Colucent
Environmental

37 Bellevue Terrace
St. Catharines, ON, L2S 1P4 Canada
colucentenvironmental.com

September 22, 2024

Environmental Impact Summary Report

159 Confederation Street, Glen Williams ON

Prepared by:

Colucent Environmental Inc.
LGL Limited

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EXECUTIVE SUMMARY

This proposed development consists of 82 new single-family dwelling units, including 81 townhouse units and one single-detached unit. When developed, the 12.33 ha Subject Lands will include about 8.1 ha (or 66 %) developed lands and about 4.23 ha (or 34 %) of natural areas.

The development will occur principally in open and relatively level areas of the Subject Lands. Large portions of the area proposed for development are currently mown and managed by some local community residents as an informal golf course.

The natural and treed areas on the Subject Lands are mostly associated with former aggregate extraction operations. That extraction left areas of barren land, without topsoil or vegetation cover. Those lands are being slowly colonized by plant species that can tolerate the absence of topsoil and the infertile and drought prone soils. Open bare soil persists partly from the ongoing active use of some parts of the Subject Lands, by off-road vehicles.

The relatively short list of flora, and the higher proportion of non-native species reflect the disturbed nature of the Subject Lands. Disturbed areas are also infested with Garlic Mustard and Buckthorn. Two provincial Species at Risk (SAR) plants were recorded, Butternut and Black Ash. Regionally and locally rare were plants within the Subject Lands are Meadow Horsetail, White Spruce, Eastern Red Cedar, and Hairy Beard-tongue. No aquatic species at risk (SAR) were recorded on the Subject Lands.

This EIR recognizes and responds to the degree of disturbance on much of the Subject Lands. This report is guided by an approved Terms of Reference with some additional interpretations, to recognize the opportunity to accelerate substantial ecological restoration opportunities on these disturbed and degraded lands.

The forward-thinking conservation and restoration approaches presented in this EIR match with important actions on the global, national and provincial stages (e.g., Kunming-Montreal Global Biodiversity Framework, Ontario's Biodiversity Strategy 2023 – 2030, Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada).

More locally, on the Subject Lands, development avoids areas determined to provide the greatest degree of ecological functions (e.g., North Tributary and associated more intact woodland). Most of the disturbed vegetation communities will also be retained and subject to extensive, proactive ecological restoration measures.

The development includes substantial measures to restore areas of cultural woodland, thicket and meadow into more viable and resilient native woodland. This report reflects attention to development that, at its core, will result in more positive and accelerated approaches to natural heritage conservation and recovery. With that restoration, will come improved climate resiliency, enhanced biodiversity and increased species at risk habitat, sustainable in the long term.

1.0 INTRODUCTION

1.1 Summary of Project and Reporting

This project consists of a proposed development of 82 units, comprised of one single detached dwelling and 81, 25' Townhomes ranging in size from 2190 ft^2 to 2450 ft^2. This proposed Draft Plan of Subdivision, is a residential development in the Hamlet of Glen Williams. It will be accessed from an existing road off Confederation Drive. When developed, the 12.33 ha Subject Lands will include about 8.1 ha (or 66 %) developed lands and about 4.23 ha (or 34 %) of natural areas.

This Summary Environmental Implementation Report (EIR) is supported by a detailed technical Environmental Implementation Report - Existing Conditions, by LGL Limited (LGL)(2024). Colucent Environmental was retained to collaborate with LGL on the EIR and to help advance nature positive approaches that are well-suited to these historically disturbed lands. This Summary EIR presents salient information and the impact assessment analyses, with reference to extensive technical details in the appended LGL technical Environmental Implementation Report - Existing Conditions (EIR) (Appendix 3).

1.2 Terms of Reference

A Terms of Reference (ToR), (Appendix A, in LGL technical Environmental Implementation Report - Existing Conditions) was prepared in accordance with the policies of the Glen Williams Secondary Plan (2021). The ToR was approved by Halton Region, the Town of Halton Hills, and Credit Valley Conservation (CVC) in December 2021.

That ToR notes that, " The complexity of the EIR will be dependent on the environmental sensitivity of the Credit River, adjacent watercourses, and existing site conditions. As detailed work has continued under the approved ToR, the degree of disturbance on the Subject Lands has become better understood. Those characteristics and conditions have caused the EIR to broaden beyond certain traditional deliverables (e.g., Tree Preservation and Edge Management Plans), to develop a more holistic and comprehensive Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan.

That broader plan will benefit from substantial collaboration amongst the Town and conservation authority. A preliminary framework for that plan is included in Appendix 4 to this EIR, to serve as a working guide to those discussions. Practical knowledge gained from this advanced approach may be helpful to consider and apply elsewhere in and beyond the Town. We understand that Credit Valley Conservation has significant expertise in the implementation of advanced ecological restoration, and this project may move forward more effectively with a shared restoration implementation approach.

1.3 Landscape Context

Figure 1 (Appendix 1) illustrates the location of the Subject Lands in a larger landscape context. These lands are located in Glen Williams, on the northern margins of the Town of Georgetown which has a population exceeding 40,000 (42,123 in 2016). The Subject Lands occur below the Niagara Escarpment in an area of glacial till. Where undisturbed, the till has a reddish colour due to the shale of the Queenston Formation and is less calcareous than most of the tills in the south part of Southern Ontario.

The Subject Lands sit in an area of moraines with outwash sand and gravel terraces between them. Ground water levels adjust seasonally, but the measured water table on the Subject Lands varies between about 1.44 meters below ground surface (mbgs) to 8.43 mbgs. The shallow

unconfined aquifer groundwater flow direction was inferred to be in a north easterly direction towards Credit River (Sirati & Partners Consultants Ltd., 2024).

Remnants of outwash spillways with sand and gravel terraces occur along the Credit River valley beginning upstream about 10 miles from the Subject Lands (Chapman and Putnam 1984). Those sand and gravel terraces have been the subject of the recent historic extraction of aggregate resources, pre-dating the regulation of those activities in Ontario. The extent of extraction at that time followed those terraces for several kilometers upstream of the Subject Lands along the Credit River.

Similar and larger extraction activities were occurring on and adjacent to the Subject Lands, through a two kilometer stretch along the west side of the Credit River. These aggregate extraction areas left the land barren, without topsoil or vegetation cover. Much of the established Bishop Court subdivision occurs on those formerly extracted lands. The following screenshot (from 1965 aerial photography) illustrates the extent of that local extraction (Subject Lands outlined in red).

Figure 2 (Appendix 1) more closely illustrates the extent of extraction on the Subject Lands in 1965. The proposed plan has been imposed on that snapshot of extraction activities to inform the impact assessment and ecological restoration planning work summarized in this report. This EIR recognizes and responds to the degree of disturbance on much of the Subject Lands.

1.4 Subject Lands

The Subject Lands are located at 159 Confederation Street in the Hamlet of Glen Williams (Town of Halton Hills). The property is vacant and ranges between approximately 100 m to 150 m from the Credit River. The property has a total lot area of approximately 12.33 ha. Land uses currently within the vicinity of the property consist of a mix of rural/agricultural areas, open spaces, and dispersed single-detached housing of relatively low density.

On the Subject Lands, the vegetated areas are mostly associated with former aggregate extraction operations. No details are available regarding any licenses issued to that operation and it is likely that extracted areas operated informally as wayside pits, and were then abandoned without rehabilitation planning, required under today's standards. The character of most of the vegetated areas on the Subject Lands substantiates this history of disturbance.

Over a period of decades, most of the formerly extracted lands remain relatively open with large areas of barren soils. They are being slowly colonized by plant species that can tolerate the absence of topsoil and the infertile and drought prone soils. Open bare soil persists partly from the active use of some parts of the Subject Lands by off-road vehicles.

The absence of requirements for progressive rehabilitation on historic extraction operations, supressed the full recovery of a natural forest system, dominated by a diversity of native tree species and associated intact native understory and ground cover. Those small pockets of vegetation that have become slowly established on the Subject Lands are dominated by Trembling Aspen (*Populus tremuloides*) and by Manitoba Maple. (*Acer negundo*) (**Photos 5**, **8**, Appendix 2). Both species adapt to and establish in early stages of succession, including colonizing disturbed lands. The Subject Lands have not been the subject of ecological restoration or good forestry practices.

Trembling aspen is a native tree species that is often a pioneer in disturbed habitats. This species is relatively short-lived, sometimes beginning to decline at about 60 years. Manitoba Maple is native to southwestern Ontario watersheds, although it has expanded its former range and is now widespread in southern Ontario. Manitoba Maple can colonize disturbed lands and is considered an invasive species across much of its range. This species is short-lived, attaining an average age of 60 years. Ice and wind damage is common, and this species is susceptible to mechanical damage due to its thin bark. Larger trunks are prone to collapse, and new, upright stems can emerge from the fallen trunk (**Photo 6**, Appendix 2).

While subject to detailed tree surveys and dripline surveys (Appendix 3), given closer, more current assessments of all aspects of the treed areas (e.g., soil structure, moisture content, topsoil presence/absence, degree of aggressive and/or invasive species), portions of what was previously defined as woodland, do not meet accepted standards for delineation or retention. Regardless, most of the treed area, including former aggregate extraction areas, will not be developed. Instead, most of the disturbed vegetated areas, will be subject to progressive and active ecological restoration, to create a woodland that will become more sustainable, resilient, and significant over time.

Evidence of disturbance is widespread throughout the cultural communities on the Subject Lands. Open meadows are being used for golfing on a makeshift, mown course (**Photos 18**, **19**, Appendix 2). Informal trails occur across the southern and western portions of the Subject Lands. Disturbance associated with encroachment from neighbouring properties along the southern boundary of the Subject Lands has resulted in some tree and shrub removals, expanded mowing into cultural vegetation communities (**Photo 7**, Appendix 2), dumping of garden debris with active rat burrows (**Photo 9**, Appendix 2), and the escape and expansion of ornamental plants species which are displacing native plants (e.g., Periwinkle, Tatarian Honeysuckle, Goutweed). Disturbed areas are also infested with Garlic Mustard and Buckthorn (**Photo 11**, Appendix 2).

2.0 TECHNICAL INVESTIGATIONS

2.1 Natural Heritage Features and Functions

Ecological field investigations were undertaken by LGL commencing in April 2019 through to September 2021 and in the summer of 2023. Confirmatory and current surveys were completed by LGL and Colucent in May and June 2024. More specifically, field investigations on the Subject Lands were completed on May 5 and 8, and June 4, 2024.

These field surveys followed standard and best practices and generated a comprehensive understanding of the aquatic and terrestrial ecology conditions and the relationships amongst groundwater, surface water and ecology. Methods are described more fully in the LGL technical Environmental Implementation Report - Existing Conditions (Appendix 3).

2.2 Aquatic Ecology

Aquatic investigations were completed by LGL in March, April and October, 2019 and in March and July, 2020. Current conditions were observed in 2024 by LGL and Colucent.

Work to-date has confirmed that the potential for fish and fish habitat within the study area is limited to two tributaries to the Credit River. The Credit River is the receiving waterbody for both of the tributaries and is managed as a mixed cold/coolwater fish community (per the Credit River Fisheries Management Plan (CRFMP). The two tributaries (North and South) are briefly described in the following. More details and supporting data are provided in the LGL technical Environmental Implementation Report - Existing Conditions (Appendix 3).

North Tributary

The North Tributary consists of direct warm/coolwater forage (baitfish) fish habitat, and is managed for a small warmwater fish community (per the CRFMP). The fish observed (Blacknose Dace and Creek Chub) are tolerant, warmwater forage species.

The tributary located in the north section of the study area is a perennially flowing, well defined channel within a deeply incised valley (**Photo 4**, Appendix 2). Portions of the valley and surrounding uplands are relatively intact, mixed woodland. **Figure** 2 (Appendix 1) illustrates the disturbance origins of some of the upstream portions of the woods. The channel generally proceeds in a southeasterly direction in the northern area of the Subject Lands, before proceeding easterly towards its confluence with the Credit River.

Several areas of treefall and woody debris jams were observed during the investigation periods resulting from moderate to severe bank erosion, and erodible soils. Flows appear to fluctuate based on surface runoff, although there may be contributions from groundwater based on the observation of a minor seepage area within the Subject Lands.

This stream supports a warmwater to coolwater thermal regime for fish. A combination of groundwater inputs via bank seepage, and potential upwelling into the streambed along with a high amount of canopy cover and associated shading contributes to the moderation of stream temperatures in this tributary.

South Tributary

The South Tributary is described by LGL in terms of three reach segments (section 3.2 in Appendix 3, LGL report). The South Tributary does not have a thermal regime due to the lack of channel form and ephemeral flows (**Photo 10**, Appendix 2). The indirect function of this tributary

is primarily for contributions of sediment, nutrients and other inputs. The CRFMP has identified this tributary as being managed for a small warmwater fish community.

2.3 Terrestrial Ecology

Eight Ecological Land Classification (ELC) vegetation community types occur within the Subject Lands. All of the vegetation communities are considered widespread and common in Ontario and are secure globally. Vegetation communities consist of a mixture of natural forest and cultural communities. The more natural forest, which provides environmental benefits to the general public (e.g., erosion prevention, hydrological and nutrient cycling, the long-term storage of carbon, and provision of wildlife habitat) occurs along the North Tributary valley and along the northern property limits, generally coincident with a defined top of bank slope and its associated buffer (**Photos 1**, **2**, Appendix 2).

Cultural woodland, thicket and meadow vegetation communities dominate the Subject Lands and support a high diversity of non-native plant species. The cultural woodland which does not meet the conventional description of woodland (per the PPS) is largely comprised of Manitoba maple (*Acer negundo*), poplar species (*Populus* spp.) and ash species (*Fraxinus americana* and *F. pennsylvanica*) with occasional elm (*Ulmus* spp.).

The understory of this portion of the woodland is dominated by Manitoba Maple and Common Buckthorn (*Rhamnus catharica*), while the ground layer is dominated by non-native plant species. A high proportion of the trees are in decline showing various signs of stress and crown dieback. Emerald Ash Borer is widespread throughout the ash trees resulting in the decline of the trees. Several of the poplar trees are displaying signs of hypoxylon canker. Evidence of regeneration is limited in the cultural woodland.

There are several areas that are not identified as ELC vegetation communities including manicured areas (M) which include mown lawns, gardens and planted trees.

A total of 161 plant species have been recorded within the Subject Lands. Of those plants 89 (56%) plant species identified are native to Ontario and 70 (44%) plant species are considered introduced and non-native to Ontario. The relatively short list of plants recorded during detailed surveys, and the higher proportion of non-native species, reflects the disturbed nature of the Subject Lands.

Within the cultural woodland on the west side of the property are small inclusions of swamp thicket (SWT) habitat. The wetland inclusions, likely resulting from aggregate extraction closer to ground water, are dominated by red-osier dogwood (*Cornus sericea* ssp. *sericea*) and willow species (*Salix* spp.) within low elevation areas (**Photo 12**, Appendix 2).

Based on both years of anuran (frogs and toads) call data and observations of site conditions associated with the wetlands (i.e., the absence of standing, open water for any duration) these habitats provide only limited functions for two breeding species, Spring Peeper and American Toad. Only a single Spring Peeper individual was heard calling in both 2019 and in 2020, and only a single American Toad was heard calling in 2020. No suitable salamander habitat was identified within the Subject Lands. No salamanders or Jefferson Salamanders were detected during LGL's surveys.

In terms of reptiles a single Eastern Garter Snake (*Thamnophis sirtalis sirtalis*) was observed in 2019. Additional snake species may be expected to use habitats within the study area. No observations of turtle species were made during surveys. Use of the study area by turtle species is limited, due to the lack of suitable habitat.

Field observations identified 32 species of wildlife on the Subject Lands. The majority of identified wildlife were bird species. Most bird species were located within cultural woodland/meadow

communities, with a moderate number of species identified within forested habitats along the northern portion of the property, below the top of slope.

Several Barn Swallow were observed foraging during breeding bird surveys; however, no nests of this species were identified on the Subject Lands. Three bird species that are considered area-sensitive and/or interior species according to the Significant Wildlife Habitat Technical Guide (MNRF, 2000) were observed on the Subject Lands; Savannah Sparrow (*Passerculus sanwichensis*), White-breasted Nuthatch, and Red-eyed Vireo (*Vireo olivaceus*).

White-breasted Nuthatch and Red-eyed Vireo were identified within the more intact forested habitat associated with the North Tributary and the Credit River, north of the Subject Lands (i.e., not cultural woodlands). Savannah Sparrow inhabits most grassy areas and some farm fields (e.g., alfalfa fields, pastures). This species is one of the most widespread in North America.

None of the five observed mammal species observed on the Subject Lands are at risk federally or provincially. The mammal species documented represent an assemblage that readily uses human influenced landscapes.

Cultural meadow and manicured habitat types were found across much of the eastern portions of the Subject Lands and were found to contain a low diversity of wildlife.

On the local landscape scale, the natural heritage features associated with the intact woodlands likely provide only local wildlife movement opportunities and functions, mostly associated with the Credit River and adjacent intact natural areas. Wildlife species identified within the Subject Lands are commonly associated with human-affected features and disturbed habitat.

2.4 Species at Risk

No aquatic species at risk (SAR) were recorded for the Subject Lands. Two provincial SAR plants were recorded, Butternut and Black Ash. Ninety-three individual butternut trees were recorded, measured and assessed. Overall, butternut trees ranged in size from 1 cm to 32 cm diameter at breast height (DBH), and they are in varying states of health. A Butternut Health Assessment (BHA) was undertaken in August 2023 and submitted to MECP for review. The majority of Butternut trees and both of the two Black Ash trees will be protected within the proposed restored natural areas.

Four plant species considered regionally rare and the following four plant species considered locally rare were identified within the Subject Lands; Meadow Horsetail, White Spruce, Eastern Red Cedar, and Hairy Beard-tongue.

Regional and local plant species status depended upon an historic reference, titled: The Vascular Plant Flora of the Region of Peel and the Credit River Watershed (Kaiser 2001). Given that document is now almost 25 years old, it is unlikely to represent a current understanding of the status of plant species. All four species appear to be associated with the disturbance areas (former aggregate extraction lands), and populations of each will be expanded in conservation and restoration planning on the Subject Lands.

In terms of bat species at risk, the snag/cavity tree assessment survey suggested that several suitable trees which could provide habitat within the cultural woodland community. Surveys have suggested that suitable bat roosting habitat within the study area is very limited and is generally isolated to the CUW1 habitat, the majority of which will be conserved and enhanced.

3.0 DEVELOPMENT CONSTRAINTS AND OPPORTUNITIES

3.1 Constraints

The altered landscape limits natural heritage features and functions that meet with the natural heritage policies of municipal and provincial plans (e.g., Halton Region OP, Town of Halton Hills OP and the Provincial Policy Statement).

The natural and more intact woodlands associated with Tributary 1, and the northern edges of the Subject Lands meet standard definitions of woodland. The areas of cultural woodland, without natural native soils and with the predominance of short-lived tree species and non-native plants, do not meet standard and accepted definitions of woodland.

