

Appendix C: Ministry of Natural Resources and Forestry Species at Risk Assessment

Cailey McCutcheon

From: Laurence, Anne Marie (MNRF) <annemarie.laurence@ontario.ca>
Sent: August 8, 2016 11:55 AM
To: Rob Amos
Subject: RE: Species at Risk Screening
Attachments: Guelph_Information_Request_FillableForm.pdf; Hamilton SAR List August 8 2016.pdf

Hi Rob

The Ministry of Natural Resources and Forestry (MNRF), Guelph District Office, has reviewed the natural heritage information available for the study area associated with the Mathers Drive neighbourhood in the City of Hamilton and offer the following comments:

For all future information requests/SAR screenings, to ensure that we have all of the information we need to respond in a timely manner, we require that you complete and submit **Guelph District's Natural Heritage Information Request Form (please see attachment)**.

Please be advised that there are records in the area for the for the following species at risk (SAR): Chimney Swift (threatened). There is also a possibility for Butternut (endangered) to occur in the study area. However, please note that because the province has not been surveyed comprehensively for the presence of listed species, the absence of a record is not an appropriate indicator for the absence of SAR/SAR habitat from an area.

To determine the presence of SAR for a given study area, the District's recommended approach includes the following:

I. Habitat Inventory

MNRF staff recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. With respect to aquatic habitats in the study area, we recommend you collect data on the physical characteristics of the waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential Species at Risk within the Study Area

A list of SAR that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of SAR known to occur within the planning area. The list of SAR known to occur in **the City of Hamilton** is attached for your reference. The species-specific COSEWIC status reports (www.cosewic.gc.ca) are a good source of information on habitat needs and will be helpful in determining the suitability of the study areas ecosites for a given species.

Please note that the Species at Risk in Ontario list (SARO) is a living document and is amended periodically as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO list can be accessed on the webpage <https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>.

COSSARO also maintains a list of species to be assessed in the future. It is recommended to take COSSARO's list of anticipated assessments into consideration, especially when the proposed start

date of the activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. The list can be viewed at <http://www.ontario.ca/environment-and-energy/help-protect-species-risk>.

SAR habitat prescribed under regulation can be accessed on the Environmental Registry and searching for postings related to Ontario Regulation 242/08 under the *Endangered Species Act*.

III. Species at Risk Surveys

Ministry staff are of the opinion that each SAR identified under Step II should be surveyed for, regardless of whether or not the species has been previously recorded in the area. The survey report should describe how each SAR was surveyed for, and provide a rationale for why certain species were not afforded a survey (e.g., habitat within the study area is not suitable for a specific SAR). Please note that some targeted surveys may require provincial authorizations.

We additionally recommend contacting the municipality and the conservation authority to determine if they have any additional information or records of interest for the study area.

I trust the above information is of assistance.

Best regards,

Anne Marie

Anne Marie Laurence

Management Biologist
Ministry of Natural Resources & Forestry
Guelph District
(519) 826-4132

From: Rob Amos [<mailto:amos.r@aquaforbeech.com>]
Sent: June-29-16 9:36 AM
To: ESA Aurora (MNRF); Thompson, Melinda (MNRF)
Cc: maunder.d@aquaforbeech.com; McCutcheon, Cailey
Subject: Species at Risk Screening

Hi Melinda,

We're undertaking a project in Hamilton in which we'd like to confirm presence of any Species at Risk.

I've attached a study area figure, which highlights the area within rear properties along Mathers Drive in Hamilton.

Can you or your staff please provide and SAR records to be considered.

Thanks,

Rob

Robert Amos M.A.Sc. P.Eng.
Fluvial Geomorphologist
905.629.0099 x 284
amos.r@aquaforbeech.com

| Amphibian | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |
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| Jefferson Salamander <i>Ambystoma jeffersonianum</i> | END | Species Protection and Habitat Regulation | Inhabits deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs. | Active: March – October Hibernates: October – March Breeding: Late March - Mid April | Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol |
| Bird | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |
| Acadian Flycatcher <i>Empidonax virescens</i> | END | Species Protection and General Habitat Protection | Generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines. | Migrate South before Winter | Follow Breeding Bird Survey Protocol |
| Bald Eagle <i>Haliaeetus leucocephalus</i> | SC | N/A | Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers. They roost in super canopy trees such as Pine. | Breed and Nest - April or May Some Migrate South when waterbodies freeze over | Follow Breeding Bird Survey Protocol |
| Bank Swallow <i>Riparia riparia</i> | THR | Species Protection and General Habitat Protection | It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers. | Migrate South before Winter | Follow Breeding Bird Survey Protocol. Colony and Roost information should be recorded and submitted using Bird Studies Canada's Ontario Bank Swallow Project data forms (2010). |
| Barn Owl <i>Tyto alba</i> | END | Species Protection and Habitat Regulation | Generally prefer low-elevation, open country; often associated with agricultural lands, especially pasture. Nests are located in buildings, hollow trees and cavities in cliffs. | Active Year Round Some leave for the Winter | Follow Breeding Bird Survey Protocol Night surveys may be helpful as they are very vocal |
| Barn Swallow <i>Hirundo rustica</i> | THR | Species Protection and General Habitat Protection | Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc. | Migrate South before Winter | Follow Breeding Bird Survey Protocol |

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| Black Tern <i>Chlidonias niger</i> | SC | N/A | Generally prefer freshwater marshes and wetlands; nest either on floating material in a marsh or on the ground very close to water | Migrate South for the Winter | Follow Breeding Bird Survey Protocol |
| Bobolink <i>Dolichonyx oryzivorus</i> | THR | Species Protection and General Habitat Protection | Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands | Migrate South for the Winter | Contact MNR Guelph District Management Biologist to obtain a copy of the protocol |
| Canada Warbler <i>Cardellina canadensis</i> | SC | N/A | Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest. | Arrive in Early May Migrate South for the Winter | Follow Breeding Bird Survey Protocol |
| Cerulean Warbler <i>Setophaga cerulea</i> | THR | Species Protection and General Habitat Protection | Generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests. | Migrate South for the Winter | Follow Breeding Bird Survey Protocol |
| Chimney Swift <i>Chaetura pelagica</i> | THR | Species Protection and General Habitat Protection | Historically found in deciduous and coniferous, usually wet forest types, all with a well developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys | Nesting - Late April to Mid-May Migrate South in September or Early October | Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009 |
| Common Nighthawk <i>Chordeiles minor</i> | SC | N/A | Generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops). | Migrate South for the Winter | Contact MNR Guelph District Management Biologist to obtain a copy of the protocol |

