

TECHNICAL MEMORANDUM

DATE August 25, 2021

Project No. 20352122

TO Ms. Lorraine Roberts
SkyDev

FROM Danielle Radu, Heather Melcher

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**ADDENDUM TO THE ENVIRONMENTAL IMPACT STUDY
FULLER STREET AND BOUCHER STREET DEVELOPMENT, MEAFORD, ONTARIO**

1.0 INTRODUCTION AND CONTEXT

Golder Associates Ltd. (Golder) was retained by SkyDev to prepare a preliminary Environmental Impact Study (EIS) for the proposed development located at the Fuller Street and Boucher Street intersection, Meaford, Ontario (the site) for mixed use, including a hotel and multi-residential buildings (the Project). The preliminary EIS was completed in February 2021 and was based on a desktop review and site reconnaissance conducted in September 2020. This addendum report has been prepared to present the results of the 2021 field surveys at the site, and any associated changes to the conclusions of the EIS, if any. The study area within these reports includes the site as well as the 120 m surrounding area.

2.0 METHODS

Table 1 outlines the surveys that were completed in 2020 and during the 2021 field season, as recommended in the preliminary EIS. Methods employed during each survey type are provided below.

Table 1: Surveys Conducted on the Site in 2020 and 2021

Year	Date	Survey
2020	September 9	Ecological Land Classification (ELC) and Botanical Inventory; Wildlife and Species at Risk Habitat Assessment
2021	June 3	Breeding Bird Survey; Wildlife and Species at Risk Habitat Assessment; Confirmation of ELC and Botanical Inventory
	June 16	Breeding Bird Survey; Wildlife and Species at Risk Habitat Assessment; Aquatic Habitat Assessment

2.1 Ecological Land Classification and Botanical Inventory

Plant communities in the study area were first delineated at a desktop level using aerial imagery, then further assessed, and refined on the site during field surveys, both in 2020 and in 2021. Plant communities were classified using the Ecological Land Classification (ELC) system for Southern Ontario (Lee et al. 1998). Plant community structure and other habitat features were also noted during these surveys.

The botanical inventory included area searches in all naturally-occurring habitats on the site. Observations of plant species during all other field surveys were also recorded. A running list of all plant species identified on the site during the field surveys was compiled. The searches were conducted by systematically walking through all habitats, in a meandering fashion, generally paralleling the principal (long) axis of a natural area, where feasible, and examining the full width of the area.

2.2 Wildlife and Species at Risk Habitat Assessment

General wildlife surveys included track and sign surveys, area searches, and incidental observations, concurrent with other field surveys. The full range of habitats were searched, with special attention paid to edge habitats and other areas where mammals might be active. Areas of exposed substrate such as sand or mud were located and examined for any visible tracks. When encountered, tracks and other signs (e.g., tracks, scats, hair, tree scrapes) were identified to a species, if possible, and recorded. All suitable habitats for reptiles were searched (e.g., flipping logs and other types of cover objects, observations in piles of rocks) where access was available. Observations of wildlife species or signs were recorded during all field surveys.

Searches were conducted during field surveys for suitable habitats and signs of all SAR identified through the desktop screening in the preliminary EIS. If the potential for the species to occur in the study area was moderate or high, the screening was refined based on field surveys and/or species-specific surveys. Any habitat identified during field surveys with potential to provide suitable conditions for additional SAR not already identified through the desktop screening was also assessed and documented.

2.3 Breeding Bird Surveys

Two diurnal breeding bird point count surveys were conducted at two stations on the site (Figure 1). Surveys followed protocols from the Canadian Breeding Bird Survey (Downes and Collins 2003), and the Breeding Bird Atlas of Ontario (OBBA; Cadman et al. 2007). Point count stations were established in representative habitats on the site and were spaced a minimum of 250 m apart. Surveys were conducted between 30 minutes before sunrise and 10:00 am to encompass the period of maximum bird song.

Each station consisted of a circle with a 100 m radius from the centre point (where the observer stands), and each point count was 10 minutes in duration, and was separated into survey windows of 0-3, 3-5, and 5-10 minutes. All birds seen or heard were noted on pre-printed datasheets and observations were made regarding sex, age, and notable behaviour, when possible. Birds heard or seen outside of the 100 m radius were also recorded.

Birds were also searched for and noted while walking in between stations, and during other surveys on the site.