These cultural treed areas are the relicts of early vegetation succession on lands that lack intact native soils to encourage the restoration of viable native woodland conditions. The functional importance has been suppressed by the limited physical conditions (i.e., from former aggregate extraction) which have led to slowed vegetation growth and the ongoing presence of bare soil areas, without any vegetation growth. Forest insects and diseases have magnified negative effects which have favored the colonization and persistence of non-native plant species.

Wetland areas are small, isolated and associated with former aggregate extraction. In those small depressions, the extraction of sand and/or gravel from the glacial terraces and the compaction of bare sands in, has created opportunities for plants favoring damp soils to begin to establish. Those small areas with wetland characteristics do not meet standard thresholds for evaluation, or the determination of significance (per the current Ontario Wetland Evaluation System (MNRF 2022). They have, however, been field staked with and agreed to by agencies and are conserved with greater than a 10 m buffer.

Previous staking exercises for woodland driplines need to be adjusted to recognize the importance of the more intact woodlands on the Subject Lands (i.e., natural woodlands associated with Tributary 1 and the northern edges of the Subject Lands). As directed natural and accelerated ecological restoration advances, the woodland will become more viable and functional, with forest soils, vegetation and associated habitat characteristics.

The features that do present current constraints to development are the Top of Bank and Fish Habitat. The Top of Bank is illustrated on Figure 3 in the LGL technical Environmental Implementation Report - Existing Conditions (Appendix 3). Referred to as the Staked Top of Slope on that Figure, it was staked and agreed to be Credit Valley Conservation Authority on June 10, 2014. That limit is generally coincident with the more intact forest cover, discussed in section 2.3 of this report.

3.2 Opportunities

The lands to remain as natural areas in the proposed development, provide important opportunities for progressive ecological restoration to improve natural heritage features and functions.

A conceptual restoration plan is attached for discussion, refinement and implementation (**Figure 4**, Appendix 1). This will be pursued further in a comprehensive Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan, led by an integrated team of experts from Landscape Planning Limited, LGL and Colucent. This plan will be advanced in close collaboration with the Town and Credit Valley Conservation. The benefits of completing this work collaboratively include ensuring commonalities with the Town's Natural Assets initiatives and with Credit Valley Conservation's Biodiversity Conservation and Natural Heritage programs. The Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan will incorporate traditional requirements into a more holistic ecosystem-based approach to conserve and restore natural

areas. It will incorporate and move well beyond basic, required elements (e.g., Tree Inventory and Preservation Plan, Edge Management Plan). A draft Table of Contents of that report is included in Appendix 4, to illustrate where collaborative discussions will contribute to a final plan and its effective implementation.

This Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan will focus on actions including:

- Conserving and enhancing the existing, relatively intact woodland through the selective removal of invasive shrubs including Tatarian Honeysuckle and Common Buckthorn;

- Selectively harvesting and propagating native groundcover from Zone 1 to accelerate the establishment of these species in buffers to Zone 1, under temporary shade structures if/as necessary;

- Monitoring natural seed rain into buffers to Zone 1, to determine additional measures (if any) to increase germination success;

- Redirect the successional path away from the perpetuation of short-lived tree species, towards an accelerated path to the establishment of an intact, diverse deciduous woodland in Zones 2 and 3;

- Selectively remove Manitoba Maple and diseased Trembling Aspen, in stages broadly through Zone 2, with underplanting of native, more drought resilient tree species;

- Remove invasive shrubs and ground flora that are dominating portions of Zone 2 (e.g., Common Buckthorn, Tatarian Honeysuckle, Garlic Mustard, Goutweed); and

- Deploy specialized methods to accelerate the development of native topsoil and restore and enhance Zone 3 (e.g., with soil inoculants, native mulches, annual nitrogen fixing cover crops, shallow and localized tillage, installation of low natural barriers and grades to limit the erosion of re-developing soils.

These measures will redirect the successional path away from the perpetuation of short-lived, unstable tree species towards an accelerated path to the establishment of a resilient, diverse deciduous woodland suited to the ecological setting of the Subject Lands. The technical methods to restore and enhance the natural heritage features will support viable and sustainable natural woodlands.

4.0 PROPOSED DEVELOPMENT

4.1 Description of the Development

This development consists of 82 new single-family dwelling units, including consisting of 81 townhouse units and one single-detached unit, The development will occur principally in open and relatively level areas of the Subject Lands. Large portions of the area proposed for development are currently mown and managed by some local community residents to serve as an informal golf course.

The lands slope away at the western edges of the proposed development. Although the internal slopes on these lands are created, as result of former aggregate extraction, the development will generally work with those slopes and grades. Retaining walls varying in height from 0.2 m to 1.2 m will be installed adjacent to the western limits of the development (portions of Blocks 13, 14, and Road C).

In terms of transportation aspects of the development, this proposal introduces a relatively small number of trips to the road network, which experiences no operational issues under existing conditions. Therefore, the proposed development is expected to have a negligible impact and can be adequately accommodated by the surrounding transportation infrastructure (NEXTRANS Consulting Engineers, 2024).

The Functional Servicing Report and associated drawings (Condeland Consulting Engineers and Project Managers, 2024) provide substantial detail regarding the servicing of the Subject Lands.

Key points from that report that inform the impact assessment aspect of this report, include:

- A separate internal storm sewer will be created to divert the external drainage through Subject lands the proposed driveways, building rooftops, visitor parking spaces, and landscaped areas

- An open-bottom underground chamber (Greenstorm) SWM storage system will be installed under the park area to provide stormwater treatment

- That underground chamber with be underlain by an infiltration gallery underneath (> 1 m from the groundwater level) to provide additional quality control measures for the site

- A gravity sanitary sewer system will service all 82 residential units of the development

Condeland Consulting Engineers and Project Managers have confirmed that adequate storm drainage and stormwater management facilities, both quantitative and qualitative can be provided within the development area to neutralize the impact of urbanized runoff. They further conclude that the treatment train approach (OGS and Infiltration gallery) implemented for the Subject Lands will meet the required Enhanced Level I protection (min. 80% TSS removal).

5.0 IMPACT ASSESSMENT

This EIA has considered different types of predicted effects (e.g., direct, indirect) and various mitigation measures that are available and proven to address predicted impacts. The mitigation hierarchy includes the following standard steps:

- Avoidance
- Minimization
- Restoration/enhancement
- Offsetting

Avoidance is the first mitigation measure generally considered. In some cases, avoidance can be achieved through project and design modifications. Avoidance was applied in 2021 when the proposed plan of subdivision was updated from an earlier version that was previously provided to agencies for review. This revised development plan minimized impacts to the cultural woodland within the western half of the Subject Lands where development is no longer proposed. Disturbance to the more intact deciduous forest, mixed forest and natural heritage features associated with the Credit River will be avoided by implementation of a set-back from these features.

Figure 3 (Appendix 1) illustrates the complete avoidance of intact deciduous forests along the western portions of the Subject Lands. In those areas, the limit of development ranges from about 50 m to 200 m from the intact deciduous forest. The development intrudes into some areas of disturbed cultural woodland, thicket and meadow that will be subject to habitat creation, restoration and enhancement.

Additional measures to minimize predicted effects are summarized in the following.

Grading that will be required to accommodate for the proposed plan of subdivision will match existing grades at the rear lot lines will be managed, in some places using low sections of retaining walls. The most proximate woodland edge to development occurs along portions of the northern and eastern limits of the Subject Lands. Existing housing in those areas (e.g., along Bennett Place, Tweedle Street) already limit the width and functionality of the existing treed areas.

Impacts to the downstream receiving waterbodies are addressed by Condeland Consulting Engineers and Project Managers (2024). The servicing design drawings (sheet 10 of 12) provides details regarding the erosion and sediment control program. The following information relates principally to ecological aspects of the development.

During development and restoration of disturbed lands, clearing or disruption of vegetation where birds may be nesting should be completed outside the window of April 1 to August 31 to avoid the breeding bird season for most of the bird species protected under the act. If these activities must be undertaken from April 1 to August 31, a nest screening survey will be conducted by a qualified avian biologist. If an active nest is located, a mitigation plan shall be developed and provided to Environment Canada – Ontario Region for review prior to implementation.

Restoration will be used to enhance conditions in retained natural features (e.g., removal of invasive species). Predicted impacts are summarized in the following along aspects of mitigation, organized by the stage of development: pre-construction, construction and post-construction.

5.1 Predicted Impacts

Impacts from the proposed development will largely occur within habitat types that consist of disturbed/previously modified wildlife habitat (i.e., cultural meadow and cultural woodland communities, roughly managed informal golf course lands). These natural and cultural vegetation communities are not complex and are characterized by the presence of non-native plant species.

The development will prevent the ongoing use of the former aggregate extraction site by off-road vehicles, that perpetuate the soil disturbance and facilitate the prevalence of nonnative plant species. The restoration of the cultural and disturbed vegetation communities to establish important increases in biodiversity and nature positive outcomes both in terms of environmental conditions and in terms of human interactions with nature.

The top of bank will be protected with a buffer ranging from about 10 m to in excess of 50 m (about 10 m at the narrowest point). The more intact native woodland will also be conserved with a more substantial buffer and will be enhanced through the ongoing and selected removal of aggressive native and non-native species.

No direct impacts to fish or fish habitat are expected to result from the proposed development. However, there will be a loss of portions of the South Tributary. These removals will result in a negligible loss of aquatic habitat and function to the downstream receiving waterbodies. The surface water features will be enhanced through the removal of localized barriers, erosion control plantings and the restoration of native species and vegetation communities.

Given the presence of suitable bat snags within the property, selective tree removal from within the woodland will be conducted outside of the roosting maternity window to ensure no potential bat habitat is negatively impacted during that time.

5.2 Mitigation Measures by Development Stage

More detailed and prescriptive mitigation is provided according to the development stages. These should be read in conjunction with servicing design drawings (e.g., sheet 10 of 12) (Condeland Consulting Engineers and Project Managers, 2024)

Some of the pre-construction measures would be helpful to advance in the near term, during the development approvals process to optimize outcomes.

Pre-construction Period

- Ensure all environmental permits are coordinated and obtained in advance of construction.

- If required (e.g., bat species at risk), ensure overall benefit permit activities are well understood and appropriately planned for e.g., Endangered Species Act Permit(s), if/as necessary.

- After the development footprint is endorsed by the Town, collaboratively develop an Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan for lands to be conserved, restored, and protected in a post development setting.

- Woodland edge pre-stressing planning and implementation (i.e., selective edge thinning, before construction).

- Pre-development mitigation implementation (e.g., monitoring equipment installation, protective hoarding, sediment, and erosion control).

- Schedule construction activities during appropriate seasons, within watercourse areas.

- Complete detailed buffer and woodland restoration planning and design (within the Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan).

- Complete detailed tributary enhancement planning and design within the Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan.

- Integrate a localized Tree Saving Plan (extended to include understory and groundcover targets) within the Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan)

Construction Period

- Complete construction during scheduled windows (with environmental oversight as determined in the Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan).

- Implement soil restoration program during invasive plant removals and management.

- Create planned habitat (e.g., restored woodland, buffers, some tributary enhancements).

- Establish specialized habitat features (e.g., per Ecological Rewilding, Adaptive Management and Monitoring Plan such as roosting, nesting, hibernacula, breeding pools, rocket box style bat roosts).

- Restore and enhance disturbed and degraded habitat (e.g., invasives removal and native species under-planting).

- Install climate change adaptation measures (per Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan), such as: installation of deeper, screened open water amphibian breeding/refuge pools, use of climate change resilient species in buffers and restoration/enhancement plantings, etc.

- Monitor and adjust pre-stressed treed areas if/as necessary.

- Install signage and interpretive information if/as determined by the Ecological Rewilding, Adaptive Management and Monitoring Plan.

Post Construction Period

- Install development limit fencing if/as required to help manage the interface between development and nature.

- Develop and disseminate nature information that will benefit citizens in the broader local community.

- Conduct periodic monitoring to define additional/restorative actions and habitat creation enhancements, defined in the Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan.

5.3 Net Effects

Having completed an assessment of potential impacts and related mitigation measures, the following are expected to be the net effects of the proposed development plan:

- No net negative effects on Fish Habitat in the Credit River;

- Enhancements to fish habitat due to potential improvements in fish passage potential;

- Conservation and enhancement of all intact native woodland;

- Replacement of disturbance origin treed areas on former aggregate extraction lands, with the development of a viable and sustainable native woodland;

- Conservation and enhancement of all (two) small, isolated wetland areas, that resulted from former aggregate extraction;

- The restoration and creation of habitat will result in a more diverse and resilient natural area;

- Intentionally designed and implemented, increases in native plant biodiversity (estimated 25% increase in species diversity), with a focus on species considered resilient to periodic and extended drought conditions;

- The increased plant species diversity and wetland enhancements will increase the diversity and abundance of reptiles and amphibians and will include measures to control the existing Norway Rat population;

- Conservation and enhancement of four populations of plant species at risk, with the additional expansion of native species from woods into the restoring buffers (e.g., Zig-zag Goldenrod, Wild Ginger, Virginia Waterleaf);

- Enhancement of bat habitat (e.g., bat rockets, artificial bark) as a head-starting measure during the forest creation and enhancement stage; and

- Conservation and enhancement of Butternut and Black Ash in association with the Forest Gene Conservation Association (FGCA).

Given the local, urbanizing landscape, many wildlife species are already acclimatized to existing human influence. Potential disturbance caused by light and noise from road use and housing can be mitigated by using downward directing lighting and by installing local landscape features to attenuate impacts. Disturbances to wildlife from noise, light and visual intrusion is not expected

to have measurable negative effects. The use of protective buffers, and informative signage will contribute to fostering good stewardship practices amongst the growing community.

5.4 Adaptive Management and Monitoring

Attachment 3, the technical Environmental Implementation Report - Existing Conditions Report, by LGL (2024) provides detailed measures related to:

- Short term (construction monitoring);
- Aquatic habitat monitoring;
- Environmental protection and erosion and sedimentation control measures; and
- Wildlife handling.

In addition to the important monitoring prescribed in Appendix 3, that work will be incorporated within an umbrella document, the Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan. This plan moves beyond traditional activities and incorporates important actions that will enhance the viability and resilience of the natural heritage features on and connected with the Subject Lands.

This plan will integrate measures and will ensure that there is an ability for minor adaptations over time including responses to shifting climate effects. Examples of key aspects of that plan are:

- Establishment of small permanent pools in the restored wetland features to secure the viability of and increase populations of amphibians and reptiles;

- Ensure the measurable improvement in soil productivity to support the long-term viability for the created/restored woodland; and

- Ongoing assessment and influence of community interactions with nature that will minimize impacts on nature while optimizing positive wellness outcomes associated with living in proximity to nature.

The Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan will ensure ongoing compliance with regulatory aspects while enhancing positive outcomes for nature and for community members.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed residential development occurs in an area that have been subject to historic and ongoing disturbances. Given the condition of this landscape and the opportunities for substantial improvements in nature, this Environmental Implementation Report (EIR) has been prepared, in part, to accelerate positive environmental outcomes.

A number of changes have occurred since the development of the standard Terms of Reference (Appendix A in the LGL technical Environmental Implementation Report - Existing Conditions Report). This EIR has been prepared with the backdrop of some urgency in responding to the twin climate change and biodiversity crises, and at a moment when municipalities, the provincial and federal governments are collectively working to accelerate the creation of more housing.

The forward-thinking conservation and restoration approaches presented in this EIR match with important ambitious actions on the global, national and provincial stages.

In 2022, Canada, along with 195 other countries, adopted the Kunming-Montreal Global Biodiversity Framework at the 15th Conference of the Parties (COP15) to the United Nations Convention on Biological Diversity (CBD). In 2023, the Ontario Biodiversity Council released Ontario's Biodiversity Strategy 2023 – 2030. That report calls for the achievement of substantial targets by 2025 and by 2030. The federal government has released "Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada". These ongoing processes have instilled a sense of urgency in conserving and enhancing biodiversity.

More locally, on the Subject Lands, development avoids areas determined to provide the greatest degree of ecological functions (e.g., North Tributary and associated more intact woodland). Most of the disturbed vegetation communities will also be retained and subject to extensive progressive ecological restoration measures.

The development includes substantial measures to restore areas of cultural woodland, thicket and meadow into viable and resilient native woodland. Those features are degraded and have been advancing slowly naturally, given the absence of native topsoil and the presence of aggressive short-lived tree species and an abundance of non-native species.

This report reflects an interest in, and attention to meaningful and accelerated development that, at its core, will result in more positive and accelerated approaches to natural heritage conservation and recovery. improved climate resiliency and enhanced biodiversity and species at risk habitat, for the long term.

Report Prepared by:
COLUCENT ENVIRONMENTAL INC.

Tom Hilditch
President

In association with:
LGL Limited, Environmental Research Associates

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8.0 APPENDICES

1. Figures
2. Photolog
3. Environmental Implementation Report - Existing Conditions, LGL Limited, July 2024
4. Draft Table of Contents, Ecological Restoration/Rewilding, Adaptive Management and Monitoring Plan

Attachment 1:

Figures

- Subject Lands
- Waterbody
- Watercourse
- Woodland

Landscape Setting and Subject Lands

Environmental Impact Summary Report
159 Confederations Street, Glen Williams, ON
Eden Oak (Bayfield) Inc.