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| Eastern Meadowlark <i>Sturnella magna</i> | THR | Species Protection and General Habitat Protection | Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps. | Migrate South for the Winter | Contact MNR Guelph District Management Biologist to obtain a copy of the protocol |
| Eastern Whip-poor-will <i>Caprimulgus vociferus</i> | THR | Species Protection and General Habitat Protection | Generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas. | Nesting: May - July | Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol |
| Eastern Wood-Pewee <i>Contopus virens</i> | SC | N/A | Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges. | Migrate South for the Winter | Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol |
| Golden-winged Warbler <i>Vermivora chrysoptera</i> | SC | N/A | Generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas. | Migrate South for the Winter | Follow Breeding Bird Survey Protocol |
| Henslow's Sparrow <i>Ammodramus henslowii</i> | END | Species Protection and General Habitat Protection | Generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material | Migrate South for the Winter | Follow Breeding Bird Survey Protocol |
| King Rail <i>Rallus elegans</i> | END | Species Protection and General Habitat Protection | Generally this species requires large marshes with open shallow water that merges with shrubby areas | Breed from Late April to mid-May Migrate South for the Winter | Follow Marsh Monitoring Protocol. |
| Least Bittern <i>Ixobrychus exilis</i> | THR | Species Protection and General Habitat Protection | Generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants | Migrate South for the Winter | Follow Marsh Monitoring Protocol; 10 day window of male calling (variable timing). Does not respond well to playback. Very difficult to detect. |

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| Louisiana Waterthrush <i>Seiurus motacilla</i> | SC | N/A | Generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps | Migrate South for the Winter | Follow Breeding Bird Survey Protocol |
| Peregrine Falcon <i>Falco peregrinus</i> | SC | N/A | Generally nest on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated downtown areas. | Active Year Round - Lay Eggs around Easter Hatching occurs around Mother's Day Young fledge around Father's | Visit ideal habitat locations and listen/look for individuals in the vicinity. |
| Prothonotary Warbler <i>Protonotaria citrea</i> | END | Species Protection and General Habitat Protection | Generally found in the dead trees of flooded woodlands or deciduous swamp forests; Carolinia Zone | Migrate South for the Winter Eggs are laid from Late May - Early July | Follow Breeding Bird Survey Protocol |
| Red-Headed Woodpecker <i>Melanerpes erythrocephalus</i> | SC | N/A | Generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks | Active from May to September | Follow Breeding Bird Survey Protocol |
| Short-eared Owl <i>Asio flammeus</i> | SC | N/A | Generally prefers a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations, old pastures and agricultural fields | Active Year Round | Contact MNRG Guelph District Management Biologist to obtain a copy of the protocol |
| Wood Thrush <i>Hylocichla mustelina</i> | SC | N/A | Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments. | Migrate South for the Winter Arrive in Ontario in mid to late spring | Follow Breeding Bird Survey Protocol |
| Yellow-breasted Chat <i>Icteria virens</i> | END | Species Protection and General Habitat Protection | Generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings | Migrate South for the Winter Arrive in Ontario Early May | Follow Breeding Bird Survey Protocol |

| Fish | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |
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| American Eel <i>Anguilla rostrata</i> | END | Species Protection and General Habitat Protection | All fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean; 12-mile Creek watershed and Lake Ontario | Active Year Round | Electrofishing For information please contact your local MNRF office, CA or DFO |
| Grass Pickerel <i>Esox americanus vermiculatus</i> | SC | N/A | Generally occur in wetlands with warm, shallow water and an abundance of aquatic plants; occur in the St. Lawrence River, Lake Ontario, Lake Erie, and Lake Huron | Spawn from late March to early May | For information please contact your local MNRF office, CA and/or DFO |
| Redside Dace <i>Clinostomus elongatus</i> | END | Species Protection and Habitat Regulation | Generally found in pools and slow-moving areas of small headwater streams with a moderate to high gradient | Spawning occurs in May | Contact MNR Guelph District Management Biologist to obtain a copy of the protocol |
| Silver Shiner <i>Notropis photogenis</i> | THR | Species Protection and General Habitat Protection | Generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients | Spawning occurs in May and June | For information please contact your local MNRF office, CA and/or DFO |
| Insect | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |
| Monarch Butterfly <i>Danaus plexippus</i> | SC | N/A | Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces | Usually migrate south in late September and October | Watch for adults along roadsides and in open fields. Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant. |
| Mottled Duskywing <i>Erynnis martialis</i> | END | Species Protection and General Habitat Protection | Generally inhabits a range of grassland, shrubland, and savanna habitats that contain well drained soils and the presence of its host plants Prairie Redroot (<i>Ceanothus herbaceus</i>) or New Jersey Tea (<i>Ceanothus americanus</i>). | Adult butterfly emerges from pupa in late March and early April | Watch for adults near host plants or search for caterpillars on the host plant Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant. |

| West Virginia White <i>Pieris virginiensis</i> | SC | N/A | Generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (<i>Cardamine diphylla</i>), which is a small, spring-blooming plant of the forest floor. | Adult butterfly emerges from pupa in late March; flies only in April and May | Watch for adults within moist, deciduous woodlands Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. Adults can be spotted from a distance; caterpillars must be searched for carefully by checking host plant |
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| Mammal | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |
| American Badger <i>Taxidea taxus</i> | END | Species Protection and Habitat Regulation | Generally prefers open habitats, whether natural (grasslands) or man-made (agricultural fields, road right-of-ways, golf courses). | Breed: Late Summer Semi-dormant over Winter | Determine if soils are suitable (sandy or loamy) Dens and Woodchuck burrows should be surveyed for use |
| Eastern Small-footed Myotis <i>Myotis leibii</i> | END | Species Protection and General Habitat Protection | Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark. | Hibernates in caves and mines during winter | Contact MNRG Guelph District Management Biologist to obtain a copy of the protocol |
| Little Brown Myotis <i>Myotis lucifugus</i> | END | Species Protection and General Habitat Protection | Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh). | Hibernates during winter | Contact MNRG Guelph District Management Biologist to obtain a copy of the protocol |
| Northern Myotis <i>Myotis septentrionalis</i> | END | Species Protection and General Habitat Protection | Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.) | Hibernates during winter | Contact MNRG Guelph District Management Biologist to obtain a copy of the protocol |

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| Tri-coloured Bat <i>Perimyotis subflavus</i> | END | Species Protection and General Habitat Protection | Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures. | Hibernates during winter | Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol |
| Woodland Vole <i>Microtus pinetorum</i> | SC | N/A | Generally associated with deciduous forests in areas of soft, friable, often sandy soil beneath deep humus, where it can burrow easily. | Active Year Round | Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol |
| Mollusc | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |
| Eastern Pondmussel <i>Ligumia nasuta</i> | END | Species Protection and General Habitat Protection | Generally inhabit sheltered areas of lakes or slow streams in substrates of fine sand and mud | Active Year Round | Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008). |
| Lilliput <i>Taxolasma parvum</i> | END | Species Protection and General Habitat Protection | Found in a variety of habitats including small to large rivers, wetlands, shallows of lakes, ponds and reservoirs. They are common in soft substrates with over 50% of the substrate type comprised of sand and a mud/muck/silt combination. Typically occur with or near Green Sunfish, Bluegill, White Crappie, and Johnny Darter | Active Year Round | Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008): Print. |
| Rainbow Mussel <i>Villosa iris</i> | THR | Species Protection and General Habitat Protection | Most abundant in shallow, well-oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud | Active Year Round | Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008): Print. |
| Plant | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |

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| <p>American Chestnut</p> <p><i>Castanea dentata</i></p> | END | Species Protection and General Habitat Protection | Found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils. | Flowers occur in Late Spring and Early Summer | <p>Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters</p> <p>Use a plant field guide to distinguish from similar species</p> <p>Perform detailed floristic inventory</p> <p>Look for distinctive fruits on the ground</p> |
| <p>American Columbo</p> <p><i>Frasera caroliniensis</i></p> | END | Species Protection and General Habitat Protection | Most commonly associated with open deciduous forested slopes, thickets and clearings; grows in a variety of relatively stable habitats as well as on a wide variety of soils. | <p>Germination and development of the rosette begin in early spring</p> <p>Flowers open in May</p> <p>Fruit production continues</p> | <p>Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters</p> <p>Use a plant field guide to distinguish from similar species</p> <p>Look for spikes from last years flowers</p> |
| <p>American Ginseng</p> <p><i>Panax quinquefolius</i></p> | END | Species Protection and General Habitat Protection | Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock). | <p>Flowering begins in June and continues until August</p> <p>The fruit develop from July to August and ripen in August and September</p> | <p>Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters</p> <p>Use a plant field guide to distinguish from similar species</p> |
| <p>Broad Beech Fern</p> <p><i>Phegopteris hexagonoptera</i></p> | SC | N/A | Generally inhabits shady areas of beech and maple forests where the soil is moist or wet | The frond of the Broad Beech Fern appears towards the end of May | <p>Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters</p> <p>Use a plant field guide to distinguish from similar species</p> |
| <p>Butternut</p> <p><i>Juglans cinerea</i></p> | END | Species Protection and General Habitat Protection | Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows | Flowers from April to June. Fruits reach maturity during the month of September or October | Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut. Use Butternut Health Assessment Protocol if planning on removing trees. |
| <p>Eastern Flowering Dogwood</p> <p><i>Cornus florida</i></p> | END | Species Protection and Habitat Regulation | Generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; Also grows around edges and hedgerows | <p>Flowering occurs in mid-May, just as the leaves begin to develop.</p> <p>Fruit turns red at the end of summer.</p> | <p>Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters</p> <p>Use a plant field guide to distinguish from similar species</p> <p>Easiest to detect during Spring when in flower</p> <p>Also look for distinctive bark</p> |

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| Few-flowered Club-rush <i>Trichophorum planifolium</i> | END | Species Protection and Habitat Regulation | Generally found in Dry Fresh Oak deciduous forests and Dry Fresh Oak-Maple-Hickory deciduous forests (only found on RBG property). | Plants flower early before the forest canopy | Seaches for this species should only be done in March or April, when the species is most visible Walk slowly and systematically in grid fashion, pausing to scan for plants every 1 meters Distinguishing this species from similar species is difficult |
| Green Dragon <i>Arisaema dracontium</i> | SC | N/A | Generally grows in damp deciduous forests and along streams. | Flowering occurs in May and June | Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species |
| Hoary Mountain-mint <i>Pycnanthemum incanum</i> | END | Species Protection and General Habitat Protection | Oak savannas and prairies, dry sites. | Flowering occurs in July | Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species |
| Red Mulberry <i>Morus rubra</i> | END | Species Protection and General Habitat Protection | Generally grows in moist forest habitats. In Ontario, these include slopes and ravines of the Niagara Escarpment, and sand spits and bottom lands; Can grow in open areas such as hydro corridors | Flowering occurs when leaves emerge in late spring. Fruit emerges in Mid-July. | Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from the similar White Mulberry Distinguishing Red Mulberry and the hybrid Red and White Mulberry will require the collection of leaves for generic testing, which requires a 17(2)(b) permit |
| Spotted Wintergreen <i>Chimaphila maculata</i> | END | Species Protection and General Habitat Protection | Generally grow in sandy habitats in dry-mesic oak-pine woods. | Flowering occurs in late July to early August | Watch for the distinct evergreen leaves in suitable habitat May be easiest to search in fall and spring |
| White Wood Aster <i>Eurybia divaricata</i> | THR | Species Protection and General Habitat Protection | Generally grows in open, dry, deciduous forests. It has been suggested that it may benefit from some disturbance, as it often grows along trails. | Flowering occurs in early September, and sets fruit later in the month | Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species |
| Reptile | SARO | Protection | Habitat Information | Timing Windows | Survey Protocol |

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| <p>Blanding's Turtle <i>Emydoidea blandingii</i></p> | <p>THR</p> | <p>Species Protection and General Habitat Protection</p> | <p>Generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.</p> | <p>Eggs are laid in June, with hatchlings emerging in late September and early October.</p> | <p>Contact MNR Guelph District Management Biologist to obtain a copy of the protocol</p> |
| <p>Eastern Hog-nosed Snake <i>Heterodon platirhinos</i></p> | <p>THR</p> | <p>Species Protection and General Habitat Protection</p> | <p>Generally prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water.</p> | <p>Mating occurs in spring and in August and early September. Eggs are laid in June. Hatching occurs in late August or early September</p> | <p>In early spring, look for individuals near ideal hibernation sites During egg-laying period (June), look for nesting females in sandy areas in early morning and late evening. Rest of the season, survey intensively and systematically by flipping rocks</p> |
| <p>Eastern Ribbonsnake <i>Thamnophis sauritus</i></p> | <p>SC</p> | <p>N/A</p> | <p>Generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.</p> | <p>Hibernate: October - April Mating: Early Spring Hatching: Early Fall (September)</p> | <p>Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol</p> |
| <p>Northern Map Turtle <i>Graptemys geographica</i></p> | <p>SC</p> | <p>N/A</p> | <p>Generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.</p> | <p>Active: At night Hibernate: October - April Hatching: Late August - Early September</p> | <p>Scan shoreline in spring and partially submerged logs/rocks in summer for basking turtles Be aware that map turtles do not allow as close of approach as other turtles before leaving a basking site Snorkel in desired aquatic habitat</p> |

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| Snapping Turtle <i>Chelydra serpentina</i> | SC | N/A | Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. | Nesting: Late May and June Hibernate: October - April | Scan offshore rocks and logs for basking turtles (10am-2pm) Snorkel in desired aquatic habitat Nesting Season: Search known or preferred nesting habitat areas for females |
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| Spiny Softshell <i>Apalone spinifera</i> | THR | Species Protection and General Habitat Protection | Generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers | Lay eggs in June or July Hibernate over winter | Best time to survey is during nesting season when females are active laying eggs Visual searches should be conducted in appropriate habitat |
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ONTARIO MINISTRY of NATURAL RESOURCES and FORESTRY | GUELPH DISTRICT OFFICE
1 Stone Road West, Guelph, Ontario, N1G 4Y2 esa.guelph@ontario.ca

