines, shrubs; fence rows or woodland edges; cropland growing corn, soybeans or small grains and clover or grass; well-drained sandy or loamy soil; pond edges.	No	Suitable habitat is not present within the subject lands
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	No	Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation.	**Yes**	Wooded areas present within the subject lands
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	No	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occassionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario.	No	Suitable habitat is not present within the subject lands
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	No	Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.	No	Suitable habitat is not present within the subject lands
Sturnella magna	Eastern Meadowlark	S4B, S3N	THR	T	T	Schedule 1	No	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.	No	Suitable habitat is not present within the subject lands
Reptiles and Amphibians										
Apalone spinifera	Eastern Spiny Softshell	S2	END	E	E	Schedule 1	No	Large rivers and lakes, as well as seasonally in streams, creeks, marshes, ponds, and oxbows, especially those near large rivers or lakes. Key habitat requirements: open areas for basking with basking structures, open sand or gravel nesting areas, shallow muddy or sandy substrates to bury in, deep pools for hibernation. These habitats may be spread over a large area as long as the turtles can travel between them.	No	Suitable habitat is not present within the subject lands
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	No	Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation.	No	Suitable habitat is not present within the subject lands
Graptemys geographica	Northern Map Turtle	S3	SC	SC	SC	Schedule 1	No	Large bodies of water such as rivers and lakes with soft bottoms, aquatic vegetation, abundant mollusc prey, and basking structures such as logs or rocks. Nesting occurrs in open areas with soft substrates such as sand or gravel. Hibernate on the bottom of deep areas of lakes or deep, slow-moving sections of rivers.	No	Suitable habitat is not present within the subject lands
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	T	Schedule 1	No	Open habitats, such as open woods, brushland or forest edges, with well-drained loose or sandy soils, well-drained substrates. Specializes in hunting and eating toads; occurs in habitats near or adjacent to wetland habitats where toads are present. Rocks, logs, stumps, etc. are used for shelter. Use snout to dig nests as well as to dig burrows for overwintering.	No	Suitable habitat is not present within the subject lands
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1	No	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.	No	Suitable habitat is not present within the subject lands
Regina septemvittata	Queensnake	S2	END	E	E	Schedule 1	No	Rivers, streams and lakes with clear water, rocky or gravel bottoms, and an abundance of crayfish. Also in marsh and wetland habitats. Rarely found more than 5m from a shoreline. Requires shelter and basking objects both in the water and on shore such as rocks, logs, and vegetation. Hibernation sites include crevices or fissures in bedrock, small mammal burrows, openings along tree roots, or abutments of old bridges.	No	Suitable habitat is not present within the subject lands
Mammals										
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	No	Uses caves, quarries, tunnels, hollow trees or buildings for roosting. Winters in humid caves. Maternity sites in dark warm areas such as attics and barns. Feeds primarily in wetlands and forest edges.	**Yes**	Two cavity trees along the southern edge f the subjhect lands may provide suitable habitat for SAR bat species
Butterflies										
Asterocampa celtis	Hackberry Emperor	S3					No	Found along wooded streams, forest glades and river edges, wooded roadsides, towns where hackberries, their exclusive caterpillar host plants, are common but it also may be found in upland areas.	**Yes**	Wooded areas with hackberry plants present within the subject lands
Asterocampa clyton	Tawny Emperor	S3					No	Found in densely wooded riparian areas, dry woods, open woods, cities, fencerows, parks where hackberries, their exclusive caterpillar host plants, are common.	No	Suitable habitat is not present within the subject lands
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	No	Adults found in a diversity of habitats with a variety of wildflowers. Caterpillars are confined to meadows and open areas where milkweeds grow (larval food plants).	Possibly	Potentially suitable habitat is present within the subject lands
Erynnis brizo	Sleepy Duskywing	S1					No	Found along dry woodland edges and openings where their host plants, Scrub oak (Quercus ilicifolia) and other shrubby oaks occur.	Possibly	Potentially suitable habitat is present within the subject lands
Fish										
Lepomis peltastes pop. 2	Northern Sunfish (Great Lakes - Upper S	S3	SC	SC	SC	Schedule 1	No	Found in shallow, vegetated areas of warm lakes, ponds, and slowly flowing watercourses with clear water, and sand or gravel substrate.	No	Suitable habitat is not present within the subject lands
Moxostoma duquesnei	Black Redhorse	S2	THR	T	T	Schedule 1	No	Pools and riffle areas of medium-sized rivers and streams, usually less than two metres deep. Usually few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, adults migrate to breeding habitat where eggs are laid on gravel in fast water.	No	Suitable habitat is not present within the subject lands
Notropis photogenis	Silver Shiner	S2S3	THR	T	T	Schedule 1	No	Moderate to large size streams with swift currents, free of weeds, with clean gravel or boulder bottoms. Gravel riffles needed for spawning (June-July).	No	Suitable habitat is not present within the subject lands

Appendix II
Significant Wildlife Habitat Assessment

Significant Wildlife Habitat Assessment: Ecoregion 7E.