Prepared by: Colucent Environmental

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Figure 1

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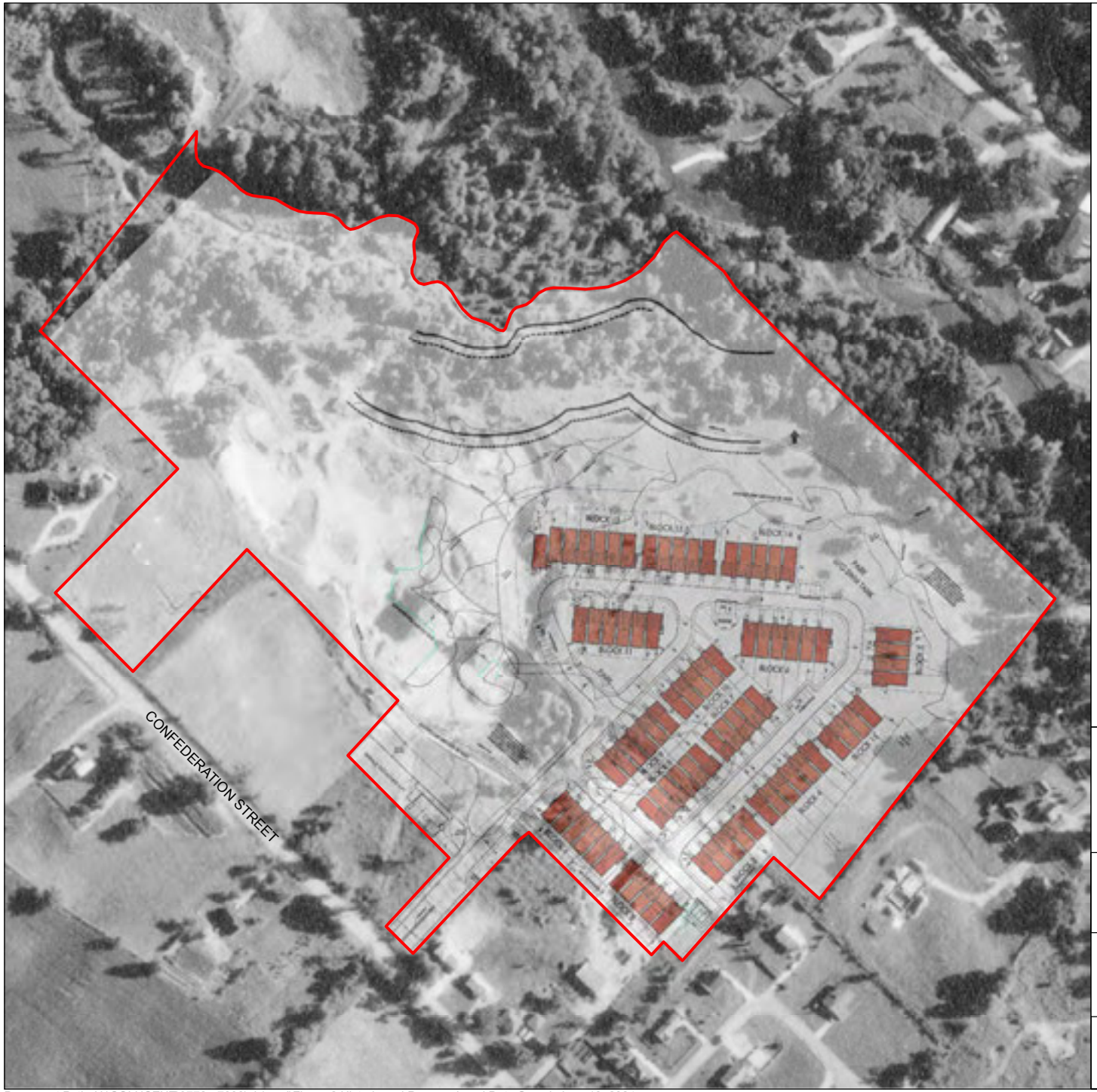

Subject Lands

Historic Aggregate Extraction Footprint and Proposed Development Plan

Environmental Impact Summary Report
159 Confederations Street, Glen Williams, ON
Eden Oak (Bayfield) Inc.

Prepared by: Colucent Environmental

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Figure 2

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Contains information licensed under the Open Government Licence – Ontario. Produced under Licence with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 20** [insert year of publication of EIP]. Base map data from Ontario Ministry of Natural Resources, Ontario GeoHub Land Information Ontario (LIO) Warehouse Open Data Products. https://geohub.lio.gov. on.ca Concept Plan 3 2023-09-25: 23020-SP100(Feb-13-24) ELC: LGL, 2024. Coordinate system: NAD 1983, UTM Zone 17T

Subject Lands

Vegetation Community Boundary

Current Ecological Setting
Proposed Development Plan

Environmental Impact Summary Report
159 Confederations Street, Glen Williams, ON
Eden Oak (Bayfield) Inc.

Prepared by: Colucent Environmental

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Figure 3

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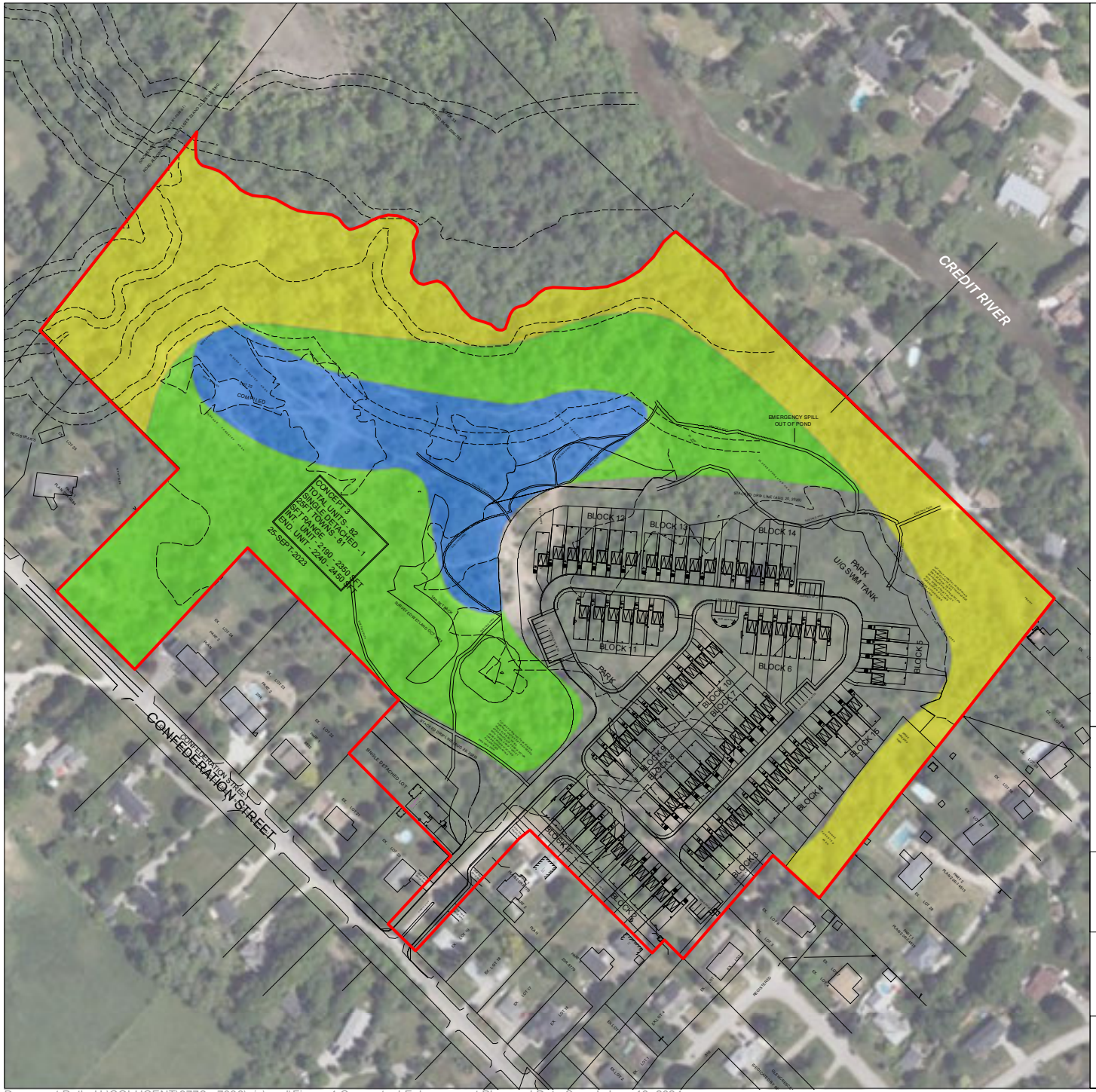

Subject Lands

Conceptual Enhancement Plan

Zone1
Intact native woodland conservation and enhancement

Zone 2
Manitoba maple replacement, with climate resilient hardwoods

Zone 3
Soil amelioration and native plant readiness

Conceptual Ecological Restoration and Enhancement Plan

Environmental Impact Summary Report
159 Confederations Street, Glen Williams, ON
Eden Oak (Bayfield) Inc.

Prepared by: Colucent Environmental

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Figure 4

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Attachment 2:

Photolog (Representative Field Investigation Photographs)

Representative Photographs, 159 Confederation St. Glen Williams ON

2024 Field Inspections – May 5 and 8, and June 4. 2024
Photos Taken by Tom Hilditch, Colucent Environmental Inc.

Photo 1 More mature and intact deciduous woodland, western wooded valley

Photo 2 More mature and intact deciduous woodland, western wooded valley

Photo 3 Wild Ginger within more mature deciduous woodland

Photo 4 North Tributary with informal pedestrian passage

Photo 5 Looking northeast across Cultural Woodland; young, sparse canopy cover

Photo 6 Manitoba Maple, collapsed with vertical stems; Cultural Woodland

Photo 7 Residential mown lawn; interface with Cultural Woodland

Photo 8 Looking east across Cultural Woodland; young, sparse canopy over

Photo 9 Residential interface with Cultural Woodland; mulch pile used by rats

Photo 10 South tributary; poorly defined and dry on June 4, 2024 assessment

Photo 11 Garlic mustard infestation in Cultural Woodland

Photo 12 Small patch of wetland in cultural woodland; willows and dogwoods

Photo 13 Former aggregate extraction area; informal campfire use

Photo 14 Former aggregate extraction area; accessed for off-roading and walking

Photo 15 Former aggregate extraction area; topsoil layers are absent

Photo 16 Former aggregate extraction area; stunted vegetation growth

Photo 17 Former aggregate extraction area; topsoil layers are absent

Photo 18 Informal golf facility and course

Photo 19 Maintained/mown golf fairways

Photo 20 Looking towards maintained/mown golf fairways; Trembling Aspen decline

Attachment 3:

Technical Environmental Implementation Baseline Report, LGL Limited, June 2024

Environmental Implementation Report – Existing Conditions

159 CONFEDERATION STREET
2312390 ONTARIO INC.
GLEN WILLIAMS, ONTARIO

Prepared for:
EDEN OAK HOMES

Prepared by:
LGL Limited
environmental research associates

JULY 2024
TA8885

159 CONFEDERATION STREET
2312390 ONTARIO INC.
GLEN WILLIAMS, ONTARIO

ENVIRONMENTAL IMPLEMENTATION REPORT – EXISTING CONDITIONS

Prepared By:

digital signature

Lisa Catcher, Hons. BA
SENIOR BOTANIST, ISA CERTIFIED ARBORIST

digital signature

Joseph Cavallo, B.Sc.
SENIOR ECOLOGIST

LGL Limited
environmental research associates
22 Fisher Street, PO Box 280
King City, Ontario L7B 1A6
Tel: 905-833-1244
Email: kingcity@lgl.com
URL: www.lgl.com

JULY 2024
TA8885

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1. INTRODUCTION

1.1 Subject Property Location

The Hamlet of Glen Williams is situated along the banks of the Credit River, in the Town of Halton Hills, within the Region of Halton. The 2312390 Ontario Inc. is located at 159 Confederation Street in the Hamlet of Glen Williams (the property). The property is vacant and ranges between approximately 100 m to 150 m from the Credit River. The property has a total lot area of approximately 12.32 ha. Land uses within the vicinity of the property consist of a mix of rural/agricultural areas, open spaces, and dispersed single-detached housing of relatively low density. **Figure 1** illustrates the location of the subject property in a regional context.

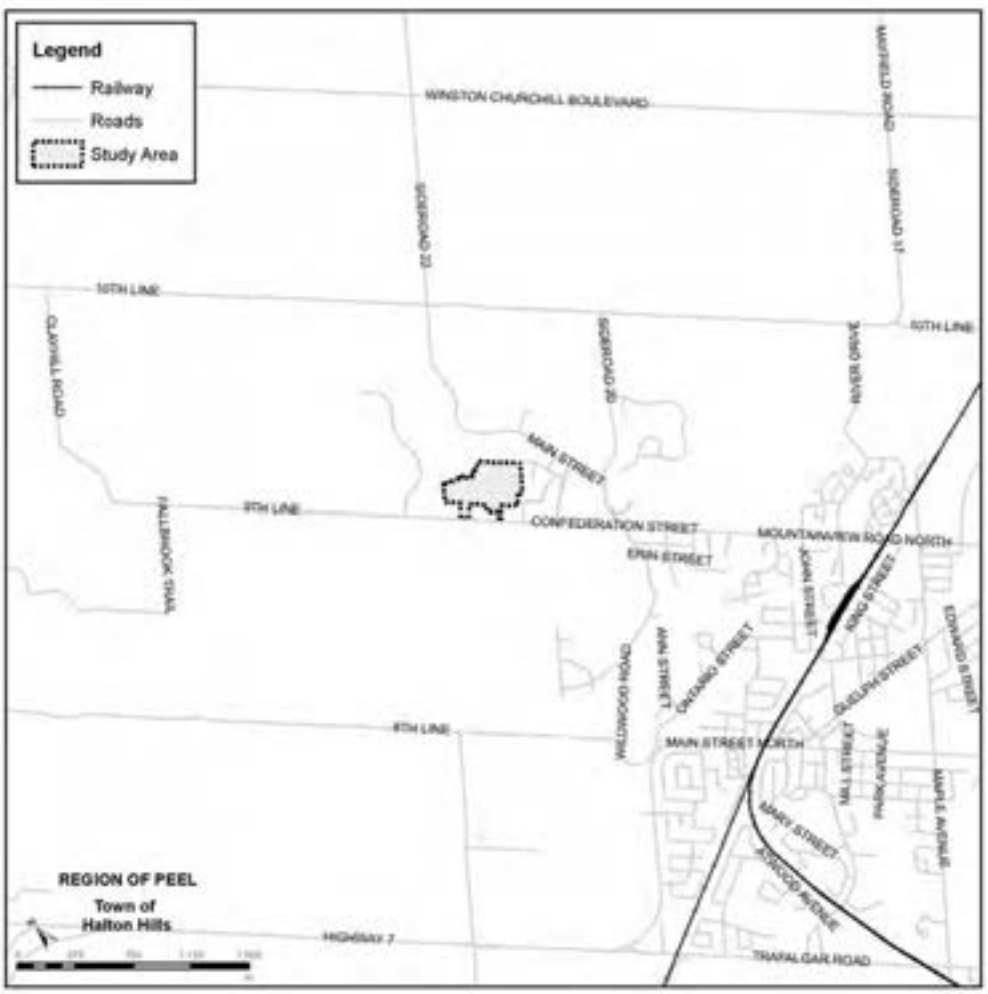

Figure 1: Study Area

1.2 Purpose

LGL Limited has undertaken an investigation and review of environmental baseline conditions on and adjacent to the subject property proposed for residential development in the Hamlet of Glen Williams. The property, part of Lot 26, Concession 10 is owned by 2312390 Ontario Inc. This Existing Conditions Report provides detailed baseline natural heritage data, as input to the assessment of potential impacts, and the application of the full mitigation hierarchy. LGL has collaborated with Colucent Environmental Inc (Colucent) in the dvelopment of the impact assessment and mitigation report.

1.3 Terms of Reference

A Terms of Reference (ToR), **Appendix A**, was prepared in accordance with the policies of the Glen Williams Secondary Plan (2021). The ToR was approved by Halton Region (RMoH), the Town of Halton Hills (ToHH) and Credit Valley Conservation (CVC) in December 2021. This Existing Conditions Report and the Environmental Implementation Report (EIR)(Colucent 2024) generally follow the headings of the ToR.

2. APPROACH AND METHODOLOGY

2.1 Agency Consultation

Preliminary investigations and a review of pertinent background information were completed. This review included information from the CVC, ToHH, RMoH, the Ministry of the Environment, Conservation and Parks (MECP), and the Ministry of Natural Resources and Forestry (MNRF) as required, in order to gain a clear understanding of the natural features and constraints. The Glen Williams Integrated Planning Project Scoped Subwatershed Plan (Dillon, 2003) was also reviewed to ensure that the Draft Plan of Subdivision conforms to the concerns and constraints outlined within those reports.

2.2 Field Studies

Field investigations were undertaken by LGL staff for various environmental factors commencing in April 2019 through to September 2021 and in the summer of 2023. A summary of the natural heritage field investigations carried out are presented below in **Table 1.** Additional field surveys and assessments were completed in 2024 by LGL and Colucent.

Detailed field surveys provided plant and animal species lists for the site, including the presence of significant species and as well an assessment of habitat features onsite. Field visits included observations for the confirmation and refinement of the designated natural features on site.

Table 1: Summary of LGL Natural Heritage Field Investigations

Site Investigation	Dates
Fish and Fish Habitat	March 12, April 4, April 17 and October 19, 2019; and March 5, 19, 30 and July 3, 2020
Botanical, Plant Species at Risk and Ecological Classification of Vegetation Communities	July 9 and August 13, 2019, May 7, June 17, August 20, and September 2, 3 and 25, 2020
Tree Survey and Woodland Delineation	February 24, March 5, 16 and 27, May 1, 7, 8 and 12, August 20, 2020
Confirm and Locate Presence/Absence of Regionally/Locally Rare Species within Development Area	June 17 and August 20, 2020, and July 15 and September 15 2021
Amphibian Surveys	April 4, 17, May 21, and June 12, 2019, March 19, 29, 30 and April 7, 8, May 16 and June 8, 2020
Breeding Birds and Wildlife Surveys	June 11 and July 9, 2019
Bat Snag/Cavity Tree Surveys	February 24, March 5, 16, 27 and August 21, 2020

3. EXISTING CONDITIONS

3.1 Physiography and Soils

The property is located within the Horseshoe Moraines physiographic region. From Singhampton south to Caledon, the moraines lie along the brow and slopes of the escarpment. There are three moraines with trains of outwash between them, the latter sand and gravel terraces often being deeply cut by gullies. Associated with the moraines is a system of old spill-ways with broad gravel and sand terraces and swampy floors. Good cross-sections of this landscape are seen along Highway 7 from Rockwood to Georgetown. The soil material is coarse, open, stony till composed largely of dolostone with traces of red shale, often referred to Dumfries series. Dumfries profiles are usually from 18 to 24 inches in depth and often seen in ditches, road cuts, and borrow pits. The soils of the associated outwash gravels, Caledon series, has a greyish brown sandy loam surface soil underlain by a deep, light yellowish brown and dark yellowish brown horizons. The whole Caledon series profile is often three feet in depth (Chapman and Putnam 1984).

3.2 Aquatic Habitat

3.2.1 Fish and Fish Habitat

The potential for fish and fish habitat within the study area is limited to two tributaries of the Credit River. Site investigations were completed on: March 12, April 4, April 17 and October 19 in 2019; and March 5, 19, 30 and July 3 in 2020.

It should be noted that background information, namely the Department of Fisheries and Oceans (DFO) Aquatic Species at Risk (SAR) mapping (2020) shown below in **Figure 2**, did not identify any aquatic SAR in the study area. In addition, a review of the MNRF 'Make A Map: Natural Heritage Areas' on-line utility did not indicate any records of aquatic SAR within the subject property.