| Species | | COSEWIC Status | COSSARO Status | G-Rank | S-Rank | City of Hamilton | Observation Date | Source | Habitat Requirements* | Assessment of Species Occurrence in Study Area |
|---------------------------------|----------------------------------|----------------|----------------|--------|-------------|------------------|------------------|-------------------------------|--|---|
| Scientific Name | Common Name | | | | | | | | | |
| AMPHIBIANS | | | | | | | | | | |
| <i>Ambystoma jeffersonianum</i> | Jefferson Salamander | END | END | G4 | S2 | Rare | - | MNRF/ Hamilton NAI 2014 | Woodland vernal pools devoid of predatory fish. Damp, shady deciduous forest, swamps, moist pasture, lakeshores. Uses temporary woodland pools for breeding. Hides under leaf litter, stones or decomposing logs. | Not present: Preferred habitat (i.e. vernal pools) are not present within the study area. |
| BIRDS | | | | | | | | | | |
| <i>Empidonax virescens</i> | Acadian Flycatcher | END | END | G5 | S2, S3B | Rare | - | MNRF | Generally requires large areas of mature, undisturbed forest; avoids the forest edge; found in well wooded swamps and ravines. | Not present: Preferred habitat (i.e. interior forest) not present in the study area and species is not identified as occurring in the Devil's Punchbowl Escarpment natural area. |
| <i>Haliaeetus leucocephalus</i> | Bald Eagle | NAR | SC | G5 | S2N, S4B | Rare | - | MNRF | Prefers deciduous and mixed deciduous forest; and habitat close to water bodies such as lakes and rivers. | Not present: Preferred habitat not present and species is not identified as occurring in the Devil's Punchbowl Escarpment natural area. The only breeding pair of bald eagles in Hamilton is in the Cootes Paradise natural area. |
| <i>Riparia riparia</i> | Bank Swallow | THR | THR | G5 | S4B | Uncommon | - | MNRF/ Hamilton NAI 2014 | Sand, clay or gravel riverbanks or steep riverbank cliffs; lakeshore bluffs or easily crumbled sand or gravel; gravel pits, road cuts, grassland or cultivated fields that are close to water. Nesting sites are limiting factor for species presence. | Not present: Preferred habitat is not present within the study area. Based on site inspections, the stream banks are not seep enough to present as preferred nesting habitat. |
| <i>Tyto alba</i> | Barn Owl | END | END | G5 | S1 | Extirpated | - | MNRF | Open areas such as fields, agricultural lands with scattered woodlots, old buildings, orchards, grasslands, sedge meadows, marshes. Intolerance to severe cold. Nests in hollow trees and live trees >46 cm dbh or barns and abandoned buildings. | Not present: Species is Extirpated from Hamilton (Schwetz, 2014). |
| <i>Hirundo rustica</i> | Barn Swallow | THR | THR | G5 | S4B | Common | - | MNRF/ Hamilton NAI 2014 | Prefers farmland, lake/river shorelines, wooded clearings, urban populated areas, rocky cliffs and wetlands. They nest inside or outside buildings, under bridges and in road culverts, or on rock faces and caves. | Not present: Preferred habitat is not present in the study area. |
| <i>Nycticorax nycticorax</i> | Black-crowned heron Night- | - | - | G5 | S3B S3N | Uncommon | - | NHIC Database | Shallow cattail and bulrush marshes, lakeshores, and along slow rivers (Bezener, 2000). | Not present: Preferred habitat is not present within the study area. This species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014). |
| <i>Chlidonias niger</i> | Black Tern | NAR | SC | G4 | S3B | Extirpated | - | MNRF | Freshwater marshes and wetlands. | Not present: Species is Extirpated in from Hamilton (Schwetz, 2014). |

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| Scientific Name | Common Name | | | | | | | | | |
| <i>Dolichonyx oryzivorus</i> | Bobolink | THR | THR | G5 | S4B | Uncommon | - | MNRF | COSEWIC (2010, p. iv) defines bobolink habitat as follows: "Since the conversion of the prairie to cropland and the clearing of the eastern forests, the Bobolink has nested in forage crops...The bobolink also occurs in various grassland habitats including wet prairie, graminoid peatlands and abandoned fields dominated by tall grasses, remnants of uncultivated virgin prairie (tall-grass prairie), no-till cropland, small-grain fields, restored surface mining sites and irrigated fields in arid regions." | Not present: Preferred habitat is not present in the study area. |
| <i>Cardellina canadensis</i> | Canada Warbler | THR | SC | G5 | S4B | Rare | - | MNRF/ Hamilton NAI 2014 | Generally prefers wet coniferous deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest. | Not present: Preferred habitat not present within study area. The understory is sparse and open. According to the Hamilton NAI (2014) this species is restricted to the northwest part of Hamilton, in Flamborough. |
| <i>Setophaga cerulean</i> | Cerulean Warbler | END | THR | G4 | S3B | Rare | - | MNRF | Generally found in mature deciduous forests with an open understory . | Not present: Preferred habitat is not present within the study area. This species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwet, 2014). |
| <i>Chaetura pelagica</i> | Chimney Swift | THR | THR | G5 | S4B, S4N | Uncommon | - | MNRF/ Hamilton NAI 2014 | Historically found in deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer. Now, most are found in urban areas in large, uncapped chimneys. | Present/Confirmed: Correspondence with the MNRF states that this species is in the area of the proposed works. Preferred nesting habitat (chimneys) not present within the study area. As this species is an aerial insectivore, potential foraging habitat exists above the stream valley. |
| <i>Chordeiles minor</i> | Common Nighthawk | THR | SC | G5 | S4B | Rare | - | MNRF | Open ground; Clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs. | Not present: Preferred habitat is not present within the study area. |
| <i>Sturnella magna</i> | Eastern Meadowlark | THR | THR | G5 | S4B | Uncommon | - | MNRF | Open grasslands and hay fields. The MNRF defines general habitat as the nest and suitable habitat within 300 metres of a nest or centre of defended territory (MNRF 2013). | Not present: Preferred habitat is not present within the study area, and the nearest farm fields are over 300 m away from the edge of the study area. |
| <i>Caprimulgus vociferous</i> | Eastern Whip-poor-will | THR | THR | G5 | S4B | Rare | - | MNRF | Generally prefer semi-open deciduous forests or patchy forests with clearings; areas with littler ground cover are also preferred. | Not present: Preferred habitat is not present within the study area. This species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwet, 2014). |
| <i>Contopus virens</i> | Eastern Wood-Pewee | SC | SC | G5 | S4B | Common | - | MNRF | Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges. | Possible: Preferred habitat is present within the study area. |

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| Scientific Name | Common Name | | | | | | | | | |
| <i>Vermivora chrysoptera</i> | Golden-winged Warbler | THR | SC | G4 | S4B | Rare | - | MNRF | Generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas. | Not present: Preferred habitat is not present within the study area. This species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014). |
| <i>Ammodramus henslowii</i> | Henslow's Sparrow | END | END | G4 | NHB | Extirpated | - | MNRF | Large, fallow grassy area with ground mat of dead vegetation, dense herbaceous vegetation, ground litter and some song perches; neglected weedy fields; wet meadows; cultivated uplands; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha. | Not present: Species is Extirpated from Hamilton. |
| <i>Rallus elegans</i> | King Rail | END | END | G4 | S2B | Extirpated | - | MNRF | Generally requires large marshes with open shallow water that merges with shrubby areas (MNRF 2000) | Not present: Species is Extirpated from Hamilton. |
| <i>Ixobrychus exilis</i> | Least Bittern | THR | THR | G5 | S4B | Rare | - | MNRF | Generally located near pools of open water in relatively large marshes and swamps dominated by cattail and other robust emergent plants. | Not present: Preferred habitat is not present within the study area. |
| <i>Seiurus motacilla</i> | Louisiana Waterthrush | THR | SC | G5 | S3B | Rare | - | MNRF | Generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps. | Not present: Preferred habitat is not present within the study area and this species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014). |
| <i>Falco peregrinus</i> | Peregrine Falcon | SC | SC | G4 | S3B | Rare | - | MNRF | Nests on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated areas. | Not present: Preferred habitat is not present within the study area and this species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014). The only known breeding pair of peregrine falcons in Hamilton is on the Sheridan Hotel downtown. |
| <i>Protonotaria citrea</i> | Prothonotary Warbler | END | END | G5 | S1B | Rare | - | MNRF | Generally found in the dead trees of flooded woodlands or deciduous swamp forests; Carolinian Zone. | Not present: Preferred habitat is not present within the study area and this species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014). |