2.4 Aquatic Habitat Assessment

A qualitative fish habitat assessment was conducted along the reach of Meaford Creek on the site and off-site in the study area where access was possible. The survey was completed by visually observing the reach of the

creek and documenting . parameters such as bankfull and wetted width and water depth cover features, instream and riparian vegetation and hydrologic connections to other surface water features.

3.0 RESULTS

3.1 Vegetation

A total of 37 vascular plant taxa were identified on the site during field surveys. Of these, 27% are native species, and 62% are alien species. The remaining 11% were unable to be identified to the species level due to high levels of hybridization or plant condition (e.g., browsing by animals). A list of vascular plants observed on the site is provided in Attachment A. No plants observed on the site are considered SAR or regionally / locally rare.

3.2 Breeding Birds

A total of 38 birds were observed in the study area during the breeding bird or other field surveys. Of these, one species was confirmed as breeding, eight species were assessed as probable breeding, and 21 species were assessed as possible breeding based on the breeding evidence outlined in the OBBA (Cadman et al. 2007) (Attachment B). Eight bird species were assessed not to be breeding in the study area because they were recorded as fly-overs (i.e., individuals did not demonstrate use of habitat in the study area). A list of birds observed in the study area is provided in Attachment B.

Two bird species designated threatened under the ESA were observed flying over the site (i.e., no breeding evidence) including barn swallow (*Hirundo rustica*) and chimney swift (*Chaetura pelagica*). No potential nesting habitat for these two species were observed on the site. A culvert associated with Meaford Creek outside of the site in the southeastern portion of the study area was surveyed for evidence of barn swallow. No barn swallow nests or breeding evidence were observed in the culvert during field surveys. Residential chimneys outside of the site, in the western and southern portions of the study area, may provide suitable nesting and roosting habitat for chimney swift. Because potential habitat outside of the site will not be altered, chimney swift is not expected to be impacted by the proposed Project. Multiple individuals were observed foraging over the site during breeding bird surveys. As discussed in the preliminary EIS, foraging habitat is not a category of chimney swift habitat protected under the ESA.

One bird species designated special concern under the ESA was observed outside of the site in the southeastern portion of the study area, within trees associated with Meaford Creek: eastern wood-pewee (*Contopus virens*). One eastern wood-pewee individual was observed singing during the first round of breeding bird surveys (June 3), within the migration period for this species (approximately 10 May to 10 June [COSEWIC 2012]). This species was not observed during the second round of surveys on June 16. The patches of forest on the site and in the study area are likely too small to be preferred breeding habitat by eastern wood-pewee. Because of these reasons, the observed individual was determined to be a migrant using trees outside of the site in the study area as a temporary stopover site before continuing on to suitable breeding habitat elsewhere.

3.3 Other Wildlife and Species at Risk

Four additional wildlife species, beyond what was documented in the preliminary EIS, were observed on the site during the 2021 surveys. These species included two arthropods, cabbage white (*Pieris rapae*) and eastern ringlet

(*Coenonympha tullia*), and two mammals, eastern cottontail (*Sylvilagus floridanus*) and eastern gray squirrel (*Sciurus carolinensis*) (Attachment B). None of these species are considered SAR or regionally / locally rare.

Based on the results of the 2021 field surveys, the number of SAR assessed to have moderate or high potential to occur in the study area was reduced from ten to six, based on the presence of potential suitable habitat (Appendix A): monarch (*Danaus plexippus*), yellow-banded bumble bee (*Bombus terricola*), chimney swift (*Chaetura pelagica*), little brown myotis (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), tri-colored bat (*Perimyotis subflavus*) (Attachment C).

Based on the results of the 2020 and the 2021 field surveys, the cultural meadow (CUM) on the site (Figure 1) may provide suitable breeding and foraging habitat for monarch and yellow-banded bumblebee. There was no suitable bat maternity roosting habitat for little brown myotis, northern myotis, and tri-colored bat observed in the deciduous forest (FOD) on the site or in the poplar deciduous forest (FOD8-1) immediately adjacent to the site along the Georgian Bay shoreline (Figure 1). Outside of the site, the small deciduous forests (FOD, FOD7) in the western and southern portions of the study area (Figure 1) may provide suitable maternity roosting habitat for tree-roosting SAR bats.