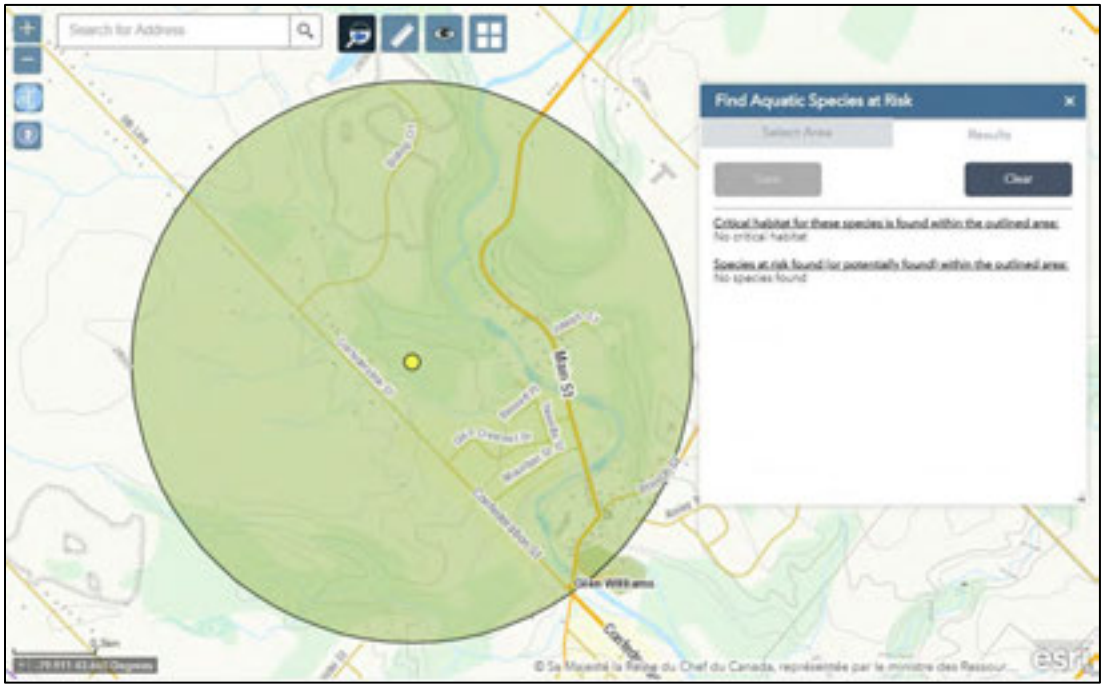

Figure 2: DFO Aquatic SAR Mapping

North Tributary

The tributary located in the north section of the study area is a perennially flowing, well defined channel within a deeply incised valley. The valley and surrounding upland consist of a mixed woodland. The channel generally proceeds in a southeasterly direction in the northern area of the subject property before proceeding easterly prior to its confluence with the Credit River. The stream profile consists of a relatively steep gradient with coarse, stony bed material of boulder, rubble, gravel and sand. Several areas of treefall and woody debris jams were observed during the investigation periods resulting from moderate to severe bank erosion, and erodible soils. Flows appear to fluctuate based on surface runoff although there are likely contributions from groundwater based on the observation of a seepage area within the study area (see **Figure 3**). The seepage did not consist of a significant amount of groundwater input to the channel, and therefore likely had a nominal effect on stream temperature moderation. On July 3, 2020 the temperature of the moist ground where the seepage was discharging was 19.2°C at 3:30 PM. Surveys completed on March 12, 2019 and March 5, 2019 under snow cover did not identify any other groundwater discharge areas which would be apparent from absent snow cover.

The baseflow channel of this tributary varies in width throughout the subject property due to the dynamic nature of the channel in the gravel-dominant substrates and based on seasonally variable flow levels. During the March 5, 2020 field investigation the channel under spring freshet/winter melt flows was 1.0 – 3.5 m in width and a significant volume of water was flowing in the creek. The maximum depth observed was approximately 0.50 m under high flow conditions. A summer water temperature of 22.6°C was recorded approximately 50 m downstream of the groundwater seepage zone at 3:35 PM. This suggests that the stream supports a warmwater to coolwater thermal regime for fish utilization. A combination of groundwater inputs via bank seepage, and potential upwelling into the streambed along with a high amount of canopy cover and associated shading contributes to the moderation of stream temperatures in this tributary.

No fish were observed during any of the site investigations, until the July 3, 2020 visit in which Blacknose Dace (*Rhinichthys obtusus*) and Creek Chub (*Semotilus atromaculatus*) were observed in the mid-reach area of this north tributary. It is likely that fish migrate upstream from the Credit River into the tributary for various life stages. Fish were observed generally in stranded and connected pools approximately 0.3 m in depth and consisted of adults and young-of-the-year, suggesting that fish were successfully spawning in the tributary. However, since the stream channel dries further downstream during the baseflow period (observed during the October 19, 2019 and July 3, 2020 visits) or flows persist interstitially, these fish may or may not survive the summer period in the small pools of water where they were observed. The recorded temperature in the pools was 20.2°C on July 3 at 3:45 PM. No other fish were observed during any of the other fisheries field investigations along this tributary indicating that utilization of this tributary by fish might be a periodic event. Nonetheless, this tributary consists of direct warm/coolwater forage (baitfish) fish habitat.

South Tributary

The tributary found in the south section of the property enters it at Ninth Line/Confederation Street through an approximately 1000 mm diameter CSP. This watercourse consists of disjointed reaches throughout the property from Ninth Line to its confluence off-property, with the Credit River. Three reaches were observed, these consist of: 1) Upstream channel reach; 2) Mid-property wetland – likely created by the past aggregate operations; and 3) downstream reach (see **Figure 3**). These are described below.

Reach 1: The stream segment from Confederation Street to approximately 125 m to the east consists of a small, defined ephemerally flowing channel approximately 0.5 – 1.0 m in width. The substrates vary from fine material consisting of silt/organic in the flatter gradient section of the channel from Ninth Line to approximately 50 m to the east, to coarser materials such as gravel, rubble and introduced landscaping stones downstream in the steeper section of the channel. Flows in this channel were observed on March 5 and 19, 2020, but the channel was dry during the July 3, 2020 visit indicating ephemeral flow conditions. The surrounding vegetation community consists of a more open thicket community in the upper, flatter gradient section to cultural woodland in the downstream section prior to its confluence with the mid-property reach. This reach is not direct fish habitat as a result of the lack of fish passage due to the reach below and the ephemeral nature of flows. This reach does not provide an indirect function to the downstream reaches or to the Credit River, as flows, sediment, nutrients and other contributions cannot proceed past the swamp thicket reach described below.

Reach 2: The channel flows into this next downstream reach, approximately 125 m east of Ninth Line, into a small wetland where the flows are stopped from proceeding any further downstream. The entire wetland reach consists of a series of constructed ponds/pools varying in size and depth for a length of approximately 250 m in a southeast direction. There appears to be no flow connection between the pools and they generally dry quickly between spring freshet and the summer period as does the channel reach described above. This reach does not serve as direct or indirect fish habitat as no flows, sediments, nutrients or other contributors exit this area.

Reach 3: This downstream-most reach consists of an ephemeral poorly defined swale section from the downstream limit of Reach 2 to the property limit. Very little flows have been observed throughout this reach and were only observed on April 4, 2019 but by April 17, 2019 the flows had dried indicating very ephemeral and seasonal flow events. This swale reach originates at the end of the series of wetlands and progresses through a slight depression in the cultural meadow/cultural thicket community in an east to northeast direction toward Tweedle street and eventually the Credit River. There is no defined channel and as such no wetted width dimension or other defining metrics. This reach can be classified as indirect fish habitat as it does provide an indirect contribution, albeit minor, to the Credit River consisting of flows, sediments, nutrients, biota and other allochthonous inputs.

3.2.1 Surface Water (Wetlands)

Wetlands are located in Reach 2 of the South Tributary and consist of several depressions which support ephemeral pools of water during the spring freshet and for a matter of weeks afterward, dependent on weather. The source of flows to this area is from the swale in Reach 1 which, as described above, dries quickly after the spring freshet. It appears that these pools are a result of past aggregate operation on the property and are not natural features. This wetland features do not support direct or indirect fish habitat, as flows are not generally exiting any of the pools but are pooled and infiltrated into the ground. The coarse native soils materials likely encourage rapid infiltration and contribution to the local groundwater aquifer. The water observed in this area (namely in the spring) was stagnant and turbid, with high amounts of woody debris (branches, limbs, dead trees) from the surrounding treed areas. The wetland areas are depicted on Figure 3).

CUM1-1	Dry-Moist Old Field Meadow Type
CUT1	Mineral Cultural Thicket Ecosite
CUT1-1	Sumac Cultural Thicket Type
CUW1	Mineral Cultural Woodland Ecosite
D	Disturbed
FOD6-3	Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest Type
FOD6-5	Fresh-Moist Sugar Maple Hardwood Deciduous Forest Type
FOD7	Fresh-Moist Lowland Deciduous Forest Ecosite
FOM2	Dry-Fresh White Pine-Maple-Oak Mixed Forest Ecosite
M	Manicured

Credit River
TWEEDLE STREET
North Tributary
FOM2
CUW1
CUT1-1/CUT1
M/D
M
FOD7
FOD6-3
CUM1-1
CUM1-1/M
Reach 3
FOD6-5
CUM1-1/CUT1
South Tributary
Reach 2
CUW1
M/D
M
CUT1
Reach 1
CUM1-1/CUT1-1
GLEN CRESCENT DRIVE
CONFEDERATION STREET
0 25 50 75 100 m
N

Data Sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry (LIO) & Condeland Engineering. Contains information licenced under the Open Government Licence - Ontario.

LEGEND

- Anuran Monitoring Station
- Bat Snag Tree
- Breeding Bird Point Count Station
- Groundwater Seepage Area
- Locally Significant Species
- Flow Direction Arrow
- Property Boundary
- Staked Dripline/Significant Woodland Boundary (confirmed with Halton Region staff August 20, 2020)
- Minimum Vegetation Protection Zone (30 m)
- Top of Slope (as staked by CVC June 10, 2014)
- Top of Slope Setback Constraint (10m - 30m)
- Watercourse
- Reach Delineation
- Direct Fish Habitat - Coolwater/Warmwater Forage (Baitfish) Fish Community
- Direct Fish Habitat - Mixed Coldwater/ Coolwater Fish Community
- Indirect Fish Habitat
- Not Fish Habitat
- Waterbody
- Staked Wetland Boundary
- 10m Wetland Setback

Vegetation Communities

- Vegetation Community Boundary

NATURAL HERITAGE ASSESSMENT

LGL LIMITED
environmental research associates

Project	TA8885	Figure	3
Date	January, 2024	Prepared By:	VLG
Scale	1:1,800	Verified By:	LMC

3.2.2 Thermal Conditions

The North Tributary consists of direct warm/coolwater forage (baitfish) fish habitat. Water temperatures recorded on July 3, 2020 were taken in accordance with rapid temperatures assessment methodologies (Stanfield et al., 2001). The air temperature was 32°C and no rain had fallen within the last several days and temperatures were taken late in the day once flows had accumulated heat from the first part of the day. The temperatures recorded in the tributary were 20.2°C and 22.6°C at two separate mid-reach locations, indicating warmwater to coolwater conditions. The fish observed (Blacknose Dace and Creek Chub) are tolerant, warmwater forage species. The Credit River Fisheries Management Plan or CRFMP (CVC and MNRF, 2002) has identified this tributary as being managed for a 'Small warmwater fish community'.

The south tributary does not have a thermal regime due to the lack of channel form and ephemeral flows. The indirect function of this tributary is primarily from sediment, nutrients and other inputs. The CRFMP (2002) has identified this tributary as being managed for a 'Small warmwater fish community'. However, this may only apply to the lower reach where the tributary flows into the Credit River during a short period of time during the spring freshet.

The Credit River is the receiving waterbody for both of the tributaries and is managed as a 'Mixed cold/coolwater fish community' (CRFMP, 2004).

3.2.3 Stream Morphology

For details related to the morphology of the North Tributary, please refer to the Bayfield – Eden Oak Meander Belt Width Assessment report prepared by Parish Geomorphic (January 2017), provided under separate cover. It should be noted that the three reaches assessed of the North Tributary (Reaches 6b, 7 and 8) were all classified as 'In Regime' using the Rapid Geomorphic Assessment (RGA) protocol indicating that the channel is stable and functioning normally, and that 'evidence of instability is isolated or associated with normal river meander propagation processes' (Parish, 2017).

No morphological assessment was completed for the South Tributary. The only defined section of channel which could be assessed using the RGA protocol would be Reach 1 as identified by LGL above. The other reaches (2 and 3) do not have a defined channel form, and therefore no morphological assessment was practical.

3.2.4 Headwater Study

The Evaluation, Classification and Management of Headwater Drainage Features Guidelines (HDFG) completed by the CVC and the Toronto and Region Conservation Authority (TRCA) in 2014, was used to classify the two tributaries.

North Tributary

The following classifications have been made for the North Tributary (see **Table 2** and **Figure 4** below).

Table 2: Summary of Functional Classifications and Management of the North Tributary

Step 1	**Step 2**	**Step 3**	**Step 4**	**Management Recommendations**
Hydrology Classification	**Riparian Classification**	**Fish and Fish Habitat Classification**	**Terrestrial Habitat Function**	**See flow chart below**
Important Functions – Perennial Water is present throughout the year, as either flowing or standing surface water (wetlands or refuge pools) as a result of year round groundwater discharge (i.e. seeps, springs, wetlands or upwellings).	Important Functions – the feature type is wetland and/or any of the riparian corridor categories (0-1.5 m, 1.5-10 m, or 10-30 m on either side of the feature) is dominated by forest or thicket/scrubland communities or wetland.	Important Functions – Fish are present year-round (permanent habitat) in standing pools; or suitable habitat present for fish spawning/rearing; or feature designated as occupied SAR habitat.	Valued Functions – General amphibian habitat: stepping stone habitat (stop over to higher quality habitat) or suitable for feeding or hydration for low mobility wildlife (i.e. amphibians). Wetland habitat occurs within the corridor, but no breeding amphibians are present.	PROTECTION

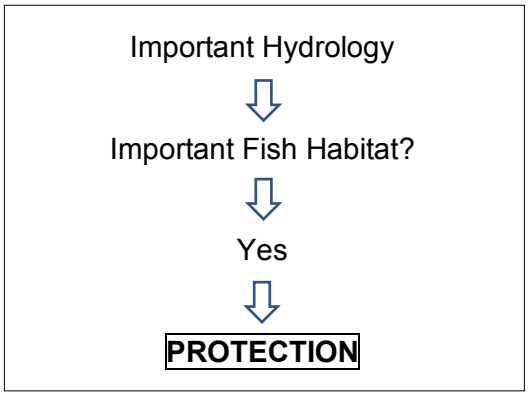

Figure 4: Flow Chart Providing Direction on Management Options for the North Tributary

The management recommendation for the North Tributary from the HDFG is Protection – Important Functions as indicated from **Figure 4** above. The following has been taken from the HDFG:

- *Protect and/or enhance the existing feature and its riparian zone corridor, and groundwater discharge or wetland in-situ;*
- *Maintain hydroperiod;*
- *Incorporate shallow groundwater and base flow protection techniques such as infiltration treatment;*
- *Use natural channel design techniques or wetland design to restore and enhance existing habitat features, if necessary; realignment not generally permitted;*
- *Design and locate the stormwater management system (e.g. extended detention outfalls) are to be designed and located to avoid impacts (i.e. sediment, temperature) to the feature.*

South Tributary

The following classifications have been made for the South Tributary (see **Table 3** and **Figure 5** below).

Table 3: Summary of Functional Classifications and Management of the South Tributary

Step 1	**Step 2**	**Step 3**	**Step 4**	**Management Recommendations**
Hydrology Classification	**Riparian Classification**	**Fish and Fish Habitat Classification**	**Terrestrial Habitat Function**	**See flow chart below**
Recharge Functions– Dry or Standing Water: No surface flow occurs.	Important Functions Wetland and/or any of the riparian corridor categories (0-1.5 m, 1.5-10 m, or 10-30 m on either side of the feature)	Contributing Functions – Contributing fish habitat. Transport of allochthonous materials (detritus, insects, etc.) to downstream fish-bearing reaches provides sources of food.	Valued Functions – General amphibian habitat: stepping stone habitat (stop over to higher quality habitat) or suitable for feeding or hydration for low mobility wildlife (i.e. amphibians). Wetland habitat occurs within the corridor, but no breeding amphibians are present.	MAINTAIN RECHARGE

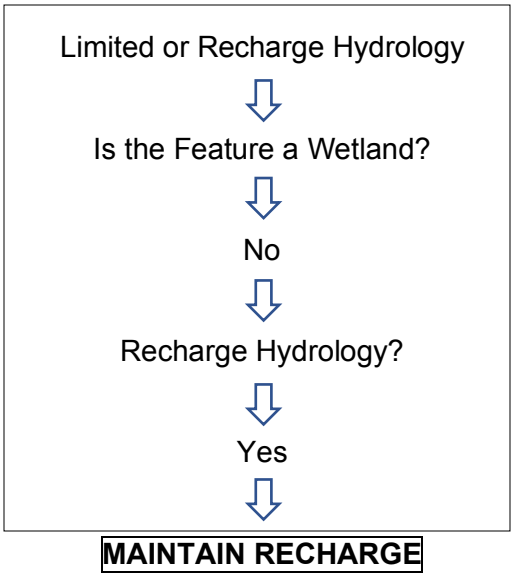

Figure 5: Flow Chart Providing Direction on Management Options for the South Tributary

The management recommendation from the HDFG for the South Tributary is Recharge Protection – Recharge Functions as indicated from **Figure 5** above.

The following has been taken from the HDFG:

- *Maintain overall water balance by providing mitigation measures to infiltrate clean stormwater, unless the area qualifies as an Area of High Aquifer Vulnerability under the Oak Ridges Moraine Conservation Plan (ORMCP) or Significant Recharge Areas under the Source Water Protection Act. These areas will be subject to specific policies under their respective legislation.*
- *Terrestrial features may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with them.*

Table 4 provides a summary of the management recommendations for the North and South Tributaries, from the HDFG.

Table 4: Summary of Management Recommendations and Implications for Development Proposals

Management Implications	North Tributary-Protection	South Tributary-Recharge Protection
Recharge Functions– Dry or Standing Water: No surface flow occurs.	Important Functions Wetland and/or any of the riparian corridor categories (0-1.5 m, 1.5-10 m, or 10-30 m on either side of the feature)	Contributing Functions – Contributing fish habitat. Transport of allochthonous materials (detritus, insects, etc.) to downstream fish-bearing reaches provides sources of food.
Must remain open	Yes	N/A
Relocate using natural channel design	Not permitted, enhancement only	N/A
Maintain or replicate groundwater or wetlands	Maintain or enhance	Maintain overall infiltration rates at site
Maintain hydroperiod	Yes	N/A
Direct connection to downstream	Yes	N/A
Replicate function through enhanced lot level conveyance	N/A	N/A

3.2.5 Species at Risk

The MECP was contacted on August 3, 2021 to request species at risk (SAR) data. The MECP also provides guidelines to undertake preliminary screening for SAR (MECP May 2019). LGL undertook a background review of fish SAR occurrences within the subject property in accordance with the screening guideline, including through the Natural Heritage Information Centre (NHIC) (MNRF 2020). There are no aquatic species at risk records within or adjacent to the property (MECP, 2024).