| Species | | COSEWIC Status | COSSARO Status | G-Rank | S-Rank | City of Hamilton | Observation Date | Source | Habitat Requirements* | Assessment of Species Occurrence in Study Area |
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| Scientific Name | Common Name | | | | | | | | | |
| <i>Melanerpes erythrocephalus</i> | Red-Headed Woodpecker | THR | SC | G5 | S4B | Rare | - | MNRF | COSEWIC (2007c, p. iv) defines red-headed woodpecker habitat as follows: "The Red-headed Woodpecker is found in a variety of habitats, including oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, beaver ponds and burns." | Possible: Suitable habitat is present within the study area. This species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014); however that may be because the valleylands accompanying the study area were not targeted during breeding bird surveys. It is likely that breeding bird surveys were conducted along the Niagara escarpment, where access into the natural area is easier (i.e. the Bruce Trail) and readily available than within these valleylands that are surrounded by private residential properties. |
| <i>Asio flammeus</i> | Short-eared Owl | SC | SC | G5 | S2N, S4B | Rare | - | MNRF | Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25-125 ha; requires 75-100 ha of coniferous open habitat. Also prefers old pastures and agricultural fields. | Not present: Preferred habitat is not present within the study area. |
| <i>Hylocichla mustelina</i> | Wood Thrush | THR | SC | G5 | S4B | Common | - | MNRF | Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments. | Not present: Preferred habitat is not present within the study area. The understory within the study area is sparse and open. This species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014). |
| <i>Icteria virens</i> | Yellow-breasted Chat | END | END | G5 | S2B | Rare | - | MNRF | Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc. | Not present: Preferred habitat is not present within the study area. This species has not been recorded in the Devil's Punchbowl Escarpment natural area (Schwetz, 2014). |
| FISH | | | | | | | | | | |
| <i>Anguilla rostrata</i> | American Eel | THR | END | G4 | S1? | Rare | - | MNRF | All freshwater estuaries and coastal wetlands that are attached to the Atlantic Ocean; 12 Mile Creek watershed and Lake Ontario. | Not present: Suitable habitat not present in study area. |
| <i>Esox americanus vermicularus</i> | Grass Pickerel | SC | SC | G5T5 | S3 | Common | - | MNRF | Warm, slow-moving streams, ponds and shallow bays of larger lakes, with clear to tea-coloured water, and abundant aquatic vegetation. Bottom substrate is usually mud, but it has also been found over rock and gravel. (MNRF 2015) | Not present: Suitable habitat not present in study area. |
| <i>Clinostomus elongatus</i> | Redside Dace | END | END | G3G4 | S2 | Rare (Extirpated?) | - | MNRF | Found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. They are generally found in areas with overhanging grasses and shrubs. (MNRF 2015) | Not present: Suitable habitat not present in study area. Only found within 12 Mile Creek and the Welland River in Hamilton. |

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| Scientific Name | Common Name | | | | | | | | | |
| <i>Notropis photogenis</i> | Silver Shiner | THR | THR | G5 | S2S3 | - | - | MNRF | Prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms, and moderate to high gradients. (MNRF 2015) | Not present: Suitable habitat not present in study area. |
| INSECT | | | | | | | | | | |
| <i>Danaus plexippus</i> | Monarch | SC | SC | G5 | S2N,S4B | Common | - | MNRF | Exist primarily where milkweed and wildflowers exist. This includes abandoned farmland, roadsides and other open spaces. | Not Present: Preferred habitat not found in study area. |
| <i>Pieris virginiensis</i> | West Virginia White | - | SC | G3? | S3 | Uncommon | - | MNRF | Generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (<i>Cardamine diphylla</i>), which is a small, spring-blooming plant of the forest floor. | Not present: In Hamilton, this species is found within Flamborough and Ancaster (Schwetz, 2014). |
| <i>Erynnis martialis</i> | Mottled Duskywing | END | END | G3 | S2 | Rare | - | MNRF | Dry habitats with sparse vegetation. These include open barrens, sandy patches among woodlands, and alvars. In Ontario, the mottled duskywing will only deposit their eggs on two closely-related plants: New Jersey tea and prairie redroot. (MNRF 2015) | Not present: According to the 2014 Hamilton NAI, only found in the Waterdown Escarpment Woods and Clappison Escarpment Woods natural areas. |
| MAMMALS | | | | | | | | | | |
| <i>Taxidea taxus</i> | American Badger | END | END | G5 | S2 | Rare | - | MNRF | Open grasslands and oak savannahs; dens in new hole or enlarged existing hole; sometimes makes food caches. | Not present: Suitable habitat not present on or adjacent to the study area, and no evidence (e.g. dens) were observed. |
| <i>Myotis leibii</i> | Eastern Small-footed Myotis | END | END | G4 | S2S3 | - | - | MNRF | In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year. (MNRF 2015) | Possible: Potential maternity roosting sites (trees with cavities, loose bark, snags, and/or crevices) may be present within the study area. |
| <i>Myotis lucifugus</i> | Little Brown Myotis | END | END | G5 | S4 | Uncertain | - | MNRF | Overwintering habitat: Caves and mines that remain above freezing. Maternal roosts: Often associated with buildings (attics, barns, etc.). Occasionally found in trees (25-44 cm dbh). (MNRF 2015) | |
| <i>Myotis septentrionalis</i> | Northern Myotis | END | END | G4 | S3 | Uncertain | - | MNRF | Northern long-eared bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines. (MNRF 2015) | |