Based on the results of the breeding bird surveys (Section 3.2), barn swallow and eastern wood-pewee were re-assessed to have a low potential to occur in the study area due to a lack of breeding evidence. In addition, based on the results of the aquatic habitat assessment in Meaford Creek (Section 3.4), snapping turtle (*Chelydra serpentina*) and silver lamprey (*Ichthyomyzon unicuspis*) were re-assessed to have low potential to occur due to the lack of in-stream aquatic vegetation and presence of silty substrate, respectively.

None of the other wildlife species identified in the preliminary EIS as having ranges which overlap the study area were identified during the 2021 field surveys (Attachment C).

3.4 Aquatic Habitat

The reach of Meaford Creek that flows through the southeast corner of the site was assessed to provide direct fish habitat. The creek was observed to have a bankfull width ranging between 6 - 8 m, and wetted width ranging between 3 - 4 m with areas of flat and riffle flow types. The substrate consisted of silt with isolated patches of cobble. There was very little instream cover in the creek, but dense overhead cover by deciduous trees and shrubs shaded the creek along most of the reach. Immediately south (i.e., upstream) of the site, the creek flows through a large cement box culvert beneath a gravel road, outletting to Georgian Bay approximately 20 m north of the culvert. Between the culvert and Georgian Bay, the banks of the creek were lined with boulders and/or cemented walls, with a water depth of approximately 50 cm in depth. In this area, water flowed in from both upstream and downstream (i.e., wave action from the lake). Upstream of the culvert, concrete blocks lined the channel for approximately 15 m, and water gently flowed downstream at depths that ranged between 5 – 20 cm. No fish were observed during field surveys. Based on the direct connection of the creek to Georgian Bay, the creek was assessed to have potential to support small and medium-bodied fish.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the 2021 field surveys, no additional mitigation measures beyond what is recommended in the preliminary EIS are warranted. The potential for four SAR to occur on the site and/or off-site in the study area was reduced from moderate to low potential due to a lack of suitable habitat and/or a lack of breeding evidence

including barn swallow, eastern wood-pewee, snapping turtle, and silvery lamprey. All conclusions and recommendations made in the preliminary EIS have been supported by the findings of the 2021 field surveys.

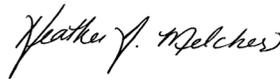
Sincerely,

Golder Associates Ltd.



Danielle Radu, MSc
Ecologist

DR/HM/mp/ff



Heather Melcher, MSc
Principal, Senior Ecologist

Attachments: Figure 1: ELC and Natural Heritage Constraints
Attachment A – Vegetation List
Attachment B – Wildlife List
Attachment C – Species at Risk Screening

[https://golderassociates.sharepoint.com/sites/132595/project files/6 deliverables/phase 3100 - eis/final/final eis addendum/20352122-tm-rev0-eis addendum-25aug2021.docx](https://golderassociates.sharepoint.com/sites/132595/project%20files/6%20deliverables/phase%203100%20-%20eis/final/final%20eis%20addendum/20352122-tm-rev0-eis%20addendum-25aug2021.docx)

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FIGURE

PATH: S:\Clients\SkyDev\Boucher_Street_E_Meaford_ON\09_PRCO\03022\00_PRCO\03022_Natural_Environment_Doc_Digital\20230816_122_0002_CS\0001.mxd, CREATED ON: 2023-08-16 AT: 12:40:12 PM



LEGEND

- BREEDING BIRD SURVEY STATION
- WATERCOURSE
- STUDY AREA
- ELC ZONE
- SITE

ELC Code	ELC Community
FOD8-1	Fresh-Moist Poplar Deciduous Forest
FOD7	Fresh-Moist Lowland Deciduous Forest
FOD	Deciduous Forest
CUM	Cultural Meadow
RES	Residential
COM	Commerical
DIST	Disturbed
OA	Open Water



NOTE(S)
 1. ALL LOCATIONS ARE APPROXIMATE.

REFERENCE(S)
 BASE MAP: © OPENSTREETMAP (AND) CONTRIBUTORS, CC-BY-SA
 SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY
 PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
 SKYDEV

PROJECT
 226 BOUCHER STREET EAST, MEAFORD, ONTARIO:
 ENVIRONMENTAL IMPACT STUDY

TITLE
ELC AND NATURAL HERITAGE CONSTRAINTS

CONSULTANT	YYYY-MM-DD	2021-08-16
GOLDER	DESIGNED	ST
	PREPARED	ST
	REVIEWED	DR
	APPROVED	HM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