In addition, no aquatic SAR were identified in the study area or the surrounding area by the Department of Fisheries and Oceans Aquatic Species at Risk Mapping (2024).

3.3 Vegetation and Vegetation Communities

The geographical extent, composition, structure and function of the vegetation communities were identified through air photo interpretation and field investigations. Air photos were interpreted to determine the limits and characteristics of the vegetation communities in the property. Multi-season botanical field investigations were undertaken within the property on July 9 and August 13, 2019, May 7, June 17, August 20, and September 2, 3 and 25, 2020. The field investigations of the vegetation communities were undertaken within the subject property and adjacent habitat, to the extent possible.

The vegetation communities were classified according to the *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* (Lee et al. 1998). A plant list and a description of the general structure of vegetation were obtained during the field investigations. Plant species status was reviewed for Ontario (Oldham 2009) and CVC (Kaiser 2001). Vascular plant nomenclature follows Newmaster et al. (1998) with a few exceptions that have been updated to Newmaster et al. (2005).

3.3.1 Vegetation Communities

Vegetation communities within the subject property consist of a mixture of forest and cultural communities. A total of eight Ecological Land Classification (ELC) vegetation community types were identified within the subject property including: Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest (FOD6-3), Fresh-Moist Sugar Maple Hardwood Deciduous Forest (FOD6-5), Dry-Fresh White Pine-Maple-Oak Mixed Forest (FOM2), Fresh-Moist Lowland Deciduous Forest (FOD7), Dry-Moist Old Field Meadow (CUM1-1), Mineral Cultural Thicket (CUT1), Sumac Cultural Thicket (CUT1-1), and Mineral Cultural Woodland (CUW1). All of the vegetation communities identified within the subject property are considered widespread and common in Ontario and are secure globally. These communities are delineated in **Figure 3** and described in **Table 5**.

Forest Communities

The natural/semi-natural features within the subject property consist of a mixture of deciduous and mixed forest communities. The relatively intact forest communities are generally associated with the North Tributary and with a top of slope along the northern property boundary. The majority of treed areas on the subject property are cultural woodlands, discussed below. The more intact forest communities extend beyond the subject property and are considered to be of moderate to higher quality. In general, the more intact forest communities within the subject property support a higher proportion of specialized and native plant species and had not been subject widespread anthropogenic disturbance. As noted in the following section, the majority of vegetation on the subject property results from former aggregate extraction activity and stunted natural succession.

Cultural Vegetation Communities

The cultural vegetation communities within the subject property contained a high proportion of non-native plant species that are well adapted to persist in areas that are regularly disturbed including species that are adapted to high light conditions, limited soil moisture and species that are tolerant of salt spray.

Three large cultural meadow communities were identified within the central portion of the subject property. Plant species within the cultural meadow communities are largely composed of non-native old field species. Within the cultural meadow communities on the north east side of the subject property young trembling aspen (*Populus tremuloides*) are beginning to establish and succession is occurring, although the pace of natural succession is slowed by the absence of topsoil. The cultural meadow communities within the subject property are subject to regular anthropogenic disturbance including dirt biking and mowing for an *ad hoc* golf course. Cultural thicket habitat was identified throughout the subject property. In general these cultural meadow and thicket communities are early successional and support low quality habitat.

The cultural woodland communities within the subject property support a low diversity of native plant species and are considered to be of low quality. Overall, the health of the trees within the two cultural woodland communities are considered to be in fair to poor condition. Many of the trees within the cultural woodland communities are showing signs of decline including crown dieback, pests, diseases and poor structure (i.e., broken limbs and weak unions). Evidence of disturbance is prevalent throughout the cultural woodlands including informal trails, dumping, significant amount of woody debris and a high proportion of non-native and invasive plant species. Within the cultural woodland on the west side of the property are several small inclusions of swamp thicket (SWT) habitat. The wetland inclusions are dominated by red-osier dogwood (*Cornus sericea* ssp. *sericea*) and willow species (*Salix* spp.) within a low-lying area and is likely a result of significant habitat disturbance related to previous land use (i.e., gravel pit). The limits of the swamp thicket inclusions were staked with CVC stake on September 28, 2023 and are presented on **Figure 3**.

There are several areas that are not identified as ELC vegetation communities including manicured areas (M) which include mown lawns, gardens and planted trees. The limits of the manicured areas are presented on **Figure 3**.

Table 5: Summary of Ecological Land Classification Vegetation Communities

ELC Code	Vegetation Type	Species Association	Comments
Terrestrial-Cultural			
CUM	CULTURAL MEADOW		
CUM1-1	Dry – Moist Old Field Meadow	**Emergent Trees/Shrubs:** includes Scotch pine (*Pinus sylvestris*), eastern white cedar (*Thuja occidentalis*), silver maple (*Acer saccharinum*), and Manitoba maple (*Acer negundo*). **Ground Cover:** includes Kentucky blue grass (*Poa pratensis* ssp. *pratensis*), wild carrot (*Daucus carota*), Canada goldenrod (*Solidago canadensis*), New England aster (*Symphyotrichum novae-angliae*), common dandelion (*Taraxacum officinale*), and common milkweed (*Asclepias syriaca*).	• Cultural communities (CU). • Tree cover and shrub cover < 25 % (M). • This community can occur on a wide range of soil moisture regimes (Dry-Moist) (-1). • Pioneer community resulting from, or maintained by, anthropogenic-based disturbances.
CUM1-1/CUT1	CULTURAL MEADOW/CULTURAL THICKET		
CUM1-1/CUT1	Dry-Moist Old Field Meadow/Mineral Cultural Thicket	**Canopy:** includes Scotch pine, black walnut (*Juglans nigra*), apple (*Malus pumila*), and trembling aspen (*Populus tremuloides*). **Understory:** includes Tartarian honeysuckle (*Lonicera tatarica*), common buckthorn (*Rhamnus cathartica*), red-osier dogwood (*Cornus sericea* ssp. *sericea*), and trembling aspen. **Ground Cover:** includes Kentucky bluegrass, wild red raspberry (*Rubus idaeus* ssp. *idaeus*), dame's rocket (*Hesperis matronalis*), and tufted vetch (*Vicia cracca*).	• Cultural communities (CU). • Tree cover and shrub cover < 25 % (M). • This community can occur on a wide range of soil moisture regimes (Dry-Moist) (-1). • Pioneer community resulting from, or maintained by, anthropogenic-based disturbances. • Cultural community (CU). • Tree cover <25 %; shrub cover >25% (T). • Mineral soil (1).
CUM1-1/CUT1-1		**Canopy:** includes staghorn sumac (*Rhus hirta*), black walnut, red ash (*Fraxinus pennsylvanica*), and white elm (*Ulmus americana*). **Understory:** includes staghorn sumac, common buckthorn, common apple, and alternate-leaved dogwood (*Cornus alternifolia*). **Ground Cover:** includes awnless brome (*Bromus inermis* ssp. *inermis*), Canada goldenrod, wild red raspberry, herb-robert (*Geranium robertianum*), and yellow avens (*Geum aleppicum*).	• Cultural communities (CU). • Tree cover and shrub cover < 25 % (M). • This community can occur on a wide range of soil moisture regimes (Dry-Moist) (-1). • Pioneer community resulting from, or maintained by, anthropogenic-based disturbances. • Cultural community (CU). • Tree cover <25 %; shrub cover >25% (T). • Mineral soil (1).

Table 5: Summary of Ecological Land Classification Vegetation Communities

ELC Code	Vegetation Type	Species Association	Comments
			• Sumac dominant (-1).
CUT	CULTURAL THICKET		
CUT1	Mineral Cultural Thicket	**Canopy:** includes black locust (*Robinia pseudoacacia*), black walnut, and Manitoba maple. **Understory:** includes staghorn sumac, Manitoba maple, black locust, common buckthorn, and Tartarian honeysuckle. **Ground Cover:** includes yellow avens, Canada goldenrod, thimble-berry (*Rubus occidentalis*), garlic mustard (*Alliaria petiolata*), and herb-robert.	• Cultural community (CU). • Tree cover <25 %; shrub cover >25% (T). • Mineral soil (1).
CUT1-1/CUT1		**Canopy:** includes white pine (*Pinus strobus*), black walnut, Scotch pine, Manitoba maple, and poplar species (*Populus* spp.). **Understory:** includes staghorn sumac, common buckthorn, Manitoba maple, large-fruited thorn (*Crataegus punctata*), and common lilac (*Syringa vulgaris*). **Ground Cover:** includes yellow rocket (*Barbarea vulgaris*), Canada goldenrod, thimble-berry, scarlet strawberry (*Fragaria virginiana* ssp. *virginiana*), awnless brome, and Kentucky bluegrass.	• Cultural community (CU). • Tree cover <25 %; shrub cover >25% (T). • Mineral soil (1). • Sumac dominant (-1). • Cultural community (CU). • Tree cover <25 %; shrub cover >25% (T). • Mineral soil (1).
CUW	CULTURAL WOODLAND		
CUW1	Mineral Cultural Woodland	**Canopy:** includes Manitoba maple, poplars, Siberian elm (*Ulmus pumila*), white spruce (*Picea glauca*), eastern white pine, white willow (*Salix alba*), and crack willow (*Salix fragilis*). **Understory:** includes Manitoba maple, Missouri willow (*Salix eriocephala*), staghorn sumac, alternate-leaved dogwood, eastern white cedar, and choke cherry (*Prunus virginiana* var. *virginiana*), and black walnut. **Ground Cover:** includes large-leaved aster (*Eurybia macrophylla*), yellow avens, purple dead-nettle (*Lamium purpureum*), yellowish enchanter's nightshade (*Circaea lutetiana* ssp. *canadensis*), and thimble-berry.	• Cultural communities (CU). • 35% < tree cover ≤ 60 % (W). • Mineral soil (-1). • Resulting from, or maintained by. anthropogenic-based disturbances.

Table 5: Summary of Ecological Land Classification Vegetation Communities

ELC Code	Vegetation Type	Species Association	Comments
Terrestrial-Natural/Semi-natural/Cultural			
FOD	DECIDUOUS FOREST		
FOD6-3	Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest	**Canopy:** includes sugar maple (*Acer saccharum* var. *saccharum*), basswood (*Tilia americana*), yellow birch (*Betula alleghensis*), eastern white pine, and American beech (*Fagus grandifolia*). **Understory:** includes sugar maple, basswood (*Tilia americana*), white spruce, nannyberry (*Viburnum lentago*), American beech, choke cherry, and geulder rose (*Viburnum opulus*). **Ground Cover:** includes zig-zag goldenrod (*Solidago flexicaulis*), wild lill-of-the-valley (*Maianthemum canadense*), Virginia water-leaf (*Hydrophyllum virginianum*), and large-leaved aster.	• Tree cover > 60 % (FO). • Deciduous trees > 75 % of canopy cover (D). • Moist to fresh moisture regime, sugar maple dominant (6). • Yellow birch associates (-3).
FOD6-5	Fresh-Moist Sugar Maple Hardwood Deciduous Forest	**Canopy:** includes sugar maple, trembling aspen (*Populus tremuloides*), black walnut, Freeman's maple (*Acer* X *Freemanii*), American beech, and white birch (*Betula papyrifera*). **Understorey:** includes sugar maple, common buckthorn, alternate-leaved dogwood, choke cherry, Tartarian honeysuckle, and ironwood (*Ostrya virginiana*). **Ground Cover:** includes white avens (*Geum canadense*), zig-zag goldenrod, wild sarsaparilla (*Aralis nudicaulis*), wild-lily-of-the-valley, herb-robert, and white trillium (*Trillium grandiflorum*).	• Tree cover > 60 % (FO). • Deciduous trees > 75 % of canopy cover (D). • Moist to fresh moisture regime, sugar maple dominant (6). • Hardwood associates (-5).
FOD7	Fresh-Moist Lowland Deciduous Forest	**Canopy:** includes Siberian elm, black walnut, Manitoba maple, red ash, and black cherry (*Prunus serotina*). **Understorey:** includes Manitoba maple, red ash, choke cherry and Tartarian honeysuckle. **Ground Cover:** includes Canada goldenrod, dame's rocket, white avens, and lily-of-the-valley (*Convallaria majalis*).	• Tree cover > 60 % (FO). • Deciduous trees > 75 % of canopy cover (D). • Middle to lower slopes, seepage areas and bottomlands topographic positions (7).
FOM	Mixed Forest		

Table 5: Summary of Ecological Land Classification Vegetation Communities

ELC Code	Vegetation Type	Species Association	Comments
FOM2	Dry-Fresh White Pine-Maple Oak Mixed Forest	**Canopy:** includes white pine, Scotch pine, bur oak (*Quercus macrocarpa*), black walnut, trembling aspen, eastern white cedar, and basswood. **Understorey:** includes white pine, black walnut, large-fruited thorn, choke cherry, common maple, and Manitoba maple. **Ground Cover:** includes yellowish enchanter's nightshade, lily-of-the-valley, Canada goldenrod, yellow avens, and prickly gooseberry (*Ribes cynosbati*), and Pennsylvania sedge (*Carex pensylvanica*).	• Tree cover > 60 % (FO). • Coniferous trees > 25 % and deciduous trees > 25 % of canopy cover (M). • White pine with oak associates (2).
OTHER			
M*	Manicured grasses and planted shrubs and/or trees	Areas where large expanses of grass/shrubs/trees are maintained and/or planted.	

3.3.2 Woodland Dripline Staking

The deciduous, mixed and cultural woodlands on the subject property have been the subject of detailed surveys over time. Analyses in 2020 included establishing and surveying 10 m x 10 m squares on a grid throughout the subject property. Results of the plot tallies were used to determine which areas would meet criteria for the standard definition of woodlands (per the Region of Halton). , as defined by the Region of Halton. The limits of the woodland were staked by LGL staff on August 20, 2020. The forester with Halton Region Forester (Ron Reinholt) attended that staking. The limits of the woodland dripline, as staked in 2020 are presented on **Figure 2 and 3**.

Ongoing field investigations by LGL and Colucent in 2024 have caused the technical team to revisit what areas would most appropriately be defined as relatively intact woodlands, that are important to conserve. The ongoing deterioration of areas mapped as cultural woodland and the persistent presence of invasive and aggressive invasive plant species were considered along with the disturbance origins of the cultural woodland. Constraints and opportunities associated with woodlands on the subject property are discussed further in the impact assessment reporting (Colucent 2024).

3.3.3 Flora

A total of 161 plant species have been recorded within the subject property. Two of these plants could only be identified to genus and are not included in the following calculations. Of the 159 plants identified to species, 89 (56%) plant species identified are native to Ontario and 70 (44%) plant species are considered introduced and non-native to Ontario. This high percentage of non-native plant species is most reflected in cultural vegetation communities on the subject property. A list of vascular plants is presented in **Appendix C**. Definitions of the acronyms and species ranks used in **Appendix C** are described in **Appendix D**.

3.3.4 Regionally Rare and Provincial Track Species

Plant species status was reviewed to determine their significance in relation to national, provincial and local status. No nationally tracked plant species were identified within the subject property. A single provincially tracked species butternut (*Juglans cinerea*) was identified within the property and is further discussed in **Section 3.3.5**. Regional and local plant species status was reviewed using *The Vascular Plant Flora of the Region of Peel and the Credit River Watershed* (Kaiser 2001). Four plant species considered regionally rare and four plant species considered locally rare were identified within the subject property. **Table 6** provides a summary of the regionally and locally rare plant species identified within the subject property and in which vegetation community they were found. The locations and distributions of regionally rare plant species for those located within the development footprint or within proximity to the development footprint, plant species locations were recorded with a EOS Arrow 100 GPS unit with +/- 1 m accuracy. The locations of these rare plant species are presented on **Figure 3**.

Table 6: Summary of Rare Plants Species in The Subject Property

Plant Community	Scientific Name	Common Name	Rarity Status		
			S Rank	Regional	Local
FOD6-3*	*Equisetum pratense*	meadow horsetail	S5	Yes	Yes
CUW1	*Picea glauca*	white spruce	S5	No	Yes
CUW1, CUT1-1/CUT1, M	*Juniperus virginiana*	eastern red cedar	S5	Yes	No
CUM1-1, CUW1	*Penstemon hirsutus*	hairy beard-tongue	S4	Yes	Yes

*Plant species is well outside of the development footprint, thus, its location was not recorded.

3.3.5 Species At Risk

The MECP was contacted on August 3, 2021 to request SAR data. The MECP also provides guidelines to undertake preliminary screening for SAR (MECP May 2019). LGL staff previously conducted a background review of plant SAR occurrences within the subject property in accordance with the screening guideline, including the NHIC through MNRF mapping online (MNRF 2020). A response from MECP was received on October 14, 2021. Butternut (*Juglans cinerea*) was the only plant species occurrence record within and/or adjacent to the study area identified by MECP and on NHIC.

Butternut is regulated as Endangered under the Ontario *Endangered Species Act, 2007* (ESA). During LGL's field investigation on the subject property, a total of 93 butternut were identified within the subject property. As noted above, Butternut is regulated as Endangered under the Ontario ESA and receives habitat protection up to 50 m from the trunk of the tree. As such, any works within the 50 m habitat protection zone of a butternut may be subject to the requirements of the ESA. Overall, butternut trees identified on the subject property range in size from 1 to 32 cm diameter at breast height and are in varying states of health. A Butternut Health Assessment (BHA) was undertaken in August 2023 and submitted to MECP for review.

In addition, two Black ash (*Fraxinus nigra*) trees were identified within the property during LGL's field investigations. As of January 2024, Black ash is regulated under the ESA as Endangered. As such, all healthy black ash trees measuring 8 cm DBH and larger in the Region of Halton are regulated by the ESA and receive 30 m habitat protection.

No other plant species that are regulated under the Ontario ESA or the Canada *Species at Risk Act* (SARA) were encountered (those plant species regulated as Endangered, Threatened, or Special Concern) during any of LGL's botanical investigations. A description of provincial species ranks is provided in **Appendix D**.

3.3.6 Designated Natural Areas

Designated natural areas include areas that have been identified for protection by the Ontario MNRF, CVC, RMoHH, and the ToHH. A summary of all designated natural areas within the subject property are presented below.

3.3.6.1 Provincially Significant Wetlands (PSWs)

There are no Provincially Significant Wetlands (PSWs) located on the subject property or within 120 m of the subject property.

3.3.6.2 Areas of Natural and Scientific Interest (ANSIs)

There are no Areas of Natural and Scientific Interest (ANSIs) located on the subject property or within 120 m of the subject property.

3.3.6.3 Environmentally Significant Areas (ESAs)

There are no Environmentally Sensitive Areas (ESAs) located on the subject property or within 120 m of the subject property.

3.3.6.4 Significant Woodlands

Under the Planning Act, municipalities are required to conduct land use planning in accordance with the policies of the Provincial Policy Statement or PPS (Ministry of Municipal Affairs and Housing or MMAH, 2020). The PPS contains policies related to the protection of natural heritage features and functions, as well as natural hazards. The PPS provides criteria for significant natural heritage features including significant woodlands. An analysis was undertaken to determine if the woodlot within the subject property would be considered significant under the PPS. **Table 7** provides a summary of the key criteria for determining significant woodlands and whether or not the woodlot in the subject property satisfies these criteria.