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| Scientific Name | Common Name | | | | | | | | | |
| <i>Perimyotis subflavus</i> | Tri-coloured Bat | END | END | G5 | S3? | - | - | MNRF | Overwintering habitat: Caves and mines that remain above freezing. Maternal roosts: Often associated with buildings (attics, barns, etc.). Occasionally found in trees (25-44 cm dbh). (MNRF 2015) | |
| <i>Microtus pinetorum</i> | Woodland Vole | SC | SC | G5 | S3? | Rare | - | MNRF | Generally associated with deciduous forests in areas of soft, friable, often sandy soil beneath deep humus, where it can burrow easily. | Not present: Preferred habitat not present within the study area. |
| MOLLUSC | | | | | | | | | | |
| <i>Liguma nasuta</i> | Eastern Pondmussel | END | END | G4 | S1 | - | - | MNRF | Typically found in sheltered areas of lakes and in slow-moving areas of rivers and canals with sand or mud bottoms. | Not present: Suitable habitat not present in study area. |
| <i>Taxolasma parvum</i> | Lilliput | END | THR | G5 | S1 | - | - | MNRF | Found in a variety of soft river bottoms, such as mud, sand, and silt. Lilliputs burrow in these soft materials to filter-feed. | Not present: Suitable habitat not present in study area. |
| <i>Villosa iris</i> | Rainbow Mussel | SC | THR | G5Q | S2S3 | - | - | MNRF | Prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms. It is found in or near riffle areas and along the edges of vegetation in water less than one metre deep. | Not present: Suitable habitat not present on site. |
| PLANTS | | | | | | | | | | |
| <i>Bacidia trachona</i> | A Lichen | - | - | G5 | S1S2 | - | 1978/6/26 | NHIC Database | Inhabits shaded and sheltered under hangs of calcareous or siliceous rock, on walls and in deep crevices at the base of trunks, on exposed roots of trees, near rivers at water level (Thompson, 1997). | Not Present: Suitable habitat is not present within the study area. |
| <i>Diplotomma epipolium</i> | A Lichen | - | - | GNR | S1S2 | - | 1978/6/28 | NHIC Database | Found on rock – calcareous, calciferous, basic (Consortium of North American Lichen Herbaria, 2017). | Not Present: Suitable habitat is not present within the study area. |
| <i>Castanea dentata</i> | American Chestnut | END | END | G4 | S2 | Uncommon | - | MNRF | Moist to well-drained forests on sand, occasionally heavy soils. | Not present: Species not identified during tree surveys, and the species has not been recorded in the Devil's Punchbowl Natural Escarpment natural area (Schwetz, 2014). |
| <i>Frasera caroliniensis</i> | American Columbo | END | END | G5 | S2 | Rare | - | MNRF | Most commonly associated with open deciduous forested slopes, thickets and clearings. | Possible: Suitable habitat is present within the study area. This species is not recorded within the Devil's Punchbowl Escarpment; however surveys were not conducted within the north corridor that the study area is within (Schwetz, 2014). |
| <i>Panax quinquefolius</i> | American Ginseng | END | END | G3G4 | S2 | Rare | - | MNRF | Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil. | Not present: Preferred habitat not present within study area. |

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| Scientific Name | Common Name | | | | | | | | | |
| <i>Phegopteris hexagonoptera</i> | Broad Beech Fern | SC | SC | G5 | S3 | Rare | - | MNRF | Shady areas of beech and maple forests where the soil is moist or wet. | Possible: Suitable habitat is present within the study area. This species is not recorded within the Devil's Punchbowl Escarpment; however surveys were not conducted within the north corridor that the study area is within (Schwetz, 2014). |
| <i>Juglans cinerea</i> | Butternut | END | END | G4 | S2? | - | 1991/8/12 | MNRF/ NHIC Database/ Hamilton NAI 2014 | Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows. MNRF considers Butternut habitat includes suitable lands within 50 m of a Butternut tree. | Possible: Suitable habitat is present within the study area. A tree inventory was conducted between May 28/29 2015 along the stream where major erosion is occurring, which did not identify any Butternut trees. The upper slopes of the valley were not surveyed, as no works are anticipated for this area. Therefore it is possible that butternut may be found in the lands adjacent to the study area. Additionally, the Hamilton NAI (2014) identifies butternut occurring within the Devil's Punchbowl Escarpment natural area. This section of the natural area was not surveyed during the Hamilton 2014 NAI, therefore the occurrence of butternut was not assessed within the study area, but may be present. |
| <i>Cornus florida</i> | Eastern Dogwood Flowering | END | END | G5 | S2? | Uncommon | - | MNRF/ Hamilton NAI 2014 | Generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments. Also grows around edges and hedgerows. | Possible: Suitable habitat is present within the study area. A tree inventory was conducted between May 28/29 2015 along the stream where major erosion is occurring which did not identify any eastern flowering dogwood. The upper slopes of the valley were not surveyed, as no works are anticipated for this area. Therefore it is possible that eastern flowering dogwood may be found in the lands adjacent to the study area. Additionally, the Hamilton NAI (2014) identifies eastern flowering dogwood as occurring within the Devil's Punchbowl Escarpment natural area. This section of the natural area was not surveyed during the Hamilton 2014 NAI, therefore the occurrence of eastern flowering dogwood was not assessed within the study area, but may be present. |
| <i>Trichophorum planifolium</i> | Few-flowered Clubrush | END | END | G4G5 | S1 | Rare | - | MNRF | Generally found in Dry Fresh Oak deciduous forests and Dry Fresh Oak-Maple-Hickory deciduous forests (only found on Royal Botanical Gardens property) (Schwetz, 2014). | Not present: In Hamilton, only known from Cootes Paradise. |
| <i>Arisaema dracontium</i> | Green Dragon | SC | SC | G5 | S3 | Rare | - | MNRF | Generally grows in damp deciduous forests and along streams . | Not Present: Suitable habitat is not present within the study area. This species prefers floodplains to steep ravines. |

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| Scientific Name | Common Name | | | | | | | | | |
| <i>Pycnanthemum incanum</i> | Hoary Mountain Mint | END | END | G5 | S1 | Rare | - | MNRF | Oak savannahs and prairies; dry sites. | Not present: Suitable habitat not present on site. Known from Hamilton Harbour. |
| <i>Hieracium paniculatum</i> | Panicled Hawkweed | - | - | G5 | S2? | Rare | 1956/8/08 | NHIC Database | Dry, open, sandy or rocky forests with oak (Michigan Flora Online, 2011). | Possible: Suitable habitat is present within the study area, and this species has been recorded previously in the Devil's Punch Bowl natural area. |
| <i>Morus rubra</i> | Red Mulberry | END | END | G5 | S2 | Rare | - | MNRF | Moist woods and wooded river valleys. (MNRF 2000). According to the MNRF, Category 1 habitat for the species is lands within 25 m of a tree. Category 2 habitat is suitable (e.g. forested) habitat between 25 and 125 m of a tree (MNRF 2013). | Possible: Suitable habitat is present within the study area. A tree inventory was conducted between May 28/29 2015 along the stream where major erosion is occurring, which did not identify any red mulberry. The upper slopes of the valley were not surveyed, as no works are anticipated for this area. Therefore it is possible that red mulberry may be found in the lands adjacent to the study area. |
| <i>Cares albicans</i> var. <i>albicans</i> | Sharp-scaled Oak Sedge | - | - | G5T5 | S3 | Rare | - | NAI 2014 | Dry, open sandy or rocky woods in southern Ontario. | Not Present: Suitable habitat is not present within the study area. |
| <i>Lithospermum parviflorum</i> | Soft-hairy False Gromwell | - | - | G4G5 T4 | S2 | Rare | - | NHIC Database | Woods, fields, thickets, alvars; often on floodplains. Mainly in southwestern Ontario, north to the Maitland River valley, but historically east to Hastings County (Belleville) (Natural Heritage Information Centre, 2015). | Not Present: Preferred habitat is not present within the study area. |
| <i>Chimaphila maculata</i> | Spotted Wintergreen | END | END | G5 | S1 | Rare | - | MNRF | Generally grow in sandy habitats in dry-mesic oak-pine woods. | Not present: Preferred habitat not present within study area. |
| <i>Eurybia divaricata</i> | White Wood Aster | THR | THR | G5 | S2 | Rare | - | MNRF | Generally grows in open, dry, deciduous forests. May benefit from some disturbance, as it often grows along trails. (MNRF 2000) | Not present: Preferred habitat not present within study area. |
| <i>Aureolaria flava</i> | Yellow False Foxglove | - | - | G5 | S2? | Rare | - | Hamilton NAI 2014 | Dry open woods and savannahs. | Not Present: Preferred habitat is not present within the study area. |