ATTACHMENT A

Vegetation List

Scientific Name	Common Name	Origin ^a	S Rank ^b	G Rank ^b	ESA ^c
Trees (4 taxa)					
Green Ash	<i>Fraxinus pennsylvanica</i>	N	S4	G5	—
Manitoba Maple	<i>Acer negundo</i>	(N)	S5	G5	—
Sycamore Maple	<i>Acer pseudoplatanus</i>	I	SNA	GNR	—
Tree-of-heaven	<i>Ailanthus altissima</i>	I	SNA	GNR	—
Small trees, shrubs and woody vines (6 taxa)					
Chokecherry	<i>Prunus virginiana</i>	N	S5	G5	—
Common Buckthorn	<i>Rhamnus cathartica</i>	I	SNA	GNR	—
Heart-leaved Willow	<i>Salix cordata</i>	N	S4	G4	—
Lilac	<i>Syringa vulgaris</i>	I	SNA	GNR	—
Red-osier Dogwood	<i>Cornus sericea</i>	N	S5	G5	—
Staghorn Sumac	<i>Rhus typhina</i>	N	S5	G5	—
Graminoids (3 taxa)					
Timothy	<i>Phleum pratense</i>	I	SNA	GNR	—
Common Reed	<i>Phragmites australis</i>	I	SU	G5	—
Grass spp.	—	—	—	—	—
Forbs (24 taxa)					
Alfalfa	<i>Medicago sativa</i>	I	SNA	GNR	—
Aster sp.	<i>Symphotrichum sp.</i>	—	—	—	—
Bird's-foot Trefoil	<i>Lotus corniculatus</i>	I	SNA	GNR	—
Bladder Campion	<i>Silene vulgaris</i>	I	SNA	GNR	—
Butter-and-eggs	<i>Linaria vulgaris</i>	I	SNA	GNR	—
Canada Goldenrod	<i>Solidago canadensis</i>	N	S5	G5T5	—
Chicory	<i>Cichorium intybus</i>	I	SNA	GNR	—
Common Dandelion	<i>Taraxacum officinale</i>	I	SNA	G5	—
Common Silverweed	<i>Potentilla anserina</i>	N	S5	G5	—
Bouncing-bet	<i>Saponaria officinalis</i>	I	SNA	GNR	—
Common Viper's Bugloss	<i>Echium vulgare</i>	I	SNA	GNR	—
Cow-vetch	<i>Vicia cracca</i>	I	SNA	GNR	—
Creeping Buttercup	<i>Ranunculus repens</i>	I	SNA	GNR	—
Curled dock	<i>Rumex crispus</i>	I	SNA	GNR	—
Grass-leaved Goldenrod	<i>Euthamia graminifolia</i>	N	S5	G5	—
Goldenrod sp.	<i>Solidago sp.</i>	—	—	—	—
Common Mullein	<i>Verbascum thapsus</i>	I	SNA	GNR	—
Common Ragweed	<i>Ambrosia artemisiifolia</i>	N	S5	G5	—
Red Clover	<i>Trifolium pratense</i>	I	SNA	GNR	—
Spotted Knapweed	<i>Centaurea stoebe</i>	I	SNA	GNR	—
Twisted Stalk	<i>Streptopus sp.</i>	—	—	—	—
White Sweet-clover	<i>Melilotus albus</i>	I	SNA	G5	—
Wild Carrot	<i>Daucus carota</i>	I	SNA	GNR	—
Wood Avens	<i>Geum urbanum</i>	I	SNA	G5	—

^a Origin: N = Native; (N) = Native but not in study area region; I = Introduced.

^b Ranks based upon determinations made by the Natural Heritage Information Centre (2017).

G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.

NA = Not applicable [used mainly for abundance of non-natives; NR = Not ranked [used mainly for non-natives];

Q = Taxonomic questions not fully resolved; T = sub-specific taxon (taxa) present in the province; U = Uncertain.

^c *Endangered Species Act (ESA)*, 2007 (O.Reg 242/08 last amended 29 June 2020 as O.Reg 328/20). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 1 Aug 2018 as O. Reg 404/18, s. 1.)

END= Endangered; SC = Special Concern; THR = Threatened.