As indicated in **Table 7**, the woodlands within the subject property meet the criteria for significant woodland according to the PPS. More recent 2024 surveys have confirmed that significance delineation to the deciduous and mixed woodland communities. Cultural woodlands have been deemed not to merit a significance delineation (Colucent 2024). However, the majority of woodlands, including cultural woodlands are proposed for retention. The retained cultural woodlands will require substantial restoration and enhancement to improve the condition, viability and resilience of these treed areas

Table 7. Summary of Significant Woodland Analysis

Policy	Criteria	Satisfies Criteria
Provincial Policy Statement	**Woodland Size Criteria**	
	Where woodlands cover: • Is less than about 5% of the land cover, woodlands 2 ha in size or larger should be considered significant • Is about 5-15% of the land cover, woodlands 4 ha in size or larger should be considered significant • Is about 15-30% of the land cover, woodlands 20 ha in size or larger should be considered significant • Is about 30-60% of the land cover, woodlands 50 ha in size or larger should be considered significant • Occupies more than about 60% of the land, a minimum size is not suggested, and other factors should be considered.	Yes (intact deciduous and mixed forest communities)
	Ecological Function Criteria	
	• Woodland Interior • Proximity to other woodlands or habitats • Linkages • Water protection • Woodland diversity	Yes – proximity to other woodlands, linkages
	Uncommon Characteristics Criteria	
	• Woodlands that are uncommon in terms of species composition, cover type, age or structure	No
	Economic and Social Functional Values Criteria	
	• Woodlands that have high economic or social values through particular site characteristics or deliberate management	No

3.4 Wildlife and Wildlife Habitat

Field investigations were conducted with the purpose of documenting wildlife and wildlife habitat, while characterizing the nature, extent and significance of wildlife usage within the study area. Direct observations, calls and tracks were used to record wildlife presence within the study area. Targeted surveys were completed during the 2019 and 2020 field seasons to document breeding bird, anuran breeding, salamander breeding and maternity bat roost habitat. A summary of survey date(s), tasks and weather are presented in **Table 8**.

Table 8: Summary of Date of Inventory, Task, Weather and Personnel

Date of Inventory	Task	Weather	Personnel Involved
April 4, 2019	Salamander breeding habitat characterization and egg-mass survey	9°C, 10 km winds, recent precipitation (last 24 hrs)	David Smith (LGL)
April 17, 2019	Anuran survey	10°C, 5 km winds, recent precipitation (last 24 hrs)	David Smith (LGL)
May 21, 2019	Anuran survey	14°C, 11 km winds,	David Smith (LGL)
June 11, 2019	Breeding Bird survey and incidental wildlife survey	19°C, 12 km winds, 50% cloud cover	David Smith (LGL)
June 12, 2019	Anuran Survey	22°C, 8 km winds,	David Smith (LGL)
July 9, 2019	Breeding Bird survey and incidental wildlife survey	22°C, 8 km winds, 10% cloud cover	David Smith (LGL)
March 19, 2020	Salamander breeding habitat characterization and egg-mass survey	5°C, 11 km/hr winds, recent precipitation (last 24 hrs)	Joseph Cavallo (LGL)
March 29, 2020	Salamander breeding habitat characterization and egg-mass survey	8°C, 15 km winds, recent precipitation (last 24 hrs)	Joseph Cavallo (LGL)
March 30, 2020	Salamander breeding habitat characterization and egg-mass survey	8°C, 17 km winds, recent precipitation (last 24 hrs)	Nancy Falkenberg (LGL)
April 7, 2020	Anuran Survey	7ºC, light rain, some lightning, 10 km/hr wind	Erin Blenkhorn (LGL)
April 8, 2020	Salamander breeding habitat characterization and egg-mass survey	12°C, 15 km winds, recent precipitation (last 24 hrs)	David Smith (LGL)
May 16, 2020	Anuran Survey	13ºC, cloudy, light wind at 10 km/hr, no precipitation	Nancy Falkenberg (LGL)
June 8, 2020	Anuran Survey	20ºC, clear, light wind at 5 km/hr, no precipitation	Nancy Falkenberg (LGL)

3.4.1 Wildlife Species

Based on field observations, 32 species of wildlife could be verified in the subject property. The majority of identified wildlife were bird species. A summary of wildlife species documented in the study area during field investigations is presented in **Table 9**.

Several species that are considered area-sensitive and/or interior species according to the Significant Wildlife Habitat Technical Guide (MNRF, 2000) were identified within the study area (**Table 9, Column 'Other'**). Discussions regarding Significant Wildlife Habitat (SWH) within the property are presented in **Section 3.4.7.1**.

3.4.2 Herpetofauna

3.4.2.1 Amphibians

Methodologies outlined in the Marsh Monitoring Program Protocol (2000) were applied to confirm presence/absence of anuran species, document potential breeding habitat/areas, and to confirm the nature, extent and significance of amphibian usage. Stations were strategically placed where amphibian breeding habitat was suspected, based on air-photo interpretation and a ground-truthing review of the study area, prior to surveys (see **Figure 3**). Field investigations within the study area were conducted on three separate nights during the spring and summer of both 2019 and 2020. Surveys were conducted half hour after sunset, ended prior to midnight and were conducted during appropriate weather conditions (see **Table 8**). Investigations were undertaken during periods of peak anuran breeding activity and vocalization.

Anuran breeding evidence was documented for Spring Peeper (*Pseudacris crucifer*) in 2019 and 2020, and American Toad (*Bufo americanus*) in 2020. The call codes associated with the vocalizing male Spring Peeper and American Toad are presented in **Table 10**. A single Spring Peeper was heard calling at Anuran Station #1 during 2019 and two individuals were heard calling during 2020. Three American Toads were heard calling from Anuran Station #3 during the May 16, 2020 targeted amphibian surveys and a singular American Toad was heard calling on June 16, 2020 daytime field investigations, which was recorded as an incidental observation. Aquatic habitats associated with Station #1 consist of a series of small wetlands (Reach 2) which are fed by a small ephemeral stream located further to the east (Reach 1). Despite frequent precipitation events, dry conditions were observed in early spring (March 19, 2020 and April 8, 2020) during detailed monitoring of the wetlands in 2020; however, the pools contained standing water during other spring visits. Based on both years of anuran call data and observations of site conditions associated with the wetlands, these aquatic habitats are expected to provide limited function for breeding anuran species.

Table 9. Wildlife Species Documented and Breeding Bird Results

Wildlife	Scientific Name	Common Name	SARA[1]	ESA[1]	Legal Status[1]	Other[1]	BBE[2]	Station #[3]
Birds	*Bombycilla cedrorum*	Cedar Waxwing			MBCA		H	3
	Cardinalis cardinalis	Northern Cardinal			MBCA		T	3
	Charadrius vociferus	Killdeer			MBCA		T	3, 4
	Corvus brachyhrynchos	American Crow			-		T	1, 2, 4
	Cyanocitta cristata	Blue Jay			FWCA (P)		H	4
	Dumetella carolinensis	Gray Catbird			MBCA		T	3, 4
	Hirundo rustica	Barn Swallow	SC	SC	MBCA		H	4
	Megaceryle alcyon	Belted Kingfisher			FWCA (P)		S	2,
	Melospiza melodia	Song Sparrow			MBCA		T	1, 2, 3, 4
	Myiarchus crinitus	Great Crested Flycatcher			MBCA		T	3
	Passerculus sandwichensis	Savannah Sparrow			MBCA	SWH	T	3, 4
	Passerina cyanea	Indigo Bunting			MBCA		S	1, 4
	Picoides pubescens	Downy Woodpecker			MBCA		H	1
	Poecile atricapillus	Black-capped Chickadee			MBCA		T	1, 3, 4
	Quiscalus quiscula	Common Grackle			-		H	2, 3
	Setophaga petechia	Yellow Warbler			MBCA		T	3
	Sitta carolinensis	White-breasted Nuthatch			MBCA	SWH	T	1, 3
	Spinus tristis	American Goldfinch			MBCA		T	4
	Sturnus vulgaris	European Starling			-		T	3, 4
	Tachycineta bicolor	Tree Swallow			MBCA		H	4
	Troglodytes aedon	House Wren			MBCA		T	3, 4
	Turdus migratorius	American Robin			MBCA		T	1, 3, 4
	Vireo gilvus	Warbling Vireo			MBCA		T	1
	Vireo olivaceus	Red-eyed Vireo			MBCA	INT	S	1, 2
	Zenaida macroura	Mourning Dove			MBCA		S	3, 4
Herpetofauna	*Bufo americanus*	American Toad			-	-	-	-

Table 9. Wildlife Species Documented and Breeding Bird Results

Wildlife	Scientific Name	Common Name	SARA[1]	ESA[1]	Legal Status[1]	Other[1]	BBE[2]	Station #[3]
	Pseudacris crucifer	Spring Peeper			-	-	-	-
Mammals	*Tamias striatus*	Eastern Chipmunk			FWCA(P)	-	-	-
	Sciurus carolinensis	Eastern Gray Squirrel			FWCA(G)	-	-	-
	Procyon lotor	Northern Raccoon			FWCA(F)	-	-	-
	Odocoileus virginianus	White-tailed Deer			FWCA(G)	-	-	-
	Sylvilagus floridanus	Eastern Cottontail			FWCA(G)	-	-	-

[1]For definitions of species ranks, refer to Appendix D.
[2]BBE - Breeding Bird Evidence (according to Bird Studies Canada):

Possible Breeding:
H - Species observed in its breeding season in suitable nesting habitat.
S - Singing male present in its breeding season in suitable nesting habitat.

Probable Breeding:
T - Permanent territory presumed through registration of territorial song on at least two days, a week or so apart, at the same place.
A - Agitated behaviour or anxiety calls of an adult.

Confirmed Breeding:
NU - Used nest or egg shell found (occupied or laid within the period of study).
FY - Recently fledged young or downy young, including young incapable of sustained flight.
CF - Adult carrying food for young.
NE - Nest containing eggs.
NY - Nest with young seen or heard.

*Only the greatest confirmation of potential breeding (BBE) is presented for each species when a species was observed at multiple stations.
[3]Breeding Bird Point Count Station.

Significant Wildlife Habitat Technical Guide:
SWH – Area Sensitive Species
INT – Interior Species

Legal Status:
MBCA – Migratory Birds Convention Act
SARA – Species at Risk Act
ESA – Endangered Species Act
FWCA – Fish and Wildlife Conservation Act: (P) Protected species; (G) Game species; (F) Furbearing mammals

Table 10: Amphibian Survey of Study Area and Adjacent Lands

Station	Scientific Name	Common Name	2019	2020	SARA	ESA	Local	Legal Status	Call Level Code
1	*Pseudacris crucifer*	Spring Peeper	x	x					1
*2**	-	-							-
3	*Bufo americanus*	American Toad		x					1

* - No anuran species/individuals documented.

Call Level Codes – Abundance Count (according to Bird Studies Canada):

Call Level One (1) – Individual males can be counted accurately.

Call Level Two (2) - Frogs can be generally counted but calls overlap thus no exact number can be obtained.
Call Level Three (3) - Calls continuous and overlapping, no reasonable estimate of numbers.

Salamanders

A number of wetlands (vernal pools) were identified within the woodland habitat found at the southcentral portion of the study area (in the vicinity of Anuran Survey Station #1; see **Figure 3**). These wetlands (vernal pools) were associated with a drainage feature sourced from agricultural lands to the southwest of the study area. Based on the presence of vernal pools within the cultural woodland, LGL identified the potential for the presence of salamander breeding habitat, specifically Jefferson Salamander (*Ambystoma jeffersonianum*) (see **Section 3.4.7**).

Surveys conducted to assess the suitability of the vernal pools to function as salamander breeding habitat consisted of targeted egg mass surveys, searches for individuals (i.e., in ponded water, within the woodland beneath leaves, etc.), and monitoring of water levels within the ponds. Egg mass surveys included a slow and detailed search through vegetation near the pond edge, as salamanders attach their egg masses to such vegetation. Thorough searches of each pond were conducted to determine the presence/absence of egg masses. Surveys to assess potential for salamanders, specifically Jefferson Salamander habitat were conducted on a number of dates in 2019 and 2020 (see **Table 8**). Results from surveys are presented below.

No salamander or Jefferson Salamanders were detected during LGL's March/April 2019 or 2020 surveys. In terms of overall use of vernal pool habitat by amphibians, only a single Spring Peeper individual was heard calling at Anuran Station #1 in both 2019 and in 2020, and only a single American Toad was heard calling at Anuran Station #3 in 2020. Aquatic habitat associated with Station #1 consist of a series of small vernal pools (Reach 2) which are fed by a small ephemeral stream located further to the east (Reach 1). Aquatic habitat associated with Station #3 consists of a very small thicket swamp inclusion within the woodland habitat. Based on both years of anuran call data and observations of site conditions associated with the vernal pools, these aquatic habitats are expected to provide limited function for breeding amphibians and are not considered suitable to support breeding Jefferson Salamander. Furthermore, no amphibian egg masses from any species were observed in the ponds during the targeted field investigations.

3.4.2.2 Reptiles

A single Eastern Garter Snake (*Thamnophis sirtalis sirtalis*) was observed in 2019. Additional snake species may be expected to use habitats within the study area. No observations of turtle species were made during surveys. Use of the study area by turtle species is expected to be limited, due to the lack of suitable aquatic habitats.

3.4.3 Breeding Bird

Breeding bird surveys were conducted on a number of dates during the 2019 breeding bird season to document breeding bird evidence (BBE) and to characterize the nature, extent and significance of breeding bird usage of the habitats within the study area (see **Table 9**). Breeding bird survey methodology and breeding bird behaviours used as evidence of breeding success were categorized according to the Breeding Bird Atlas five-year surveys organized by Bird Studies Canada (Cadman et al., 2007). Locations of breeding bird point count stations are shown on **Figures 2**.

The study area contained a moderate number of bird species found among several habitat types. The majority of species were located within cultural woodland/meadow communities (BBS Stations 3 and 4), with a moderate number of species identified within forested habitats along the northern portion of the property, below the top of slope (Stations 1 and 2) (see **Figure 2**). No confirmed breeding was observed; however, breeding evidence was obtained for 25 species of birds. Of the 25 bird species, BBE suggestive of probable breeding (presumed territory) was observed for 15 species. The majority of these species exhibiting probable breeding behaviour were found within cultural habitats (meadow, woodland, and thicket) associated with BBS Stations 3 and 4. Six species, Warbling Vireo (*Vireo gilvus*), Black-capped Chickadee (*Poecile atricapillus*), American Crow (*Corvus brachyrhynchos*), Song Sparrow (*Melospiza melodia*), White-breasted Nuthatch (*Sitta carolinensis*), and American Robin (*Turdus migratorius*), displayed probable BBE in forested habitats associated with BBS Stations 1 and 2; however, the five latter species were also recorded at either Station 3 or 4. The remaining 10 species were categorized as possible breeders, based on the BBE recorded (suitable nesting habitat and singing males), but it is likely that several of these species do use the study area for breeding as their preferred nesting habitats were present. Like the probable breeders, these birds utilize a variety of habitats and were also commonly encountered across the study area.

Several Barn Swallow were observed foraging during breeding bird surveys; however, no nests of this species were identified on the subject property. No nests of migratory bird species were identified; however, based on BBE collected (both probable and possible), it is assumed that a number of the migratory bird species observed are breeding within the study area. Species which were most commonly encountered across the study area were generally species associated with open-country, forest, forest edge or highly disturbed habitat types.

A summary of the breeding birds documented in the study area during field investigations is presented above in **Table 9**.

Of the documented bird species, 20 recorded species are protected under the *Migratory Birds Convention Act* (MBCA) and two bird species are protected under the *Fish and Wildlife Conservation Act* (FWCA). Three bird species that are considered area-sensitive and/or interior species according to the *Significant Wildlife Habitat Technical Guide* (MNRF, 2000) were identified within the study area, which include Savannah Sparrow (*Passerculus sanwichensis*), White-breasted Nuthatch, and Red-eyed Vireo (*Vireo olivaceus*) (see **Table 9**). White-breasted

Nuthatch and Red-eyed Vireo were primarily identified within the forested habitat associated with the north tributary and the Credit River north of the property.

3.4.4 Mammal Species

Five mammal species were identified during field investigations in the study area (see **Table 9**). Northern Racoon (*Procyon lotor*) tracks were commonly observed along trail networks, while Eastern Chipmunk (*Tamias striatus*) and Eastern Gray Squirrel (*Sciurus carolinensis*) were typically associated with wooded habitats. White-tailed Deer (*Odocoileus virginianus*) tracks were occasionally noted along trail edges. Eastern Cottontail (*Sylvilagus floridanus*) were regularly observed along trails and woodland edges. None of these species are considered to be at risk federally or provincially, however, these species are afforded protection under the FWCA. The mammal species documented represent an assemblage that readily utilizes human influenced landscapes.

3.4.5 Bat Species

There are currently four bat species regulated as 'Endangered' under the ESA, including Eastern Small-footed Myotis (*Myotis leibii*); Little Brown Myotis (*Myotis lucifugus*); Northern Myotis (*Myotis septentrionalis*); and, Tri-coloured Bat (*Perimyotis subflavus*). The MECP administers the ESA in the province of Ontario. The ESA affords protection for both individuals of these species (subsection 9(1)) and their habitat (subsection 10(1)). Given that species-specific habitat regulations have not yet been developed for SAR bats, habitat is protected according to the general definition provided in the ESA. Specifically, according to section 2(1), the Act protects "an area, on which the species depends, directly or indirectly, to carry on its life processes, including processes such as reproduction, rearing, hibernation, migration or feeding".

The individuals and the habitat are protected under these acts and the distribution of all of these species overlaps the study area (BCI, 2019). The habitat that is important for the survival and recovery of the species are the swarming and hibernation sites, and maternity roosting locations (ECCC 2018, Humphrey 2019, Humphrey 2017).

Maternity roosting habitat has been grouped into three types: treed habitat, buildings, and rock piles. The potential for trees to provide bat maternity roosting habitat changes over time with more mature trees and treed habitats likely providing better quality habitat. Little Brown Myotis and Northern Myotis will use cavities in the trees or exfoliating bark, while Tri-coloured Bat roosts in clumps of leaves in the foliage. Within the study area, many treed habitats occur, and all of these were considered potentially suitable. Little Brown Myotis will frequently use buildings and the other three endangered bat species will use buildings, but far less frequently. They could use any building regardless of building age, structure type or whether it is currently occupied by people. Eastern Small-footed Myotis is a saxicolous (rock-loving) species and will frequently roost in rock piles, talus or crack and crevices in rock outcrops.

A detailed description of potential bat roosting habitat is provided below (**Section 3.4.5.1**).