REPTILES

| Species | | COSEWIC Status | COSSARO Status | G-Rank | S-Rank | City of Hamilton | Observation Date | Source | Habitat Requirements* | Assessment of Species Occurrence in Study Area |
|------------------------------|-------------------------|----------------|----------------|--------|--------|------------------|------------------|--------|--|---|
| Scientific Name | Common Name | | | | | | | | | |
| <i>Emydoidea blandingii</i> | Blanding's Turtle | THR | THR | G4 | S3 | Rare | - | MNRF | Generally occur in freshwater lakes, permanent or temporary pools, slowflowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams. | Not present: Preferred habitat not present within study area. |
| <i>Heterodon platirhinos</i> | Eastern Hog-nosed Snake | THR | THR | G5 | S3 | - | - | MNRF | Sandy upland fields, pastures, savannahs, sandy beaches, dry open oak-pine-maple forest with sandy soils, prefer forest areas > 5 ha. | Not present - According to the Hamilton NAI, only known from area 2 miles south of Lynden (1983). One historic record near Lake Medad (1935). Preferred habitat not present within study area. |
| <i>Thamnophis sauritus</i> | Eastern Ribbonsnake | SC | SC | G5 | S3 | Rare | - | MNRF | COSWEIC (2002b, p. iv) defines ribbonsnake habitat as follows: "The Northern Ribbonsnake is semi-aquatic and most frequently found along wetland edges. Quiet, shallow water with low surrounding cover is preferred, although areas with good exposure to sunlight are also required. Gravid females may move away from water before nesting, as females and juveniles are occasionally found in upland areas." | Not Present: According to the Hamilton NAI, confirmed records in the last 20 years consist of sightings at Fletcher Creek Swamp Forest and at Cootes Paradise. |
| <i>Graptemys geographica</i> | Northern Map Turtle | SC | SC | G5 | S3 | Rare | - | MNRF | Large bodies of water with soft bottoms and aquatic vegetation, basks on logs or rocks or on beaches and grassy edges. Uses soft soil or clean dry sand for nest sites, may nest some distance from water. | Not present: According to the Hamilton NAI, confirmed records consist of sightings at Cootes Paradise, Hamilton Harbour, and one record from Glanford Station in 1989. Preferred habitat not present on site. |
| <i>Chelydra serpentina</i> | Snapping Turtle | SC | SC | G5 | S3 | Common | - | MNRF | Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravelly or sandy areas along streams. Snapping turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. | Not Present: Suitable habitat is not present within the study area. |
| <i>Apalone spinifera</i> | Spiny Softshell | END | THR | G5 | S3 | Rare | - | MNRF | Highly aquatic turtles that rarely travel far from water. They are found primarily in rivers and lakes but also in creeks and even ditches and ponds near rivers. Key habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species. | Not present: According to the 2014 Hamilton NAI, confirmed records only exist at Cootes Paradise and Hamilton Harbour. Potentially suitable habitat for this species is not present in the study area. |

| Species | | COSEWIC Status | COSSARO Status | G-Rank | S-Rank | City of Hamilton | Observation Date | Source | Habitat Requirements* | Assessment of Species Occurrence in Study Area |
|-----------------|-------------|----------------|----------------|--------|--------|------------------|------------------|--------|-----------------------|--|
| Scientific Name | Common Name | | | | | | | | | |

*Habitat requirements per MNRF 2016, unless noted otherwise.

Summary of SAR and other Species of Conservation Concern

Chimney Swift – Present/Confirmed

Status: Threatened (COSEWIC & COSSARO)

The Chimney Swift spends most of the day in flight feeding on insects, often near bodies of water due to the abundance of insects. According to COSEWIC,

Prior to the arrival of European settlers in North America, Chimney Swifts nested mainly in the trunks of large, hollow trees, and occasionally on cave walls or in rocky crevices. However, due to the land clearing associated with colonization, hollow trees became increasingly rare, which led Chimney Swifts to move into house chimneys (COSEWIC, 2007).

Chimney swifts are mainly associated with urban and rural areas where the birds can find chimneys to use as nesting and resting sites. However, it is likely that a small portion of the population continues to use hollow trees (COSEWIC, 2007). In the northern part of the breeding range, the Chimney Swift favour sites where the ambient temperature is relatively stable.

Correspondence with the MNRF states that this species is in the area of the proposed works. Preferred nesting habitat (chimneys) not present within the study area, however as this species is an aerial insectivore, potential foraging habitat exists above the stream valley. As a Threatened species, the chimney swift is protected under the Ontario Endangered Species Act (2007).

Eastern Wood-pewee – Possible

Status: Special Concern (COSEWIC & COSSARO)

The Eastern wood-pewee occurs throughout Southern Ontario, breeding most often in deciduous woods, and sometimes in more open habitats, with a preference for open habitats (such as open water, roadways, and clearings) adjacent to nesting sites (Peck and James, 1987). The MNRF (2016) further describes the habitat of Eastern wood-pewee as open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, and parks. In general, the size of forest fragments does not appear to be an important factor in habitat selection, though adjacent land uses (i.e. residential housing) are known to negatively impact the species (COSEWIC 2013). “More than most other eastern flycatcher species, the Eastern Wood-pewee uses dead branches as hunting perches, which may be an additional habitat need” (COSEWIC 2013).

Based on habitat conditions within the study area, this species may be present within the natural area adjacent to, or within the study area. As a species of Special Concern, this species is protected under the City of Hamilton’s Official Plan (OP).

Red-headed Woodpecker – Possible

Status: Threatened (COSEWIC), Special Concern (COSSARO)

The Red-headed Woodpecker is found in a wide variety of habitats, including open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks (COSEWIC, 2007). The open areas favoured by this species usually contain a high density of dead or unhealthy trees for roosting, and where holes can easily be made for nesting. In winter, the Red-headed Woodpecker occurs mainly in open, mature woodlands, such as oak stands, oak-hickory stands, maple stands, ash stands and beechwoods. The presence of this species in these various stands correlates with the abundance of acorns and beechnuts.

The tree inventory identified American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), and white oak (*Quercus alba*) in the study area. Therefore tree species within the study area, and the species' preferred habitat types leads to the possibility that this species could inhabit the natural area within and/or adjacent to the study area. As a provincial species of Special Concern, red-headed woodpeckers are protected under the City of Hamilton's OP.