ATTACHMENT B

Wildlife List

Common Name	Scientific Name	Breeding Evidence ^a	SRANK ^b	GRANK ^b	ESA ^c
Arthropods					
Cabbage White	<i>Pieris rapae</i>	—	SNA	G5	—
Eastern Ringlet	<i>Coenonympha tullia</i>	—	S5	G5	—
Monarch	<i>Danaus plexippus</i>	—	S2N,S4B	G4	SC
Birds					
American Crow	<i>Corvus brachyrhynchos</i>	H	S5B	G5	—
American Goldfinch	<i>Carduelis tristis</i>	P	S5B	G5	—
American Redstart	<i>Setophaga ruticilla</i>	S	S5B	G5	—
American Robin	<i>Turdus migratorius</i>	P	S5B	G5	—
Baltimore Oriole	<i>Icterus galbula</i>	S	S4B	G5	—
Barn Swallow	<i>Hirundo rustica</i>	FO	S4B	G5	THR
Belted Kingfisher	<i>Megaceryle alcyon</i>	H	S4B	G5	—
Black-capped Chickadee	<i>Poecile atricapilla</i>	S	S5	G5	—
Blue Jay	<i>Cyanocitta cristata</i>	H	S5	G5	—
Brown-headed Cowbird	<i>Molothrus ater</i>	P	S4B	G5	—
Cedar Waxwing	<i>Bombycilla cedrorum</i>	H	S5B	G5	—
Chimney Swift	<i>Chaetura pelagica</i>	FO	S3B	G4G5	THR
Chipping Sparrow	<i>Spizella passerina</i>	S	S5B	G5	—
Common Grackle	<i>Quiscalus quiscula</i>	H	S5B	G5	—
Common Merganser	<i>Mergus merganser</i>	FO	S5	G5	—
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	FO	S5B, S4N	G6	—
Downy Woodpecker	<i>Picoides pubescens</i>	H	S5	G5	—
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S	S4B	G5	—
Eastern Wood-pewee	<i>Contopus virens</i>	S	S4B	G5	SC
European Starling	<i>Sturnus vulgaris</i>	P	SNA	G5	—
Gray Catbird	<i>Dumetella carolinensis</i>	H	S4B	G5	—
Herring Gull	<i>Larus argentatus</i>	FO	S4B, S5N	G5	—
House Sparrow	<i>Passer domesticus</i>	P	SNA	G5	—
House Wren	<i>Troglodytes aedon</i>	S	S5B	G5	—
Killdeer	<i>Charadrius vociferus</i>	FL	S5B, S5N	G5	—
Mallard	<i>Anas platyrhynchos</i>	P	S5	G5	—
Mourning Dove	<i>Zenaida macroura</i>	S	S5	G5	—
Northern Cardinal	<i>Cardinalis cardinalis</i>	S	S5	G5	—
Northern Flicker	<i>Colaptes auratus</i>	H	S4B	G5	—
Purple Martin	<i>Progne subis</i>	FO	S3B	G5	—
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	P	S4	G5	—
Ring-billed Gull	<i>Larus delawarensis</i>	FO	S5B,S4N	G5	—
Song Sparrow	<i>Melospiza melodia</i>	P	S5B	G5	—
Tree Swallow	<i>Tachycineta bicolor</i>	H	S4S5B	G5	—
Turkey Vulture	<i>Cathartes aura</i>	FO	S5B	G5	—
Warbling Vireo	<i>Vireo gilvus</i>	S	S5B	G5	—
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	H	S4B	G5	—
Yellow Warbler	<i>Setophaga petechia</i>	S	S5B	G5	—

Common Name	Scientific Name	Breeding Evidence ^a	SRANK ^b	GRANK ^b	ESA ^c
Mammals					
Eastern Cottontail	<i>Sylvilagus floridanus</i>	—	S5	G5	—
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	—	S5	G5	—

^a Breeding evidence for birds based on determinations made by the Ontario Breeding Bird Atlas
 Confirmed breeding evidence: FL = Recently fledged young observed while still dependent upon adults
 Probable breeding evidence: P = Pair observed in suitable nesting habitat in nesting season
 Possible breeding evidence: S = Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season; H = Species observed in its breeding season in suitable nesting habitat
 Observed (No breeding evidence): FO = Flyover only

^b Ranks based upon determinations made by the Ontario Natural Heritage Information Centre
 G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.
 SNA = Not applicable for Ontario Ranking (e.g. Exotic species)

^c Ontario *Endangered Species Act (ESA)*, 2007 (O.Reg 242/08 last amended 29 June 2020 as O.Reg 328/20). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 11 Aug 2018 as O. Reg 404/18, s. 1.); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