Table 7. Significant Wildlife Habitat Screening for 1349 Western Road

Significant Wildlife Habitat Type	Suitable Habitat Present Within Study Area?*	Suitable Habitat Present Within Subject Lands?*	Assessment Details
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Areas (Terrestrial)	No	No	Flooded fields not present within Study Area
Waterfowl Stopover and Staging Areas (Aquatic)	No	No	Ponds, marshes, lakes, bays, coastal inlets, not present within Study Area. Medway Creek is located immediately adjacent, but is of insufficient size/composition to support large numbers of staging waterfowl.
Shorebird Migratory Stopover Area	No	No	Shorebird Stopover habitat in southern Ontario is largely associated with the Great Lakes and large wetlands or rivers. The creek is heavily forested and does not contain suitable shorebird stopover habitat.
Raptor Wintering Area	No	No	Insufficient upland meadow habitat in close proximity to woodlands.
Bat Hibernacula	No	No	Caves, mine shafts, underground foundations and Karsts not present within Study Area.
Bat Maternity Colonies	Possible	No	Woodland habitat within the Medway Valley ESA may provide suitable habitat for this SWH.
Turtle Wintering Area	Possible	No	The creek within Study Area may be deep enough to serve as a turtle wintering area.
Reptile Hibernaculum	Possible	No	Burrows, rock crevices and other natural locations suitable as reptile hibernaculum may be present within the Study Area.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	No	No	Areas with exposed soil banks, undisturbed or naturally eroding, are likely not present within the Study Area.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	No	No	Wetlands, lakes, islands, and peninsulas not present within the Study Area.
Colonially - Nesting Bird Breeding Habitat (Ground)	No	No	Rocky island or peninsula (natural or artificial) within proximity of a lake or large river not present withing ht Study Area.
Migratory Butterfly Stopover Areas	No	No	Study Area not within 5km of Lake Erie.
Landbird Migratory Stopover Areas	No	No	Study Area not within 5km of Lake Erie.
Deer Winter Congregation Areas	No	No	Woodlands within Study Area of insufficient size and composition.
Rare Vegetation Communities			
Cliff and Talus Slopes	No	No	Cliffs and Talus Slopes not present within Study Area.
Sand Barrens	No	No	A sand barren area not present within Study Area.
Alvar	No	No	Alvar not present within Study Area.
Old Growth Forest	Possible	No	Woodlands which are part of the Medway Creek ESA are within the Study Area and may meet the criteria for 'Old Growth'.

Significant Wildlife Habitat Assessment: Ecoregion 7E.

Table 7. Significant Wildlife Habitat Screening for 1349 Western Road

Significant Wildlife Habitat Type	Suitable Habitat Present Within Study Area?*	Suitable Habitat Present Within Subject Lands?*	Assessment Details
Tallgrass Prairie	No	No	Tallgrass Prairies not present within Study Area.
Savannah	No	No	Savannah Tallgrass Prairies not present within Study Area.
Other Rare Vegetation Communities	Possible	No	Possible rare vegetation communities in Medway Creek ESA within Study Area.
Specialized Wildlife Habitat			
Waterfowl Nesting Area	No	No	Wetlands and waterfowl nesting area likely not present within Study Area.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Possible	No	Potential for Osprey/ Bald Eagle nest within Study Area.
Woodland Raptor Nesting Habitat	No	No	Woodlands which are part of the Medway Creek ESA are within the Study Area, but do not contain sufficient interior forest habitat for raptor nesting.
Turtle Nesting Areas	Possible	No	Possible habitat for Midland Painted Turtle and Snapping Turtle within Study Area.
Seeps and Springs	Possible	No	Possibility for Seeps/Springs within Study Area.
Amphibian Breeding Habitat (Woodland)	No	No	No wetlands or standing water within the Study Area to support breeding amphibians.
Amphibian Breeding Habitat (Wetland)	No	No	No wetlands or standing water within the Study Area to support breeding amphibians.
Woodland Area-Sensitive Bird Breeding Habitat	No	No	No interior woodland habitat within the Study Area.
Habitat for Species of Conservation Concern			
Marsh Bird Breeding Habitat	No	No	Wetland habitat not present within Study Area.
Open Country Bird Breeding Habitat	No	No	Large Grassland Area >30ha not present within Study Area.
Shrub/Early Successional Bird Breeding Habitat	No	No	Large natural field areas succeeding to shrub and thicket habitats >10ha not present within Study Area.
Terrestrial Crayfish	No	No	Wet meadow and edges of shallow marshes not present within Study Area.
Special Concern and Rare Wildlife Species	Possible	No	Potential for Special Concern and Provincially Rare (S1-S3, SH) plant and animal species within Study Area.
Animal Movement Corridors			
Amphibian Movement Corridors	No	No	No wetlands or standing water within the Study Area to support breeding amphibians.
Exceptions			

Significant Wildlife Habitat Assessment: Ecoregion 7E.

Table 7. Significant Wildlife Habitat Screening for 1349 Western Road

Significant Wildlife Habitat Type	Suitable Habitat Present Within Study Area?*	Suitable Habitat Present Within Subject Lands?*	Assessment Details
Bat Migratory Stopover Area	No	No	Long distance migratory bat stopover area not present within Study Area

*'Possible' SWH means that the SWH has the potential to occur but Candidate habitats have not been identified, 'Candidate' SWH means that the habitat is present but has not been studied to determine significance, 'Confirmed' SWH means that the SWH has been assessed and determined to be significant.