Myotis bats – potentially present

Status: Endangered (COSEWIC & COSSARO)

According to COSEWIC, "Habitat for bats is composed of: 1) hibernacula for overwinter survival and 2) summering areas with suitable foraging areas within commuting range to structures used for roosting or maternity colonies. The habitat requirements of temperate-region bats vary by season. Maternity sites (trees, rock crevices, buildings, bat houses) and hibernacula (cave, mine, or building used for hibernation) are the main limiting habitat features for the three species within their range." (2013) Suitable hibernation sites (i.e. mines and caves) are not present within the study area. Potentially suitable maternity roosting habitat is present within the natural area. Targeted surveys for bats and bat maternity roosting habitat were not completed as part of this study. As such, further study is required to assess these areas' potential suitability as habitat for bats. As Endangered species', myotis bats are protected under the Ontario Endangered Species Act (2007).

American Columbo – Possible

Status: Endangered (COSEWIC & COSSARO)

American Columbo is most commonly associated with open deciduous forested slopes, thickets and clearings (COSEWIC, 2006). American Columbo grows in a variety of relatively stable habitats as well as on a wide variety of soils. In Ontario, American Columbo is frequently found growing with a rare plant, perfoliate bellwort, as well as with woodland sunflower, Pennsylvania sedge, poverty oat-grass and various asters and goldenrods (COSEWIC, 2006).

A botanical inventory was beyond the scope of this report, and the Hamilton NAI (2014) did not inventory the north corridor of the Devil's Punchbowl Escarpment natural area. Therefore the presence of herbaceous species within the study area is not known. As an Endangered species, American columbo is protected under the Ontario Endangered Species Act (2007).

Broad Beach Fern – Possible

Status: Special Concern (COSEWIC & COSSARO)

Broad beech fern inhabits shady areas of beech and maple forests where the soil is moist or wet. The tree inventory identified American beech and sugar maple (*Acer saccharum ssp. saccharum*) within the study area. Sugar maple comprises 50% of the species identified in the tree inventory and American beech comprises 7%. Given the species composition of the tree inventory, the moist soils attributed to the creek, and shade from mature trees, broad beach fern may occur within the study area.

A botanical inventory was beyond the scope of this report, and the Hamilton NAI (2014) did not inventory the north corridor of the Devil's Punchbowl Escarpment natural area. Therefore the presence of herbaceous species within the study area is not known. As a species of Special Concern, this species is protected under the City of Hamilton's OP.

Butternut – Possible

Status: Endangered (COSEWIC & COSSARO)

Butternut is a short-lived (<75 years), mast-bearing tree in the walnut family (Juglandaceae). It is frequently found along moist streambanks and within riparian areas, although it will also occur on well-drained sites underlain by limestone (Poisson and Ursic, 2013). As butternut is intolerant of shade it does not comprise a large component of mature forests. In Canada this species is restricted to southern Ontario and Quebec where the soils are calcareous, and is absent on the granites of the Canadian Shield. Like American chestnut and eastern flowering dogwood, the primary threat to butternut is an introduced exotic fungal pathogen, *Sirococcus clavignenti-uglandacearum* (“butternut canker”). Infection generally occurs through wounds, broken branches or leaf scars, causing twig dieback and eventual tree mortality. The most obvious sign of infection is a black, oozing canker on the stem or twigs. Potential habitat for butternut occurs throughout the subwatershed study area. The Butternut Recovery Strategy (Environment Canada, 2010) states the following:

Butternut can tolerate a large range of soil types. It typically grows best on rich, moist, well-drained loams often found along stream banks but can also be found on well-drained gravelly sites, especially of limestone origin. Butternut is intolerant of shade and competition, requiring sunlight from above to survive but it has the ability to maintain itself as a minor component of forests in later successional stages. As a result, the species is typically scattered throughout a stand and occasionally, groups of butternuts can be found along forest roads, forest edges or anywhere sunlight is adequate to support regeneration through seed.

Suitable habitat for this species is present throughout the area; however there were no documented occurrences within areas surveyed. Surveys completed by Aquafor Beech Limited did not cover all potentially suitable butternut habitats; individual Butternut could be present on the upper slopes of the ravine. Accordingly, additional surveys for Butternut at subsequent planning stages are recommended.

As an Endangered species, butternut is protected under the Ontario Endangered Species Act (2007).

Eastern Flowering Dogwood – Possible

Status: Endangered (COSEWIC & COSSARO)

Eastern flowering dogwood is a showy understory species in the dogwood family (*Cornaceae*). Its distribution in Ontario is restricted to the southwest (i.e. Carolinian Zone). It exists in a variety of mid-aged to mature forests, including open dry-mesic hickory woodlands, mesic maple-beech deciduous forest and mixed forest (Bickerton and Thompson-Black, 2010); and can also occur within hedgerows. It prefers coarser soils, in particular acidic sandy-loams.

Infection by an exotic fungus known as *Discula destructiva* (“dogwood anthracnose”) is the primary threat to this species. It tends to be most severe in shaded, moist areas, and it spreads primarily in cool, wet seasons. After infection, tan spots surrounded by a purple ring develop in the lower leaves. The infection then spreads further into the crown and may produce cankers along the stem.

Eastern flowering dogwood was not recorded during the tree inventory. However, not all potentially suitable habitats (e.g. upper slopes of the ravine) within the study area have been surveyed. Accordingly, additional surveys for eastern flowering dogwood at subsequent planning stages are recommended.

As an Endangered species in Ontario, eastern flowering dogwood is protected under the Ontario Endangered Species Act.

Panicled Hawkweed – Possible

Status: S2?

Panicled hawkweed prefers dry, open, sandy or rocky forests with oak. The species was previously recorded in the Hamilton NAI (2014), and potentially suitable habitat is within the study area. As a Provincially rare species (S2?) panicled hawkweed is protected under the City of Hamilton's OP.

A botanical inventory was beyond the scope of this report, and the Hamilton NAI (2014) did not inventory the north corridor of the Devil's Punchbowl Escarpment natural area. Therefore the presence of herbaceous species within the study area is not known.

Red Mulberry – Possible

Status: Endangered (COSEWIC & COSSARO)

The Red Mulberry is an understory forest tree species found in moist forest habitats. In Ontario, these include calcareous soils in Sugar Maple – Basswood – White Ash – Red Oak – Hackberry – Ironwood woodlands of the Niagara Escarpment, specifically in slopes and benches in the Niagara Escarpment where moisture levels remain high, in floodplain and river valleys (COSEWIC, 2015).

Hybridization with white mulberry (*Morus alba*) is likely to be the most significant threat to continued persistence of Red Mulberry in Canada (COSEWIC, 2015). Because white mulberry is more abundant than red mulberry and the two species freely intercross, most of the pollen rain that reaches female flowers of Red Mulberry is from hybrids or pure White Mulberry individuals. Historically, habitat loss and degradation in the Carolinian Zone of Canada was the biggest threat to this species.

Suitable habitat for this species is present in and adjacent to the study area; however there were no documented occurrences within areas surveyed. Surveys completed by Aquafor Beech Limited did not cover all potentially suitable red mulberry habitats; individual red mulberry could be present on the upper slopes of the ravine. Accordingly, additional surveys for red mulberry at subsequent planning stages are recommended.

As an Endangered species, red mulberry is protected under the Ontario Endangered Species Act (2007).