3.4.5.1 Snag Surveys

To complete the snag survey, LGL followed the protocols as outlined in the document prepared by the MNRF: *Survey Protocol for Species at Risk Bats within Treed Habitats – Little Brown Myotis, Northern Myotis and Tri-Colored Bat* (MNRF April 2017) as suggested by MNRF staff (now MECP) for other projects. A brief summary of the above-mentioned protocol includes the following:

- Surveys should take place during the leaf-off period so that the view of tree cavities, cracks and loose bark etc., is not obscured by foliage;
- Measure the number of suitable snags in each ELC community;
- For smaller ecosites (e.g., <10 ha), snag density (# of snags/ha) can be calculated by dividing the number of snags identified by the total area of the ecosites;
- Map the location of each snag tree and record the UTM location using a GPS unit; and
- Calculate snag density for the ELC ecosite (snags/ha).
  **Given the small size of ELC communities (2.3 ha or less) present onsite, survey plots were not used, rather, identification of snag trees across the entire community was conducted, as per the protocol.*

For the purpose of identifying candidate maternity roosting sites within the study area, appropriately treed vegetation communities were first identified through a review of available ELC information for the project site. Trees within the study area were visually searched for potential cavity or other habitat features (openings, crevices, healed cracks, sloughing or peeling bark) that could support maternity roosting use by bats. Tree sizes were measured by tree calipers/tape measure, and trees 10 cm DBH or over were visually searched for potential cavity habitat. Search areas focused on the areas in the deciduous forest (FOD) and cultural woodland (CUW) habitats. However, deciduous forest communities below the top of slope were not surveyed as no disturbance to these communities is anticipated. Waypoints of potential candidate snags were recorded using a Topcon GRS-1 GPS unit and snag screening data sheet provided in Appendix B of the MRNF 2017 document, were used to record details on tree characteristics. This included tree species, estimated DBH, height class, state of decay, and a description of the cavities observed. State of decay is as defined by Watt and Caceres (1999), where 1 is a live healthy tree and 6 is an old, dead tree with no branches, bark and limited or decaying main stem. Surveys were completed on February 24, March 5, 16, 27 and August 21, 2020. The results of these surveys are presented below.

Results

Snag/cavity tree survey results determined that one of seven ELC ecosites surveyed contained 'high' quality roosting habitat (according to MNRF's definition of >10 snags/hectare) (see **Table 11**). The snag/cavity tree assessment survey suggested that several suitable trees which could provide habitat for SAR bats were identified within the CUW1 community. The remaining ELC ecosites surveyed contained little (1 or 2 snag tree(s) per site), or no suitable habitat for SAR bats. Consequently, surveys have suggested that suitable bat roosting habitat within the study area is very limited and is generally isolated to the CUW1 habitat. Locations of snag trees identified are presented in **Figure 6**.

Table 11: Summary of Snag/Cavity Survey Results

Site ID	Total Size (ha)[1]	Plots Surveyed	Total # Snags	Snag Density/ha	Quality[2]
FOD7	0.33	N/A	1	3.03	-
FOM2	1.15	N/A	2	1.73	-
CUW1	3.55	N/A	40	11.27	High
CUM1-1	2.52	N/A	1	0.39	-
CUT1	0.18	N/A	0	-	-
CUM1-1/CUT1-1	0.39	N/A	2	5.12	-
CUM1-1/CUT1	1.76	N/A	1	1.76	-

[1]Size of entire forested unit examined (in hectares) (as shown on **Figure 1**)
[2]Habitat quality as defined by MNRF 2017

3.4.6 Wildlife Habitat

The property is comprised of a mix of anthropogenic, semi-natural and natural features and the surrounding lands are dominated by residential development. Natural areas are largely associated with woodlands surrounding tributaries of the Credit River.

Along the northern side of the property, largely below the top of slope, fresh dry/moist forest communities are dominant and surround the northern tributary and the Credit River, north of the property.

Most of the property contained cultural meadow, thicket, and woodland communities. These communities were noted to provide potential habitat for open-country bird species. Cultural meadow and manicured habitat were generally associated with residential lands (along Confederation Street) and within areas where ad hoc anthropogenic disturbances regularly occur within the property. Cultural meadows were found to contain a range of wildlife species, with some communities providing nesting habitat for a few bird species.

A number of vernal pools were identified within woodland habitat found at the southcentral portion of the study area (in the vicinity of Anuran Survey Station #1 or Reach 2). These vernal pools were associated with a drainage feature sourced from agricultural lands southwest of the property. The vernal pools were frequently found in dry conditions, contained little aquatic vegetation and minimal documented use by wildlife species. Overall, these aquatic features were found to have limited function as wildlife habitat.

In summary, wildlife and wildlife habitat was found to be distributed across the entire property; however, core wildlife habitat areas were not associated with manicured or disturbed land within residential areas. Cultural meadow and manicured habitat types were found across much of the study area and were found to contain a moderately diverse wildlife assemblage. On the local landscape scale, the natural heritage features associated with woodlands are likely to provide local wildlife movement opportunity and function. Two small watercourse features cross through the study area, containing communities within the valleylands such as cultural

meadow/thicket/woodland, and deciduous and mixed forests. These watercourses provide only seasonal flows, contain little vegetation, and are found within highly anthropogenic settings, limiting their capacity to support wildlife species. Wildlife species identified within the study area are generally considered urban or tolerant of anthropogenic features and disturbance.

3.4.6.1 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) has been identified as a natural heritage area for the purposes of Section 2.1 of the PPS (MMAH, 2020).

The PPS defines wildlife habitat as:

> "areas where plants, animals, and other organisms live, and find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species."

Wildlife habitat is considered significant by the Province where it is:

> "ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System. Criteria for determining significance may be recommended by the Province, but municipal approaches that achieve the same objective may also be used."

SWH Criteria Schedules for Ecoregion 6E (MNRF, 2015) was referenced to identify SWH. The following types of significant wildlife habitat were examined for the potential to occur on the study area:

- Seasonal concentration areas;
- Rare vegetation communities or specialized habitats for wildlife;
- Habitats of species of conservation concern, excluding the habitats of endangered and threatened species; and,
- Animal movement corridors.

Data for ELC and wildlife as presented in **Section 3.3 and Section 3.4** were compiled and assessed according to the criteria outlined in MNRF's Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (2015).

Potential Seasonal Concentration Areas include waterfowl stopover and staging areas (terrestrial), bat maternity colonies, colonially nesting bird breeding habitat (bank and cliff), deer yarding and deer winter congregation areas. The deciduous and mixed forest habitats associated with the Credit River should be considered candidate SWH habitat – Deer Winter Congregation due to connectivity to larger forest habitats. Per the Bat Maternity Colonies criteria for SWH the deciduous and mixed forest habitats within the subject property have potential to be SWH, the remainder of habitat within the subject property does not meet the habitat requirements per the SWH guidelines. Breeding bird surveys completed by LGL did not identify bird species and numbers included in defining criteria for waterfowl stopover/staging areas and colonially nesting bird breeding habitat is not present in the study area.

Based on the botanical survey results there are no rare vegetation communities associated with the study area, as the vegetation communities identified within the study area are considered widespread and common in Ontario and are secure globally.

Specialized Habitats for Wildlife include Bald Eagle and Osprey nesting, foraging and perching habitat, and amphibian breeding habitat (woodlands), none of which was observed in the subject property. The wildlife surveys conducted did not find sufficient indicator species required to meet the criteria of these SWH within the subject lands. The study area contained a modest number of breeding bird species representing several habitat types. LGL observed evidence of breeding amphibians during 2020 anuran surveys. Spring Peeper and American Toad were identified during surveys; this suggests there is potentially suitable amphibian breeding habitat within the study area. However, due to the number of individuals heard during these surveys, the presence of these amphibians does not constitute the presence of SWH. In addition, Habitat for Species of Conservation Concern within the subject property include open country bird breeding habitat and shrub/early successional bird breeding habitat. An indicator species for open country bird breeding habitat (Savannah Sparrow) was observed during breeding bird surveys; however, 2 or more indicator species are required as part of defining criteria and consequently Habitat for Species of Conservation Concern was not documented within the subject property.

Overall, no suitable habitat which meets the confirmed SWH criteria was identified on subject lands due to its disturbed nature, habitat simplicity, function and lack of cover habitat.

3.4.7 Species at Risk

The MECP was contacted on August 3, 2021 to request SAR data. The MECP also provides guidelines to undertake preliminary screening for species at risk (MECP May 2019). LGL staff previously conducted a background review of wildlife occurrence records within the property in accordance with the screening guideline, including the Natural Heritage Information Centre (NHIC) through MNRF mapping online (MNRF 2020). As previously noted in Section 3.2.6, the MNRF 'Make A Map: Natural Heritage Areas' on-line utility does not have a 1 km square for the subject property. A response from MECP was received on October 14, 2021. Wildlife species elemental records within and/or adjacent to the study area included Barn Swallow, Bobolink, Eastern Meadowlark, Wood Thrush, Eastern Wood-pewee and Chimney Swift within and adjacent to the property. Other species considered included species at risk bats.

Given the presence of suitable snags within the property, though it is early successional habitat, and the presence of significant mature woodland on the adjacent property associated with the Credit River, tree removal from within the woodland will be conducted outside of the roosting maternity window to ensure no potential bat habitat is negatively impacted during that time. Direction in the Bat Survey Standards Note 2021 from MECP indicates that for treed habitat (Maternity and Day Roosts):

Avoidance considerations: If a proposed activity will avoid impairing or eliminating the function of habitat for supporting bat life processes (e.g. remove, stub, etc. a small number of potential maternity or day roost trees in treed habitats) but the timing of tree removal will avoid the bat active season (April 1 – September 30 in Southern Ontario / May 1 to August 31 in Northern Ontario), then there is no need to conduct species at risk bat surveys of treed habitats.

Of the 32 wildlife species recorded within the study area, one is regulated under the Ontario ESA and/or the federal SARA. Barn Swallow is regulated as 'Threatened' under the ESA. A search of the Ontario Natural Heritage Information Centre (NHIC) database (MNRF, 2020) did not reveal any records for species at risk previously recorded in the vicinity of the property.

In addition to Barn Swallow, five additional species at risk were identified by LGL as having the potential to exist within the study area based on habitats and vegetation communities present within the study area including four bat species and Jefferson Salamander. Each of these six species with their respective legal status, biological requirements, habitat suitability of the study area, likelihood of presence within the study area and survey results (if completed) are discussed below.

Bats

There are currently four bat species regulated as 'Endangered' under the ESA, including Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-coloured Bat. Natural heritage features found within the study area have the potential to support these bat species. As a result, targeted bat habitat characterization surveys were conducted to determine to suitability of habitats within the study area to support bat species. Results of these surveys are presented in **Section 3.4.5**.

Jefferson Salamander

Jefferson Salamander is regulated federally as 'Endangered' under the SARA and is provincially regulated as 'Threatened' under the Ontario ESA. Effective August 2009, the hybrid population of Jefferson Salamander X Blue-spotted Salamander (where Jefferson genome dominates) is also granted habitat protection under the ESA. *Ontario Regulation 436/09* specifically defines this Jefferson hybrid's habitat within several cities, counties and municipalities which includes the Regional Municipality of Halton. Thorough searches of each pond were conducted to determine the presence/absence of egg masses, as well as for individuals within ponds and the surrounding habitat over a two-year period. No suitable salamander habitat was identified within the subject property.

Barn Swallow

Barn Swallow has been downlisted to 'Special Concern' and is no longer regulated under the ESA. Barn Swallow generally builds mud nests on bridges, walls, ledges and barns (Cadman et al. 2007). Barn Swallow typically forages in open areas such as agricultural lands, meadows or water. Barn Swallows were observed at a single breeding bird station (Station # 4) during breeding bird surveys conducted in 2019 (see **Table 11**). A single structure was noted in the vicinity of the Barn Swallow observation; however, a careful inspection of the structure did not reveal any nest from this species. No other habitat considered suitable for nesting was identified within the study area. Consequently, Barn Swallow use of the study area was limited to several foraging individuals.

3.5 Top of Slope

The top of bank on the subject property was previously staked with CVC staff on June 10, 2014 along the northern and eastern boundaries of the property. The top of slope is illustrated on **Figure 3** (see **Section 3.2.1**).

4. EXISTING REGULATORY POLICIES

The following natural heritage policies were reviewed in the context of the proposed development on the subject property.

4.1 The Provincial Policy Statement

The Provincial Policy Statement or PPS (MMAH, 2020) is issued under Section 3 of the Planning Act. All planning decisions under the Halton Region Official Plan and the Town of Halton Hills Official Plan shall conform with provincial plans and be consistent with the PPS. Section 2.1 contains policies on protecting natural heritage features. The natural heritage policies relevant to this EIR are provided for reference below.

2.1 – Natural Heritage

- Policy 2.1.1 Natural features and areas shall be protected for the long term.
- Policy 2.1.3 Natural heritage systems shall be identified in Ecoregions 6E and 7E recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.
- Policy 2.1.4 Development and site alteration shall not be permitted in: significant wetlands in Ecoregions 5E, 6E and 7E1, and significant coastal wetlands.
- Policy 2.1.5 Development and Site alteration shall not be permitted in:

  b) Significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River)

  d) Significant wildlife habitat

  Unless it has been demonstrated that there will be no negative impacts on natural features or their ecological functions.

- Policy 2.1.7 Development and Site alteration shall not be permitted in habitat of endangered species and threatened species except in accordance with provincial and federal requirements.
- Policy 2.1.8 Development and Site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.15, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

4.2 The Greenbelt Plan

The Greenbelt Plan was established under Section 3 of the *Greenbelt Act*, 2005, and took effect on December 16, 2004. The Greenbelt Plan was updated, and a revised plan was released by the Ministry of Municipal Affairs in 2017. The Greenbelt Plan is comprised of several plan areas including: the Niagara Escarpment Plan area; Oak Ridges Moraine Conservation Plan area; Parkway Belt West Plan area; and, Greenbelt Plan 'Protected Countryside' and 'Urban River Valleys'. The Greenbelt Plan is also comprised of various geographic specific policies that apply to lands within the 'Protected Countryside' designation including the 'Agricultural System', 'Natural Heritage System', and 'Settlement Areas'.

Within the Town of Halton Hills, areas located within the Greenbelt Plan are designated 'Protected Countryside' and within the 'Protected Countryside' there are areas the Greenbelt Plan defines as Natural Heritage System (NHS). The NHS includes areas with the highest concentration of the

most sensitive and/or *significant* natural features and functions and these areas are to be managed as a connected and integrated NHS.

The property is not located within the Greenbelt Plan area. However, the Credit River, north east of the subject property is designated as 'Urban River Valley' under the Greenbelt Plan. Section 6 of the Greenbelt Plan outlines the policies that apply to the 'Urban River Valley' land use designation. Only publicly owned lands are subject to the policies of the 'Urban River Valley' designation. This designation is subject to the applicable Official Plan policies.

4.3 Ontario Endangered Species Act

The purpose of the Ontario *Endangered Species Act, 2007* (ESA 2007) is to protect Ontario's species at risk and their habitats, and to promote the recovery of species that are at risk. Through research and field investigations, species presence/absence and suitability of habitat are assessed. A species included as a Species at Risk in Ontario listed as an extirpated, endangered or threatened species receives protection under Section 9 of the ESA 2007. A species listed as endangered or threatened also receives habitat protection under Section 10 of the ESA 2007. Habitat protection is important to protect and enhance a species' ability to carry out its life processes including reproduction, rearing, hibernation or feeding. A determination of whether a proposed development will contravene subsection 10(1) of the ESA 2007 is required prior to the undertaking. Where impacts to SAR are proposed, mitigation measures or overall benefit must be implemented as determined through Ontario Regulation 242/08 or through permitting under the ESA 2007.

4.4 Halton Region Official Plan

The Halton Region Official Plan is consistent with the PPS policies related to natural heritage and has identified the Region Natural Heritage System (RNHS) consisting of Key Features, linkages, enhancement areas and buffers. The Halton Region Official Plan identifies the valleylands associated with the Credit River at the eastern edge of the subject property as a "Key Feature" of the RNHS.

4.5 Town of Halton Hills Official Plan – The Hamlet of Glen Williams Secondary Plan (GWSP) Scoped Update 2021

The Halton Hills Official Plan designates the community of Glen Williams as a "Hamlet Area' and has prepared an Official Plan Amendment Glen Williams Secondary Plan (GWSP 2005). The Glen Williams Secondary Plan was subsequently updated in 2021 as part of Amendment 44 to the Official Plan of Halton Hills. Schedule H4-1 of the ToHH Official Plan has designated the majority of the subject property as 'Hamlet Residential' with the eastern boundary of the site designated as "Greenlands Categories" including "Supportive" and "Core" greelands.

The GWSP (2020) identifies Core Greelands and Support Greelands as areas designated as having environmental important. THE GWSP designates two categories of Greenlands as follows:

- **Core Greenlands** which are areas that have the natural heritage components that include regulatory floodplains, fish habitat, woodlands within or adjacent to the main valley system of the Credit River; riparian corridors linked to watercourses with fish habitat; provincially significant wetlands; and,

- **Support Greenlands** which are areas that have natural heritage features that may not have specific provincial policy to regulate development. Such areas include woodlands; unevaluated wetlands, steep slopes with minor tributaries of the Credit River.

Section 9.3.2 of the GWSP (2005) states *"development may be permitted in **Supportive Greenlands** areas where an Environmental Implementation Report is completed that illustrates how the environmental function of this area can be protected and improved through actions such as street rehabilitation efforts, reforestation and vegetation planting programs.*

4.6 Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 41/24)

The CVC implements policies to ensure the protection of people and property from environmental hazards such as flooding and steep slopes and the agency also protects the environmental integrity of the Credit River watershed. Credit Valley Conservation policies identify standards that can be used to determine the location and setbacks from features such as watercourses, valleys and ravines, wetlands, woodlands, fish habitat and other significant environmental features. Ontario Regulation 41/24 regulates work taking place within valley and stream corridors, wetlands and associated areas of interference, and the Lake Ontario waterfront. Consequently, any works undertaken within the regulation limit will require a permit from the CVC. The subject property is located partially within the Ontario Regulation 41/24 limit.

5. REFERENCES

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Appendix A – Terms of Reference

159 CONFEDERATION STREET
2312390 ONTARIO INC.
GLEN WILLIAMS, ONTARIO

ENVIRONMENTAL IMPLEMENTATION REPORT
TERMS OF REFERENCE

prepared for

EDEN OAK HOMES
1443 HURONTARIO STREET
MISSISSAUGA, ONTARIO
L5G 3H5

by

LGL LIMITED
environmental research associates

JUNE 2021
LGL PROJECT TA8885

This Terms of Reference (TOR) is provided as a guide for the preparation of an Environmental Implementation Report (EIR) in support of the development application for Rezoning and Plan of Subdivision on the lands associated with 159 Confederation Street, Glen Williams in the Town of Halton Hills. This TOR has been prepared in accordance with the policies of the Glen Williams Secondary Plan, on a tributary basis, and Appendix X7 of the Town of Halton Hills Official Plan. The complexity of the EIR will be dependent on the environmental sensitivity of the Credit River, adjacent watercourses, and existing site conditions. The proponent and its representatives will carry out agency consultation during the preparation of the EIR. Agency consultation includes, but is not limited to:

- Ministry of Environment, Conservation and Parks (MECP);
- Ministry of Natural Resources and Forestry (MNRF);
- Credit Valley Conservation (CVC), as applicable;
- Town of Halton Hills (ToHH); and,
- Region of Halton (RoH).