Bolded species are designated under the ESA

ATTACHMENT C

Species at Risk Screening

Common Name	Scientific Name	Endangered Species Act ¹	Species at Risk Act (Sch 1) ²	COSEWIC ³	Provincial (SRank) ⁴	Habitat Requirements ⁵	Potential to Occur on Site or in the Study Area (Desktop)	Rationale for Potential to Occur on Site or in the Study Area (Desktop)
Monarch	<i>Danaus plexippus</i>	SC	SC	END	S2N, S4B	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there is milkweed (<i>Asclepias</i> spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	High	The cultural meadow on the site may provide suitable and foraging habitat. In addition, this species was observed on the site during the 2020 site reconnaissance.
Yellow-banded bumble bee	<i>Bombus terricola</i>	SC	SC	SC	S2	Yellow-banded bumblebee is a forage and habitat generalist, occupying open woodlands, meadows, grasslands, farmlands and urban parks, and taking nectar from various flowering plants (COSEWIC 2015). It is an early emerging species, making it likely an important pollinator of early blooming wild flowering plants (e.g., wild blueberry) and agricultural crops (e.g., apple). Nest sites are often in abandoned rodent burrows in old fields and queens overwinter by burrowing into loose soil or rotting trees (COSEWIC 2015).	Moderate	The cultural meadow on the site may provide suitable foraging habitat. In addition, the small forests on the site and throughout the study area may provide suitable overwintering habitat.
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC	—	NAR	S2N,S4B	In Ontario, bald eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies (Buehler 2000).	Low	Off-site, the forest in the northern portion of the study area adjacent to the Georgian Bay shoreline is unlikely to provide suitable nesting habitat due to the lack of mature trees.
Bank swallow	<i>Riparia riparia</i>	THR	THR	THR	S4B	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Low	There are no suitable banks on the site or within the study area.
Barn swallow	<i>Hirundo rustica</i>	THR	THR	THR	S4B	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 2019).	Low	There are no suitable structures for nesting on the site. Immediately adjacent to the site, no barn swallow nests were observed in the culvert in the southeastern portion of the study area.
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	THR	S4B	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	Low	There are no suitable grasslands on the site or within the study area.

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Canada warbler	<i>Cardellina canadensis</i>	SC	THR	THR	S4B	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	Low	There are no swamps or thickets on the site or within the study area.
Chimney swift	<i>Chaetura pelagica</i>	THR	THR	THR	S4B, S4N	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Moderate	Off-site, the chimneys on houses throughout the western and southern portions of the study area may provide suitable nesting and roosting habitat. Multiple individuals were observed foraging over the site during the first breeding bird survey.
Common nighthawk	<i>Chordeiles minor</i>	SC	THR	SC	S4B	In Ontario, these aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bogs, fens, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007)	Low	The site is unlikely to be large enough to provide suitable nesting habitat.
Eastern meadowlark	<i>Sturnella magna</i>	THR	THR	THR	S4B	In Ontario, eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2019). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	Low	There are no suitable grasslands on the site or within the study area.
Eastern whip-poor-will	<i>Antrostomus vociferus</i>	THR	THR	THR	S4B	In Ontario, whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha (COSEWIC 2009). No nest is constructed, and eggs are laid directly on the leaf litter (Mills 2007).	Low	There are no suitable semi-open forests on the site or within the study area.
Eastern wood-pewee	<i>Contopus virens</i>	SC	SC	SC	S4B	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	Low	Although one individual was observed off-site in trees along the Georgian Bay shoreline during one breeding bird survey, it was not observed in suitable breeding habitat and was determined to be a migrant. No eastern wood-pewee were observed during the second breeding bird survey.
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	SC	THR	END	S4B	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Frei et al. 2017).	Low	There are no forests with numerous snags on the site or within the study area.