Appendix III
Scoping Checklist

APPENDIX B - Environmental Study Scoping Checklist

Application/Project Name: _____

Proponent: _____ **Date:** _____

Proposed Project Works: _____

Study Type: _____

Lead Consultant: _____

Key Contact: _____

Subconsultants: _____

Technical Review Team:

☐ Ecologist Planner: _____ ☐ Province – Species at Risk: _____

☐ Planner for the File: _____ ☐ Province - Other: _____

☐ Conservation Authority: _____ Contact: _____

☐ EEPAC: _____ ☐ Other: _____

☐ Project Manager, Environmental Assessment:_____

☐ First Nation(s): _____

Subject Lands and Study Area:

Location/Address and Size (ha) of Subject Lands:

_____

Study Area Size (approximate ha): _____ ☐ Map (attached): _____

Position of Site in Subwatershed: _____

Tributary Fact Sheet:_____

Is the proposed location within the vicinity of the Thames River (<120 m)? ☐ Yes ☐ No

If Yes, initiate engagement with local First Nation communities. Consultation activity to be provided at Application Review stage.

Policy:

☐ Study must demonstrate how it conforms to the Provincial Policy Statement

☐ Study must demonstrate how it conforms to *The London Plan*

Map 1 Place Types:

☐ Green Space ☐ Environmental Review

Other Place Types: _____

Map 4 Active Mobility Network:

☐ Pathway placement and future trail accesses shall be considered as part of this study.

Map 5 Natural Heritage System:

(Subject Lands and Study Area delineated on current aerial photographs)

☐ Provincially Significant Wetland Name: _____

☐ Wetlands ☐ Unevaluated Wetlands*

☐ Area of Natural & Scientific Interest Name: _____

☐ Environmentally Significant Area Name: _____

☐ Potential ESAs ☐ Upland Corridors

☐ Significant Woodlands ☐ Woodlands

☐ Significant Valleylands ☐ Valleylands

☐ Unevaluated Vegetation Patches ☐ Potential Naturalization Areas

Patch No. _____

** ELC (air photo interpretation and / or previous studies) may identify potential wetlands or other potential features not captured on Map 5.*

Map 6 Hazards and Natural Resources:

☐ Maximum Hazard Line ☐ Conservation Authority Regulation Limit (and text based regulatory limit) – Project falls under *Conservation Authority Act* Section 28

Required Field Investigations:

Aquatic:

☐ Aquatic Habitat Assessment: _____

☐ Fish Community (Collection): _____

☐ Spawning Surveys: _____

☐ Benthic Invertebrate Survey: _____

☐ Mussels: _____

☐ Other: _____

Wetlands:

☐ Wetland Delineation: _____

☐ Wetland Evaluation (OWES): _____

☐ Other: _____

Terrestrial (Wetland, Upland and Lowland):

☐ Vegetation Communities (ELC): _____

☐ Botanical Inventories ☐ Winter ☐ Spring ☐ Summer ☐ Fall

☐ Breeding Bird Surveys (type & frequency): _____

☐ Raptor Surveys: _____ ☐ Shoreline Birds: _____

☐ Crepuscular Surveys: _____ ☐ Grassland Surveys: _____

☐ Amphibian Surveys (type & frequency): _____

☐ Reptile Surveys:

- ☐ Turtle (type & frequency): _____
- ☐ Snake (type & frequency): _____
- ☐ Other (type & frequency): _____

☐ Bat Habitat, Cavity & Acoustic Surveys:_____

☐ Mammal Surveys: _____

- ☐ Winter Wildlife Surveys: _____

☐ Butterflies (Lepidoptera): _____

☐ Dragonflies / Damselflies (Odonata): _____

☐ Species at Risk Specific Surveys: _____

☐ Species of Conservation Concern Surveys: _____

☐ Significant Wildlife Habitat Surveys: _____

☐ Other field investigations: _____

Supporting Concurrent Studies/Investigations:

☐ Hydrogeological/Groundwater: _____

☐ Surface Water/Hydrology: _____

☐ Water Balance: _____

☐ Fluvial Geomorphological: _____

☐ Geotechnical: _____

☐ Tree Inventory: _____

☐ Other: _____

Evaluation of Significance:

Federal:

☐ Fish Habitat ☐ Other Federal: _____

☐ Species at Risk (*SARA*)

Provincial:

☐ Provincially Significant Wetlands
☐ Significant Valleylands
☐ Areas of Natural & Scientific Interest
☐ Water Resource Systems
☐ Species at Risk (*ESA*): _____
☐ Significant Woodlands
☐ Significant Wildlife Habitat Ecoregion 7E
☐ Fish Habitat

Municipal/London:

☐ Environmentally Significant Areas (ESAs), Potential ESAs
☐ Significant Woodlands, Woodlands
☐ Significant Valleylands, Valleylands
☐ Wetlands, Unevaluated Wetlands
☐ Significant Wildlife Habitat
☐ Unevaluated Vegetation Patches
☐ Other Vegetation Patches >0.5 ha
☐ Potential Naturalization Area
☐ Other: _____

Impact Assessment:

☐ Impact Assessment Required
☐ Net Effects Table Required

Environmental Management Recommendations:

☐ Environmental Management Plan: _____
☐ Specifications & Conditions of Approval: _____
☐ Other: _____

Environmental Monitoring:

☐ Baseline Monitoring: _____
☐ Construction Monitoring: _____
☐ Post-Construction Monitoring: _____

Additional Requirements and Notes:

Appendix IV
Vascular Flora Species Reported from the Study Area

Plant Species Reported from the Study Area - Western Road Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Middlesex	Medway Creek Community-based Enhancement Strategy	NHIC Data*	NRSI Observed
		NDMNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Oldham 2017	UTRCA 2009	NDMNRF 2022	NRSI Results From 2022
Gymnosperms	**Conifers**									
Cupressaceae	**Cypress Family**									
Thuja occidentalis	Eastern White Cedar	S5					X	X		
Pinaceae	**Pine Family**									
Pinus strobus	Eastern White Pine	S5					X	X		
Tsuga canadensis	Eastern Hemlock	S5					X	X		
Dicotyledons	**Dicots**									
Aceraceae	**Maple Family**									
Acer negundo	Manitoba Maple	S5					C	X		
Acer platanoides	Norway Maple	SE5					IU			X
Acer pseudoplatanus	Sycamore Maple	SE1						X		
Acer saccharum	Sugar Maple	S5					C	X		X
Cornaceae	**Dogwood Family**									
Cornus alternifolia	Alternate-leaved Dogwood	S5					X			X
Fagaceae	**Beech Family**									
Fagus grandifolia	American Beech	S4					C	X		X
Quercus macrocarpa	Bur Oak	S5					C			X
Quercus rubra	Northern Red Oak	S5					C			X
Juglandaceae	**Walnut Family**									
Carya cordiformis	Bitternut Hickory	S5					X			X
Juglans nigra	Black Walnut	S4?					X			X
Moraceae	**Mulberry Family**									
Morus alba	White Mulberry	SE5					IX			X
Oleaceae	**Olive Family**									
Ligustrum ovalifolium	California Privet	SE1								X
Rhamnaceae	**Buckthorn Family**									
Rhamnus cathartica	Common Buckthorn	SE5					IC			X
Rosaceae	**Rose Family**									
Physocarpus opulifolius	Eastern Ninebark	S5					X	X		
Prunus serotina	Black Cherry	S5					C	X		X
Prunus virginiana	Choke Cherry	S5					C			X
Salicaceae	**Willow Family**									
Populus deltoides	Eastern Cottonwood	S5					X			X
Populus tremuloides	Trembling Aspen	S5					X			X
Simaroubaceae	**Ailanthus Family**									
Ailanthus altissima	Tree-of-heaven	SE5					IR			X
Tiliaceae	**Linden Family**									
Tilia americana	American Basswood	S5					C			X
Ulmaceae	**Elm Family**									
Celtis occidentalis	Common Hackberry	S4					X			X
Monocotyledons	**Monocots**									
Araceae	**Arum Family**									
Arisaema dracontium	Green Dragon	S3		SC	SC	Schedule 3	U		X	
Liliaceae	**Lily Family**									
Erythronium americanum	Yellow Trout-lily	S5					X	X		
Maianthemum racemosum	Large False Solomon's Seal	S5					X	X		
Polygonatum biflorum	Giant Solomon's Seal	S4						X		

Trillium grandiflorum	White Trillium	S5					X	X		
TOTAL								**13**	**1**	**18**

*NHIC Atlas Square(s): 17MH76

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Appendix V
Bird Species Reported from the Study Area

Bird Species Reported from the Study Area - Western Rd Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence	Other Observations
		NDMNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	BSC et al. 2006	NDMNRF 2022	NRSI Results from 2022	
Anatidae	**Ducks, Geese & Swans**									
Aix sponsa	Wood Duck	S5B, S3N					CO			
Anas platyrhynchos	Mallard	S5					CO			
Branta canadensis	Canada Goose	S5					CO		**OB**	OB
Odontophoridae	**New World Quails**									
Colinus virginianus	Northern Bobwhite	S1?B	END	E	E	Schedule 1	PR			
Phasianidae	**Partridges, Grouse & Turkeys**									
Bonasa umbellus	Ruffed Grouse	S5					PO			
Meleagris gallopavo	Wild Turkey	S5					CO			
Phasianus colchicus	Ring-necked Pheasant	SNA					PO			
Columbidae	**Pigeons & Doves**									
Columba livia	Rock Pigeon	SNA					CO			
Zenaida macroura	Mourning Dove	S5					CO			
Cuculiformes	**Cuckoos & Anis**									
Coccyzus americanus	Yellow-billed Cuckoo	S4B					PO			
Coccyzus erythropthalmus	Black-billed Cuckoo	S4S5B					CO			
Caprimulgidae	**Goatsuckers**									
Chordeiles minor	Common Nighthawk	S4B	SC	SC	T	Schedule 1	PR			
Apodidae	**Swifts**									
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	CO	X		
Trochilidae	**Hummingbirds**									
Archilochus colubris	Ruby-throated Hummingbird	S5B					PR			
Rallidae	**Rails, Gallinules & Coots**									
Porzana carolina	Sora	S5B					PR			
Rallus limicola	Virginia Rail	S4S5B					PR			
Charadriidae	**Plovers & Lapwings**									
Charadrius vociferus	Killdeer	S4B					CO		**OB**	OB
Scolopacidae	**Sandpipers & Allies**									
Actitis macularia	Spotted Sandpiper	S5B					PR			
Scolopax minor	American Woodcock	S4B					CO			
Laridae	**Gulls, Terns & Skimmers**									
Chlidonias niger	Black Tern	S3B, S4M	SC	NAR	NS	No schedule	PO			
Ardeidae	**Herons & Bitterns**									
Ardea herodias	Great Blue Heron	S4					PO			
Botaurus lentiginosus	American Bittern	S5B					PR			
Butorides virescens	Green Heron	S4B					PR			
Cathartidae	**Vultures**									
Cathartes aura	Turkey Vulture	S5B, S3N					PR			
Pandionidae	**Osprey**									
Pandion haliaetus	Osprey	S5B							**OB**	OB
Accipitridae	**Hawks, Kites, Eagles & Allies**									
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	CO			
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	CO		**OB**	OB
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	CO		**OB**	OB
Circus hudsonius	Northern Harrier	S5B, S4N	NAR	NAR	NS	No schedule	CO			
Strigidae	**Typical Owls**									
Asio otus	Long-eared Owl	S4					PO			

Bubo virginianus	Great Horned Owl	S4					CO			
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	PR			
Alcedinidae	**Kingfishers**									
Megaceryle alcyon	Belted Kingfisher	S5B, S4N					CO			
Picidae	**Woodpeckers**									
Colaptes auratus	Northern Flicker	S5					CO			
Dryobates pubescens	Downy Woodpecker	S5					CO		**OB**	OB
Dryobates villosus	Hairy Woodpecker	S5					CO			
Melanerpes carolinus	Red-bellied Woodpecker	S5					CO			
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B, S3N					CO			
Falconidae	**Caracaras & Falcons**									
Falco sparverius	American Kestrel	S4					CO			
Tyrannidae	**Tyrant Flycatchers**									
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	PR			
Empidonax minimus	Least Flycatcher	S5B					PO			
Empidonax traillii	Willow Flycatcher	S4B					CO			
Myiarchus crinitus	Great Crested Flycatcher	S5B					PR			
Sayornis phoebe	Eastern Phoebe	S5B					CO			
Tyrannus tyrannus	Eastern Kingbird	S4B					CO			
Vireonidae	**Vireos**									
Vireo gilvus	Warbling Vireo	S5B					PR			
Vireo olivaceus	Red-eyed Vireo	S5B					CO			
Corvidae	**Crows & Jays**									
Corvus brachyrhynchos	American Crow	S5					CO		**OB**	OB
Cyanocitta cristata	Blue Jay	S5					CO		**OB**	OB
Alaudidae	**Larks**									
Eremophila alpestris	Horned Lark	S4					PR			
Hirundinidae	**Swallows**									
Hirundo rustica	Barn Swallow	S4B	THR	SC	T	Schedule 1	CO	X		
Petrochelidon pyrrhonota	Cliff Swallow	S4S5B					CO			
Progne subis	Purple Martin	S3B					CO			
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					CO			
Tachycineta bicolor	Tree Swallow	S4S5B					CO			
Paridae	**Chickadees & Titmice**									
Poecile atricapillus	Black-capped Chickadee	S5					CO			
Sittidae	**Nuthatches**									
Sitta canadensis	Red-breasted Nuthatch	S5					PR			
Sitta carolinensis	White-breasted Nuthatch	S5					CO			
Certhiidae	**Creepers**									
Certhia americana	Brown Creeper	S5					CO			
Troglodytidae	**Wrens**									
Cistothorus palustris	Marsh Wren	S4B, S3N					CO			
Cistothorus platensis	Sedge Wren	S4B	NAR	NAR	NS	No schedule	PR			
Thryothorus ludovicianus	Carolina Wren	S4					CO			
Troglodytes aedon	House Wren	S5B					CO			
Troglodytes hiemalis	Winter Wren	S5B, S4N					PO			
Polioptilidae	**Gnatcatchers**									
Polioptila caerulea	Blue-gray Gnatcatcher	S4B					PO			
Turdidae	**Thrushes**									
Catharus fuscescens	Veery	S5B					PO			
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	PR	X		
Sialia sialis	Eastern Bluebird	S5B, S4N	NAR	NAR	NS	No schedule	CO			
Turdus migratorius	American Robin	S5					CO		**OB**	OB
Mimidae	**Mockingbirds, Thrashers & Allies**									
Dumetella carolinensis	Gray Catbird	S5B, S3N					CO			

Toxostoma rufum	Brown Thrasher	S4B					PR			
Sturnidae	**Starlings**									
Sturnus vulgaris	European Starling	SNA					CO		**OB**	OB
Bombycillidae	**Waxwings**									
Bombycilla cedrorum	Cedar Waxwing	S5					CO			
Passeridae	**Old World Sparrows**									
Passer domesticus	House Sparrow	SNA					CO			
Fringillidae	**Finches & Allies**									
Haemorhous mexicanus	House Finch	SNA					CO		**OB**	OB
Spinus tristis	American Goldfinch	S5					CO		**OB**	OB
Emberizidae	**New World Sparrows & Allies**									
Melospiza georgiana	Swamp Sparrow	S5B, S4N					CO			
Melospiza melodia	Song Sparrow	S5					CO		**OB**	OB
Passerculus sandwichensis	Savannah Sparrow	S5B, S3N					CO			
Pipilo erythrophthalmus	Eastern Towhee	S4B, S3N					PR			
Pooecetes gramineus	Vesper Sparrow	S4B					PR			
Spizella passerina	Chipping Sparrow	S5B, S3N					CO			
Spizella pusilla	Field Sparrow	S4B, S3N					CO			
Zonotrichia albicollis	White-throated Sparrow	S5					PO			
Icteridae	**Troupials & Allies**									
Agelaius phoeniceus	Red-winged Blackbird	S5					CO			
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	CO			
Icterus galbula	Baltimore Oriole	S4B					CO			
Icterus spurius	Orchard Oriole	S4B					CO			
Molothrus ater	Brown-headed Cowbird	S5					CO			
Quiscalus quiscula	Common Grackle	S5					CO		**OB**	OB
Sturnella magna	Eastern Meadowlark	S4B, S3N	THR	T	T	Schedule 1	PR			
Parulidae	**Wood Warblers**									
Geothlypis trichas	Common Yellowthroat	S5B, S3N					PR			
Setophaga fusca	Blackburnian Warbler	S5B					PR			
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					PR			
Setophaga petechia	Yellow Warbler	S5B					CO			
Setophaga ruticilla	American Redstart	S5B					PR			
Vermivora cyanoptera	Blue-winged Warbler	S4B					PO			
Cardinalidae	**Cardinals, Grosbeaks & Allies**									
Cardinalis cardinalis	Northern Cardinal	S5					CO		**OB**	OB
Passerina cyanea	Indigo Bunting	S5B					CO			
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B					CO			
Piranga olivacea	Scarlet Tanager	S5B					CO			
Total							**100**	**3**	**15**	**15**