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Wood thrush	<i>Hylocichla mustelina</i>	SC	THR	THR	S4B	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Low	The forests on the site and within the study area are likely too small to provide suitable nesting habitat.
Lake sturgeon - Great Lakes / Upper St. Lawrence population	<i>Acipenser fulvescens</i>	END	—	THR	S2	In Ontario, lake sturgeon, a large prehistoric freshwater fish, is found in all the Great Lakes and in all drainages of the Great Lakes and of Hudson Bay. This species typically inhabits highly productive shoal areas of large lakes and rivers. They are bottom dwellers and prefer depths between 5-10 m and mud or gravel substrates. Small sturgeons are often found on gravelly shoals near the mouths of rivers. They spawn in depths of 0.5 to 4.5 m in areas of swift water or rapids. Where suitable spawning rivers are not available, such as in the lower Great Lakes, they are known to spawn in wave action over rocky ledges or around rocky islands (Golder 2011).	Low	Meaford Creek is likely too small to provide suitable aquatic habitat for this species. In addition, this species is not currently known to exist in the vicinity of the site.
Silver lamprey - Great Lakes / Upper St. Lawrence population	<i>Ichthyomyzon unicuspis</i>	SC	SC	END	S3	In Ontario, silver lamprey is known to occur in the Great Lakes and its tributaries, St. Lawrence River, Lake Nipissing, Lake-of-the-Woods and its tributaries, and the Ottawa River. Silver lamprey is a parasitic freshwater species that undertake spawning migrations in rivers and streams. They are often confused with sea lamprey. Adults prefer the clear waters of large streams, rivers, and lakes. Adults migrate in flowing water with stony or gravelly bottom material for nesting. Larvae seek out slow flowing areas initially with thick organic layers where they will grow until moving out into predominantly sandy environments where they reside until they reach adulthood (COSEWIC 2012).	Low	Meaford Creek in the southeast corner of the site is likely too silt-dominated to provide suitable aquatic habitat.
Eastern small-footed myotis	<i>Myotis leibii</i>	END	—	—	S2S3	In Ontario, eastern small-footed myotis is not known to roost in trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles, but it occasionally inhabits buildings. Entrances of caves or abandoned mines where humidity is low, and temperatures are cool and sometimes subfreezing may be used as hibernacula (Humphrey 2017).	Low	No potentially suitable rock piles were observed on the site or within the study area.
Gray fox	<i>Urocyon cinereoargenteus</i>	THR	THR	THR	S1	While the Ontario range of this species extends across much of southern and southeastern Ontario, the only known population in the province is on Pelee Island, with very rare sightings elsewhere in the province at points close to the border with the United States. This species inhabits deciduous forests and marshes and will den in a variety of features including rock outcroppings, hollow trees, burrows or brush piles, usually where dense brush provides cover and in close proximity to water. This species is considered a habitat generalist (COSEWIC 2015).	Low	The only known population in the province is on Pelee Island.

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Little brown myotis	<i>Myotis lucifugus</i>	END	END	END	S3	In Ontario, this specie's range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate	There was no suitable maternity roosting habitat observed on the site or in the forest immediately adjacent to the site along the Georgian Bay shoreline. Off-site the forests in the western and southern portions of the study area may provide suitable roosting habitat for this species. In addition, the off-site houses throughout these portions of the study area may provide suitable anthropogenic roosting habitat.
Northern myotis	<i>Myotis septentrionalis</i>	END	END	END	S3	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate	There was no suitable maternity roosting habitat observed on the site or in the forest immediately adjacent to the site along the Georgian Bay shoreline. Off-site the forests in the western and southern portions of the study area may provide suitable roosting habitat for this species.
Tri-colored bat	<i>Perimyotis subflavus</i>	END	END	END	S3?	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	Moderate	There was no suitable maternity roosting habitat observed on the site or in the forest immediately adjacent to the site along the Georgian Bay shoreline. Off-site the forests in the western and southern portions of the study area may provide suitable roosting habitat for this species.
Eastern ribbonsnake - Great Lakes population	<i>Thamnophis sauritus</i>	SC	SC	SC	S4	In Ontario, eastern ribbonsnake is semi-aquatic, and is rarely found far from shallow ponds, marshes, bogs, streams or swamps bordered by dense vegetation. They prefer sunny locations and bask in low shrub branches. Hibernation occurs in mammal burrows, rock fissures or even ant mounds (COSEWIC 2012).	Low	There were no aquatic areas with dense vegetation observed on the site or within the study area.
Massasauga rattlesnake - Great Lakes / St.Lawrence population	<i>Sistrurus catenatus</i>	THR	THR	THR	S3	In Ontario, the Massasauga rattlesnake occurs in four separate regional populations: eastern Georgian Bay, Bruce peninsula and Manitoulin Island, Wainfleet bog, and the Ojibway Prairie complex in Windsor. This snake species uses a wide variety of habitats across its range, all of which share specific characteristics, including open areas for basking and areas of vegetation and rock for shelter. They are most typically associated with wetlands and damp areas/lowlands during the spring. They forage in shrubby fields and grasslands in the summer months. Hibernation sites are often associated with wetlands or wet depressions, in rock fissures, mammal and crayfish burrows, sphagnum hummocks and tree root systems, where snakes will access the area below the frost line, but above the water table. Gestation habitat includes areas with low canopy closure such as bedrock outcrops with vegetative cover and a large structure such as a table rock for refuge during this period (MNR 2016).	Low	The open area on the site surrounded by dense urban properties throughout the study area do not likely provide suitable habitat for this species.