*OBBA Atlas Square: 17MH76
**NHIC Atlas Square: 17MH76

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Appendix VI
Herpetofauna Species Reported from the Study Area

Reptile and Amphibian Species Reported from the Study Area - Western Rd Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Medway Creek Community-based Enhancement Strategy	ORAA*	NHIC Data**
		NDMNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	UTRCA 2009	Ontario Nature 2019	NDMNRF 2022
Turtles									
Apalone spinifera	Eastern Spiny Softshell	S2	END	E	E	Schedule 1			X
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1		X	X
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1		X	X
Emydoidea blandingii	Blanding's Turtle (Great Lakes / St. Lawre	S3	THR	E	E	Schedule 1	X		
Graptemys geographica	Northern Map Turtle	S3	SC	SC	SC	Schedule 1		X	X
Snakes									
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	T	Schedule 1	X	X	
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1		X	
Regina septemvittata	Queensnake	S2	END	E	E	Schedule 1	X	X	X
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule		X	
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5						X	
Salamanders									
Ambystoma laterale	Blue-spotted Salamander	S4						X	
Necturus maculosus	Mudpuppy	S4	NAR	NAR	NS	No schedule		X	
Notophthalmus viridescens viridescens	Red-spotted Newt	S5						X	
Plethodon cinereus	Eastern Red-backed Salamander	S5						X	
Frogs and Toads									
Anaxyrus americanus	American Toad	S5						X	
Hyla versicolor	Gray Treefrog	S5						X	
Pseudacris crucifer	Spring Peeper	S5						X	
Lithobates catesbeianus	American Bullfrog	S4						X	
Lithobates clamitans	Green Frog	S5						X	
Lithobates palustris	Pickerel Frog	S4	NAR	NAR	NS	No schedule		X	
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule		X	
Lithobates sylvaticus	Wood Frog	S5						X	
Total							**3**	**20**	**5**

*ORAA Atlas Square: 17MH76
**NHIC Atlas Square: 17MH76

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Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2021. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17.
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Government of Canada. 2021. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2021-12-01.
Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Appendix VII
Mammal Species Reported from the Study Area

Mammal Species Reported from the Study Area - Western Rd Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Medway Creek Community-based Enhancement Strategy	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
		NDMNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	UTRCA 2009	Dobbyn 1994	NDMNRF 2022	NRSI Results from 2022
Didelphimorphia	**Opossums**									
Didelphis virginiana	Virginia Opossum	S4						X		
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**									
Blarina brevicauda	Northern Short-tailed Shrew	S5						X		
Chiroptera	**Bats**									
Eptesicus fuscus	Big Brown Bat	S4						X		
Lasiurus cinereus	Hoary Bat	S4						X		
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1		X		
Lagomorpha	**Rabbits and Hares**									
Lepus europaeus	European Hare	SNA						X		
Sylvilagus floridanus	Eastern Cottontail	S5						X		
Rodentia	**Rodents**									
Castor canadensis	Beaver	S5						X		
Marmota monax	Woodchuck	S5						X		
Microtus pennsylvanicus	Meadow Vole	S5						X		
Ondatra zibethicus	Muskrat	S5						X		
Peromyscus leucopus	White-footed Mouse	S5						X		
Peromyscus maniculatus	Deer Mouse	S5						X		
Rattus norvegicus	Norway Rat	SNA						X		
Sciurus carolinensis	Eastern Gray Squirrel	S5						X		X
Tamias striatus	Eastern Chipmunk	S5						X		
Tamiasciurus hudsonicus	Red Squirrel	S5						X		
Canidae	**Canines**									
Vulpes vulpes	Red Fox	S5						X		
Mephitidae	**Skunks and Stink Badgers**									
Mephitis mephitis	Striped Skunk	S5						X		
Mustelidae	**Weasels and Allies**									
Neovison vison	American Mink	S4						X		
Procyonidae	**Raccoons and Allies**									
Procyon lotor	Northern Raccoon	S5						X		
Artiodactyla	**Deer and Bison**									
Odocoileus virginianus	White-tailed Deer	S5						X		
Total							**1**	**22**	**0**	**1**

*Mammal Atlas Square Numbers: MT76
**NHIC Atlas Squares: 17MH76

References

Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2021. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17.
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Appendix VIII
Lepidoptera Species Reported from the Study Area

Butterfly Species Reported from the Study Area - Western Rd Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**
		NDMNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Macnaughton et al. 2022	NDMNRF 2022
Hesperiidae	**Skippers**							
Anatrytone logan	Delaware Skipper	S4					X	
Ancyloxypha numitor	Least Skipper	S5					X	
Epargyreus clarus	Silver-spotted Skipper	S4					X	
Erynnis baptisiae	Wild Indigo Duskywing	S4					X	
Erynnis brizo	Sleepy Duskywing	S1					X	
Euphyes dion	Dion Skipper	S4					X	
Euphyes vestris	Dun Skipper	S5					X	
Pholisora catullus	Common Sootywing	S4					X	
Poanes hobomok	Hobomok Skipper	S5					X	
Poanes viator	Broad-winged Skipper	S4					X	
Polites mystic	Long Dash Skipper	S5					X	
Polites peckius	Peck's Skipper	S5					X	
Polites themistocles	Tawny-edged Skipper	S5					X	
Pompeius verna	Little Glassywing	S4					X	
Thymelicus lineola	European Skipper	SNA					X	
Wallengrenia egeremet	Northern Broken Dash	S5					X	
Papilionidae	**Swallowtails**							
Papilio cresphontes	Giant Swallowtail	S4					X	
Papilio glaucus	Eastern Tiger Swallowtail	S5					X	
Papilio polyxenes	Black Swallowtail	S5					X	
Pieridae	**Whites and Sulphurs**							
Colias eurytheme	Orange Sulphur	S5					X	
Colias philodice	Clouded Sulphur	S5					X	
Pieris oleracea	Mustard White	S4					X	
Pieris rapae	Cabbage White	SNA					X	
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**							
Celastrina neglecta	Summer Azure	S5					X	
Celastrina sp.	Azure species	SNA					X	
Cupido comyntas	Eastern Tailed Blue	S5					X	
Feniseca tarquinius	Harvester	S4					X	
Lycaena epixanthe	Bog Copper	S4S5					X	
Lycaena hyllus	Bronze Copper	S5					X	
Satyrium acadica	Acadian Hairstreak	S4					X	
Satyrium calanus	Banded Hairstreak	S4					X	
Satyrium caryaevorus	Hickory Hairstreak	S4					X	
Satyrium liparops	Striped Hairstreak	S5					X	
Nymphalidae	**Brush-footed Butterflies**							
Aglais milberti	Milbert's Tortoiseshell	S5					X	
Asterocampa celtis	Hackberry Emperor	S3					X	
Asterocampa clyton	Tawny Emperor	S3					X	
Cercyonis pegala	Common Wood-Nymph	S5					X	
Coenonympha tullia	Common Ringlet	S5					X	
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	X	
Euphydryas phaeton	Baltimore Checkerspot	S4					X	
Junonia coenia	Common Buckeye	SNA					X	
Lethe anthedon	Northern Pearly-Eye	S5					X	
Lethe appalachia	Appalachian Brown	S4					X	
Lethe eurydice	Eyed Brown	S5					X	
Libytheana carinenta	American Snout	SNA					X	
Limenitis archippus	Viceroy	S5					X	
Limenitis arthemis arthemis	White Admiral	S5					X	
Limenitis arthemis astyanax	Red-spotted Purple	S5					X	
Megisto cymela	Little Wood-Satyr	S5					X	
Nymphalis l-album	Compton Tortoiseshell	S5					X	
Phyciodes cocyta	Northern Crescent	S5					X	
Phyciodes tharos	Pearl Crescent	S4					X	
Polygonia comma	Eastern Comma	S5					X	
Polygonia interrogationis	Question Mark	S5					X	
Speyeria aphrodite	Aphrodite Fritillary	S5					X	
Speyeria cybele	Great Spangled Fritillary	S5					X	
Vanessa atalanta	Red Admiral	S5B					X	
Vanessa cardui	Painted Lady	S5B					X	
Vanessa virginiensis	American Lady	S5					X	
Total							**59**	**0**

*TEA Atlas Square: 17MH76
**NHIC Atlas Square: 17MH76

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Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2021. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2021-07-29. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Appendix IX
Odonata Species Reported from the Study Area

Odonate Species Reported from the Study Area - Western Rd Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Odonate Atlas*	NHIC Data**
		NDMNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	OOAD 2022	NDMNRF 2022
Calopterygidae	**Broadwinged Damselflies**							
Calopteryx maculata	Ebony Jewelwing	S5					X	
Hetaerina americana	American Rubyspot	S4					X	
Lestidae	**Spreadwings**							
Lestes disjunctus	Northern Spreadwing	S5					X	
Lestes rectangularis	Slender Spreadwing	S5					X	
Coenagrionidae	**Narrow-winged Damselflies**							
Argia fumipennis violacea	Violet Dancer	S5					X	
Argia moesta	Powdered Dancer	S5					X	
Enallagma exsulans	Stream Bluet	S5					X	
Ischnura posita	Fragile Forktail	S4					X	
Ischnura verticalis	Eastern Forktail	S5					X	
Libellulidae	**Skimmers**							
Libellula pulchella	Twelve-spotted Skimmer	S5					X	
Sympetrum semicinctum	Band-winged Meadowhawk	S4					X	
Total							**11**	**0**

**Odonate Atlas Square Numbers: 17MH76*
***NHIC Atlas Squares: 17MH76*

References

Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2021. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17.
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Species list from atlas square 17MH76 queried on February 28, 2022.
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Appendix X
Fish Species Reported from the Study Area