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Milksnake	<i>Lampropeltis triangulum</i>	NAR	SC	SC	S4	In Ontario, milksnake uses a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations (COSEWIC 2014).	Low	The open area on the site surrounded by dense urban properties throughout the study area do not likely provide suitable habitat for this species.
Snapping turtle	<i>Chelydra serpentina</i>	SC	SC	SC	S3	In Ontario, snapping turtle uses a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways (COSEWIC 2008).	Low	Meaford Creek in the southeast corner of the site is unlikely to provide suitable aquatic habitat due to a lack of aquatic vegetation.
American ginseng	<i>Panax quinquefolius</i>	END	END	END	S2	In Ontario, American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in well-drained soils of glacier origin that have a neutral pH (ECCC 2018).	Low	The forests on the site and within the study area are likely too disturbed to provide suitable habitat.
American hart's-tongue fern	<i>Asplenium scolopendrium</i>	SC	SC	SC	S3	In Ontario, American hart's-tongue fern grows on thin calcareous soils on or near dolomitic limestone of the Niagara Escarpment, and occasionally on open talus/scree slopes. Most populations are found on steep, moderately moist slopes that face north to northeast and are under a hardwood canopy cover (Environment Canada 2013).	Low	There are no suitable slopes on the site or within the study area.
Butternut	<i>Juglans cinerea</i>	END	END	END	S2?	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Low	Although the forest edges on the site and within the study area may provide suitable habitat, this species was not observed during the site reconnaissance. In addition, there are no known records for this species in the vicinity of Meaford.
Eastern prairie fringed-orchid	<i>Platanthera leucophaea</i>	END	END	END	S2	In Ontario, eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates, and occasionally grows along roadsides or lake margins (Eastern Prairie Fringed-orchid Recovery Team 2010). This species is found only in southern Ontario, and only two locations are currently known on sand spits along the shore of Lake Erie.	Low	Only two locations are currently known on sand spits along the shore of Lake Erie, which does not overlap the study area.
Hill's pondweed	<i>Potamogeton hillii</i>	SC	SC	SC	S2S3	In Ontario, Hill's pondweed grows in the muddy substrates of cold, clear, slow-moving, calcareous streams, ditches, and ponds. It is found in water up to 1 m in depth. Often found near flow obstructions including the upstream side of road culverts, among stumps and fallen trees, or in shallow water among rushes and sedges (Parks Canada Agency 2014).	Low	This species is not known to occur in the vicinity of the study area ((Parks Canada Agency 2014).
Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	SC	SC	SC	S2	In Ontario, tuberous Indian-plantain grows along riverbanks and in wetlands near Lake Huron, especially along the west side of the Bruce Peninsula. It prefers open sunny areas in wet, calcium-rich meadows or shoreline fens (COSEWIC 2002).	Low	This species is not known to occur in the vicinity of the study area (COSEWIC 2002).

NOTES:

- ¹ *Endangered Species Act* (ESA), 2007. General (O.Reg 242/08 last amended 29 June 2020 as O.Reg 328/20). Species at Risk in Ontario List (O.Reg 230/08 last amended 1 Aug 2018 as O. Reg 404/18, s. 1.); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)
- ² *Species at Risk Act* (SARA), 2002. Schedule 1 (Last amended 25 January 2020); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)
- ³ Committee on the Status of Endangered Wildlife in Canada (COSEWIC) <http://www.cosewic.gc.ca>
- ⁴ Provincial Ranks (SRANK) are Rarity Ranks assigned to a species or ecological communities, by the Natural Heritage Information Centre (NHIC). These ranks are not legal designations. SRANKS are evaluated by NHIC on a continual basis and updated lists produced annually. SX (Presumed Extirpated), SH (Possibly Extirpated - Historical), S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (Not Applicable), S#S# (Range Rank), S? (Not ranked yet), SAB (Breeding Accident), SAN (Non-breeding Accident), SX (Apparently Extirpated). Last assessed November 2017.
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