Fish Species Reported from the Study Area - Western Rd Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Medway Creek Community-based Enhancement Strategy	Fisheries and Oceans SAR Data	NHIC Data*
		NDMNRF 2021	MECP 2022	ernment of Canada 2	ernment of Canada 2	ernment of Canada 2	UTRCA 2009	DFO 2021	NDMNRF 2022
Cyprinidae	**Carps**								
Cyprinus carpio	Common Carp	SNA					X		
Leuciscidae	**Minnows**								
Campostoma anomalum	Central Stoneroller	S4	NAR	NAR	NS	No schedule	X		
Chrosomus eos	Northern Redbelly Dace	S5					X		
Cyprinella spiloptera	Spotfin Shiner	S4					X		
Hybognathus hankinsoni	Brassy Minnow	S5					X		
Luxilus chrysocephalus	Striped Shiner	S4	NAR	NAR	NS	No schedule	X		
Luxilus cornutus	Common Shiner	S5					X		
Lythrurus umbratilis	Redfin Shiner	S4	NAR	NAR	NS	No schedule	X		
Nocomis biguttatus	Hornyhead Chub	S4	NAR	NAR	NS	No schedule	X		
Nocomis micropogon	River Chub	S4	NAR	NAR	NS	No schedule	X		
Notropis photogenis	Silver Shiner	S2S3	THR	T	T	Schedule 1	X	X	X
Notropis rubellus	Rosyface Shiner	S4	NAR	NAR	NS	No schedule	X		
Notropis volucellus	Mimic Shiner	S5					X		
Pimephales notatus	Bluntnose Minnow	S5	NAR	NAR	NS	No schedule	X		
Pimephales promelas	Fathead Minnow	S5					X		
Rhinichthys atratulus	Blacknose Dace	S5					X		
Rhinichthys cataractae	Longnose Dace	S5					X		
Semotilus atromaculatus	Creek Chub	S5					X		
Catostomidae	**Suckers**								
Carpiodes cyprinus	Quillback	S4					X		
Catostomus commersonii	White Sucker	S5					X		
Hypentelium nigricans	Northern Hog Sucker	S4					X		
Moxostoma anisurum	Silver Redhorse	S4					X		
Moxostoma duquesnei	Black Redhorse	S2	THR	T	T	Schedule 1	X	X	
Moxostoma erythrurum	Golden Redhorse	S4	NAR	NAR	NS	No schedule	X		
Moxostoma macrolepidotum	Shorthead Redhorse	S5					X		
Ictaluridae	**North American Catfishes**								
Ameiurus melas	Black Bullhead	S4					X		
Noturus flavus	Stonecat	S4					X		
Esocidae	**Pikes**								
Esox lucius	Northern Pike	S5					X		
Umbridae	**Mudminnows**								
Umbra limi	Central Mudminnow	S5					X		
Salmonidae	**Trouts and Salmons**								
Oncorhynchus mykiss	Rainbow Trout	SNA					X		
Gasterosteidae	**Sticklebacks**								
Culaea inconstans	Brook Stickleback	S5					X		
Centrarchidae	**Sunfishes and Basses**								
Ambloplites rupestris	Rock Bass	S5					X		
Lepomis cyanellus	Green Sunfish	S4	NAR	NAR	NS	No schedule	X		
Lepomis gibbosus	Pumpkinseed	S5					X		
Lepomis megalotis	Longear Sunfish	SNR					X		
Lepomis peltastes pop. 2	Northern Sunfish (Great Lakes - Upper St.	S3	SC	SC	SC	Schedule 1		X	
Micropterus dolomieu	Smallmouth Bass	S5					X		
Micropterus salmoides	Largemouth Bass	S5					X		
Pomoxis nigromaculatus	Black Crappie	S4					X		
Percidae	**Perches and Darters**								
Etheostoma blennioides	Greenside Darter	S4	NAR	NAR	SC	Schedule 3	X		
Etheostoma caeruleum	Rainbow Darter	S4					X		
Etheostoma flabellare	Fantail Darter	S4					X		
Etheostoma microperca	Least Darter	S4	NAR	NAR	NS	No schedule	X		
Etheostoma nigrum	Johnny Darter	S5					X		
Perca flavescens	Yellow Perch	S5					X		
Percina maculata	Blackside Darter	S4					X		
Total							**45**	**3**	**1**

*NHIC Atlas Square(s): 17MH76

References

Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2021. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17.
All Species List Updated: 2021-07-29. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Appendix XI
Mussel Species Reported from the Study Area

Mussel Species Reported from the Study Area - Western Rd Focused EIS (Project #2790)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA STATUS	SARA SCHEDULE	Medway Creek Community-based Enhancement Strategy	Fisheries and Oceans SAR Data	NHIC Data
		NDMNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	UTRCA 2009	DFO 2021	NDMNRF 2022
Unionida	**Native Freshwater Mussels**								
Ambleminae									
Elliptio dilatata	Spike	S5					X		
Fusconaia flava	Wabash Pigtoe	S2S3					X		
Anodontinae									
Alasmidonta marginata	Elktoe	S3					X		
Alasmidonta viridis	Slippershell Mussel	S3					X		
Anodontoides ferussacianus	Cylindrical Papershell	S4					X		
Lasmigona compressa	Creek Heelsplitter	S5					X		
Lasmigona costata	Fluted-shell	S5					X		
Pyganodon grandis	Giant Floater	S5					X		
Strophitus undulatus	Creeper	S5					X		
Lampsilinae									
Actinonaias ligamentina	Mucket	S4					X		
Lampsilis cardium	Plain Pocketbook	S4					X		
Lampsilis fasciola	Wavy-rayed Lampmussel	S2	THR	SC	SC	Schedule 1	X	X	X
Lampsilis siliquoidea	Fatmucket	S5					X		
Ptychobranchus fasciolaris	Kidneyshell	S1	END	E	E	Schedule 1	X		
Villosa iris	Rainbow	S1	SC	SC	SC	Schedule 1	X		
Total							**15**	**1**	**1**

*NHIC Atlas Squares: 17MH76

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