PURPOSE

The purpose of the EIR is to:

- Ensure the goals and objectives set out in the Scoped Subwatershed Plan for Glen Williams are met when land use changes are planned, while being guided by policy from the Town of Halton Hills, the Region of Halton and the CVC.
- Develop an appropriate plan that works towards achieving targets/objectives that have been set for individual environmental resources.
- Streamline the review and approval processes.
- Collect and provide sufficient detailed data so that the proposed implementation report can be developed.

1.0 EXECUTIVE SUMMARY

A summary at the front of the report will contain a description of the proposed project, existing conditions, environmental effects, and recommendations.

2.0 INTRODUCTION TO PROPOSED LAND USE CHANGES

In this section of the EIR, a general overview of the study site location with a focus on the tributary of concern, the Credit River, will be provided with an overview of the approach and methods including any agency consultation. Section 2.0 will include:

- Study site location;
- Purpose of the report;
- A brief description of the proposed project; and,
- A key map of the study site and area.

3.0 APPROACH METHODOLOGY (BACKGROUND INFORMATION)

This section will include all background data and a list of information sources contacted during the study, approach and methods, dates of when field studies were conducted, and a list of the professionals on the study team.

4.0 EXISTING CONDITIONS AND INITIAL MAPPING

Baseline field investigations will be carried out to define existing natural heritage features, functions, linkages and limits of the natural environmental resources within the study site. Natural heritage mapping will be prepared to illustrate environmental resources, as well as agency and municipal setback requirements (i.e. Fisheries Act, valleyland setbacks, etc.). The Ministry of Natural Resources and Forestry's Natural Heritage Reference Manuals' policies will be reviewed as it pertains to natural heritage features associated with the study site. Field investigations and detailed studies for each discipline will be conducted in accordance with standard protocols. Various sections will include:

- Landform and Soils (Chapman and Putman, 1984).
- Fish and Fish Habitat;
    - Surface Water (Vernal Pools);
    - Fish or fish habitat (direct or indirect);
    - Thermal conditions;
    - Stream Morphology;
    - Headwater Study; and,
    - Top of bank limits.
- Vegetation;
    - Vegetation Communities: the classification of vegetation communities including any wetlands following the Ecological Land Classification for Southern Ontario (Lee et al. 1998). If a wetland is observed on site, it will be assessed by a qualified professional in accordance with the Ontario Wetland Evaluation System and agency criteria. Wetland staking will be undertaken during the growing season, if required;
    - Flora identification to be presented in a Vascular Plant List per vegetation community collecting data over three seasons (spring, summer, fall);
    - Species at Risk presence will be discussed, but locations will not be presented on any EIR figures;
    - Regionally rare, locally rare or uncommon species, and provincially tracked species (S1 to S3) presence;
    - A Significant woodlands assessment will be conducted in accordance with Section 277 of the Region of Halton Official Plan (ROP 2009) to determine whether the woodlands on the subject property are significant;
    - Any wetland identified will be assessed in accordance with Section 276.5 and 268 of the ROP (2009) and,
    - Designated Natural Areas, including but not limited to significant portions of the habitat of threatened or endangered species, valleylands, significant wildlife habitat, Areas of Natural and Scientific Interest (ANSIs), and Environmentally Sensitive Areas (ESAs), etc.
- Wildlife and Wildlife Communities.
- Fauna:
    - Breeding Bird Surveys will be completed over two site visits and will be based on approved protocols
    - Amphibians and Reptiles Surveys; and,
    - Species at Risk.

- Tree Survey;
    - Trees Inventoried; and,
    - Species at Risk.

Prepared mapping will include:

- Regulatory floodplain as per the CVC Flood Plain Management Policies;
- Wetlands, vegetation communities, significant species identified as noted above, significant wildlife habitats (if present, etc.);
- Top of bank, dripline, watercourses and valleylands protection areas, and other ecological considerations;
- Aquatic communities and habitat, and appropriate setbacks; and,
- Stream morphology and channel sensitivity, requirements to allow for natural channel functions (migration, meander belt width, etc.), where required.

5.0 DETAILED STUDIES

Subsequent detailed studies are expected to be undertaken; these include:

- Aquatic resources
    - Headwater Drainage Feature Study: If applicable, the EIR will develop strategies to incorporate watercourses and associated buffers/other natural heritage features into the Regional Natural Heritage System (RNHS).
- Terrestrial and vegetation communities
    - Butternut Health Assessment (will not be provided as part of the EIR);
    - Snag Surveys (Bats); and
    - Tree Inventory and Preservation Plan.

Any additional studies such as hydrogeological, geotechnical and functional servicing investigations, etc., will be undertaken by respected experts. Those reports will be noted in the EIR and will be available under separate cover.

6.0 EXISTING REGULATORY POLICIES

Section 6.0 will include a review of natural heritage regulatory policies applicable to the study area:

- The Provincial Policy Statement;
- The Greenbelt Plan;
- Ontario Endangered Species Act;
- Glen Williams Secondary Plan;
- Halton Region Official Plan;
- Town of Halton Hills Official Plan;
- Glen Williams Integrated Planning Project: Scoped Subwatershed Plan; and,
- CVC applicable polices *(Ontario Regulation 160/06)*.

7.0 DESCRIPTION OF PROPOSED DEVELOPMENT

Section 7.0 will include:

- A description of the proposed land use change and location of the proposed development; and,
- A site location map with the site plan.

8.0 IMPACT ASSESSMENT (Constraints and Opportunities)

The natural heritage components on the study site will be compared to the proposed subdivision plan. A description of potential impacts and best management practices based on the findings of the existing condition, will be completed. This will include how linkages between environmental resources and the functions of the resources, will be affected. Predicted changes in natural heritage features will be included. The impact assessment will address direct and indirect impacts that the proposed undertaking may/will have on the environment. Direct impacts include any disruption or displacement caused by the development footprint. Indirect impacts include those that may/will result from changes in site conditions (e.g., impacts to the root zone of trees within proximity to grading, etc.). A natural heritage constraint map will be prepared.

This section will include analysis of natural features, potential impacts from development and proposed mitigation to conform to policy.

- Fish and Fish Habitat
    - Surface Water (Vernal Pools)
    - Stream Morphology
    - Headwater Drainage Study
    - Thermal conditions
- Vegetation
    - Vegetation and Vegetation Communities
    - Species at Risk
    - Regionally Rare and Provincially Tracked Species
    - Designated Natural Areas Impacts which includes significant wetlands, significant portions of the habitat of threatened or endangered species, significant woodlands or valleylands, significant wildlife habitat, Areas of Natural and Scientific Interest (ANSIs), and Environmentally Sensitive Areas (ESAs), etc.
    - Treed Communities
    - Tree Preservation Plan
- Wildlife and Wildlife Communities
    - Fauna
    - Breeding Birds
    - Amphibians and Reptiles
    - Species at Risk
- Other areas for protection and restoration
    - Buffers
    - Linkages
    - Enhancements
- Top of Bank
- Greenlands
- Grading
- Groundwater Recharge

As previously noted, where technical studies under this section are prepared as separate reports, those reports will be noted in the EIR and will be available under separate cover, including but not limited to hydrogeological, geotechnical and functional servicing investigations. Such studies will be undertaken by respective experienced experts to address impacts to natural features associated with the development, and to identify mitigation to ensure those features will continue to function following construction.

Figures illustrating the results of existing conditions including features for protection, restoration, associated buffers and enhancements, the proposed development plan, etc., will be prepared. Additional features associated with the study site as provided by respective agencies/resources such as the Ministry of the Environment, Conservation and Parks or Land Information Ontario, will be mapped to the extent possible, including significant natural features that are within 120 m of the study site such as:

- Significant wetlands;
- Significant portions of wildlife habitat of threatened or endangered species;
- Significant woodlands or valleylands;
- Areas of Natural and Scientific Interest (ANSIs); and,
- Environmentally Sensitive Areas (ESAs) etc.

9.0 MONITORING

Section 9.0 will include:

- Short-term and Long-term Construction Monitoring.

10.0 REHABILITATION AND RESTORATION

Based on impacts identified, habitat preservation, restoration and/or creation, as well as edge management efforts, will be explored/implemented as part of developing mitigation strategies. Alternative strategies will be discussed/negotiated to maximize the mitigation of negative impacts.

Section 10.0, will contain the following, as required:

- Mitigation and restoration, including but not limited to
    - Edge Management;
- Restoration strategy and plans, and if required potential realignment plans;
- Potential short-term construction impacts;
- Potential long-term impacts;
- Monitoring of planted trees/shrubs;
- Homeowners fact sheet for living near natural areas; and,
- Invasive species management plan.

An explanation of how the proposed development will incorporate the environmental resources into planning/designing of the project development will be provided.

11.0 CONCLUSION AND RECOMMENDATIONS

This section will summarize findings and recommendations related to mitigation strategies and any monitoring related to various aspects of the natural environment that will be assessed through this EIR. Summarized strategies will work toward avoiding and mitigating negative impacts to the portion of the adjacent RNHS affected by the proposed development in accordance with Section 118(2) and 118(3) of the Region of Halton Official Plan.

12.0 REFERENCES

A list of referenced/cited material used as part of the EIR preparation.

APPENDICES

Respective appendices will be provided to present more detailed information not included in the main body of the report. These will include, but not be limited to the following:

- Agency Correspondence;
- Vascular Plant List;
- Acronyms and Definitions of Species Lists;
- Tree Inventory and Preservation Plan;
- Bat Habitat Assessment and Mitigation;
- Homeowner's Fact Sheet;
- Invasive Species Management Plan;
- Environmental targets/objectives table; and, Edge Management Plans, etc.

REPORT

This report will be prepared and submitted to the Town of Halton Hills, the Region of Halton and the CVC for review and approval.

REFERENCES

Credit Valley Conservation Authority. 2013. Ontario Region 160/06- Regulation for Development, Interference with Wetlands and Alterations to shoreline and Watercourses.

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Appendix B – Woodland Technical Memo

LGL Limited
22 Fisher Street, P.O. Box 280
King City, Ontario CANADA L7B 1A6
Tel: (905) 833-1244 Fax: (905) 833-1255
Email: kingcity@lgl.com web: www.lgl.com

Technical Memorandum

To: Ron Reinholt, R.P.F., Halton Region

From: Lisa Catcher, LGL Limited

CC: Romas Kartavicius, Eden Oak Homes
Glenn Wellings, MCIP, RPP, Wellings Planning Consultants Inc.
Robert De Angelis, P.Eng, Condeland Engineering

Date: May 13, 2021

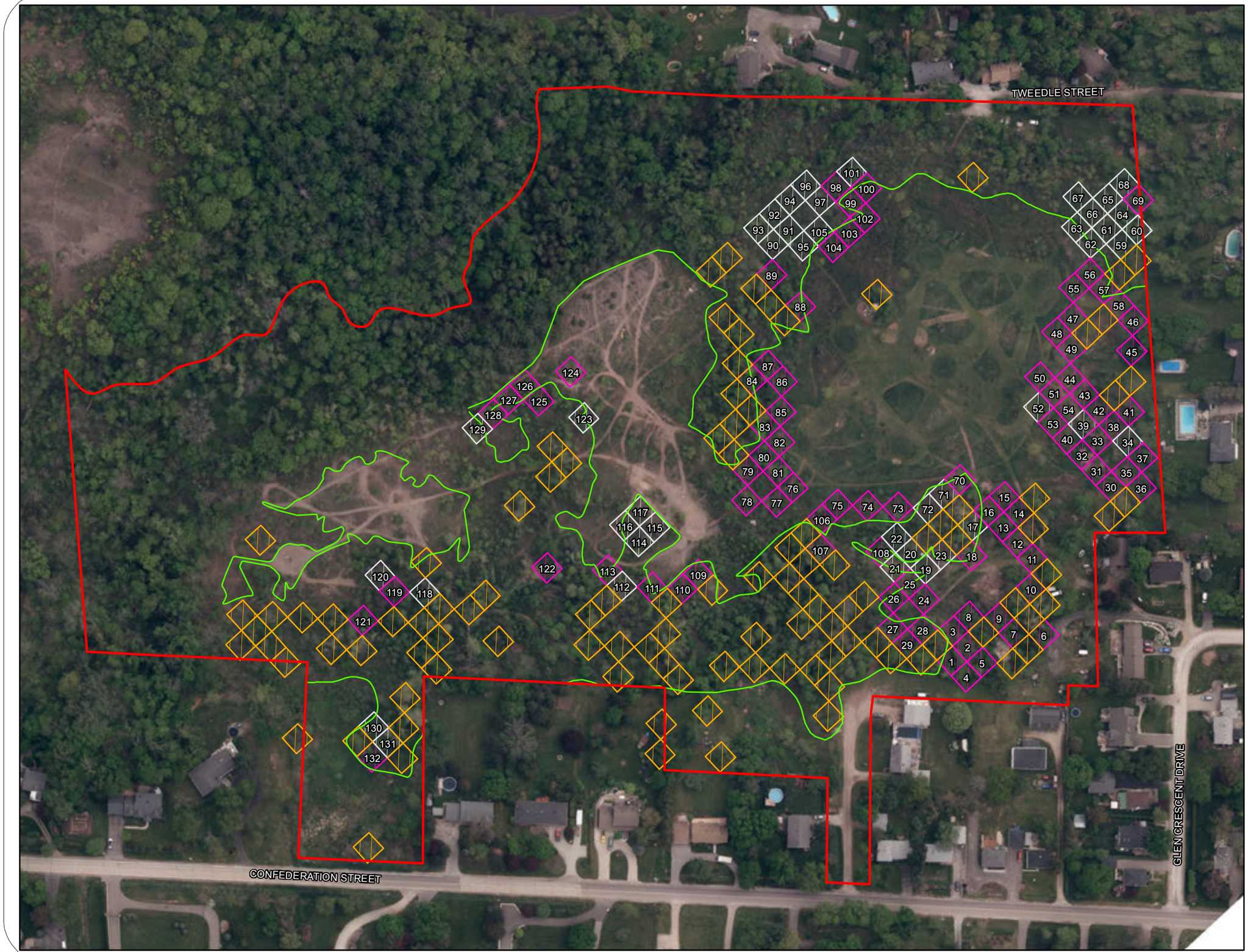
Re: Woodland Staking at 159 Confederation, Glen Williams

1.0 Introduction

As part of the Environmental Implementation Report being prepared for the proposed development at 159 Confederation, Glen Williams, LGL Limited was retained to undertake a woodland dripline staking on the subject property. The dripline of the woodland was delineated in accordance with Halton Region requirements and confirmed in the field with Halton Region staff. The methodology used to determine the dripline is further described in **Section 2.0** and the quality of the woodland habitat is discussed in **Section 3.0**

2.0 Determination of Woodland Boundary Methodology

LGL ecologists undertook an analysis of the treed portion of the subject property to determine the limits and extent of woodland. The analysis was completed by establishing a 10 m x 10 m grid on the subject property. A tree inventory was completed by LGL ISA Certified Arborists in the winter/spring of 2020 which captured all trees 10 cm diameter at breast height (DBH) and greater on the subject property. Based on the tree inventory the 10 m x 10 m squares in the grid on the property that met woodland criteria were excluded from further analysis (**Figure 1**). In areas where tree density was questionable 10 m x 10 m plots were established and all trees (with the exception of those on the Halton Region exclusion list) measuring 1.37 m and greater in height were tallied by size class. Based on the results of the plot tallies it was determined which plots satisfied the criteria for woodland. In addition, in instances where the tree density was not questionable, these areas were assumed to meet the criteria for woodland. The locations of the plots surveyed by LGL are presented on **Figure 1** and the field data from the plot tallies are presented in **Appendix A.** As a result of the plot analysis, the dripline of the woodland was staked at the limit of those plots that met woodland criteria on the subject property. There were several areas where the delineation of the woodland boundary was obvious and did not require a quadrat assessment. Confirmation of the entire woodland dripline staked by LGL staff was undertaken on August 20, 2020 with Halton Region forester, Ron Reinholt and where necessary refinements to the location of stakes was undertaken. In addition, as requested by Halton Region the limits of the offsite portions of the woodland were determined through air



LEGEND

- Property Boundary
- Staked Dripline (confirmed with Halton Region staff August 20, 2020)
- Plot Meets Woodland Criteria Based on Tree Survey
- 10m x 10m Surveyed Grid - Meets Woodland Criteria
- 10m x 10m Surveyed Grid - Does Not Meet Woodland Criteria

Data Sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry (LIO) & Condeland Engineering. Contains information licenced under the Open Government Licence - Ontario.

0 20 40 60 80 m

WOODLAND CRITERIA

LGL LIMITED
environmental research associates

Project	TA8885	**Figure**	1
Date	February, 2021	**Prepared By:**	JJP
Scale	1:1,700	**Verified By:**	NMF

LEGEND

- Contiguous Woodland Habitat (identified through airphoto interpretation)
- Staked Dripline (confirmed with Halton Region staff August 20, 2020)
- Property Boundary

Data Sources: Ministry of Natural Resources and Forestry (LIO) & Condeland Engineering. Contains information licenced under the Open Government Licence - Ontario.

0 20 40 60 80
m

N

WOODLAND DELINEATION

LGL LIMITED
environmental research associates

Project	TA8885	**Figure**	2
Date	February, 2021	**Prepared By:**	JJP
Scale	1:1,700	**Verified By:**	NMF

photo interpretation. The dripline of the woodland that was established in consultation with Halton Region is presented on **Figure 2**.

3.0 Woodland Quality

The overall quality of the woodland on the subject property is considered to be of low to moderate quality. Generally, the woodland supports a high proportion of invasive plant species, low diversity of native plant species, and a large number of the trees are considered to be in fair to poor condition. A high proportion of the trees within the woodland community are showing signs of decline including crown dieback, pests, diseases and poor structure (i.e., broken limbs and weak unions). A number of butternut (*Juglans cinerea*) were identified within the subject property, with a large proportion located within the western portion of the woodland. Evidence of disturbance is prevalent throughout the woodland including informal trails, dumping, significant amount of woody debris and a high proportion of non-native and invasive plant species.

Southern Portion of the Woodland

The southern portion of the woodland is largely comprised of Manitoba maple (*Acer negundo*), poplar species (*Populus* spp.) and ash species (*Fraxinus americana* and *F. pennslyanica*) with occasional elm (*Ulmus* spp.). The understory of this portion of the woodland is dominated by Manitoba maple and common buckthorn (*Rhamnus catharica*), while the ground layer is dominated by non-native plant species. A high proportion of the trees in this portion of the woodlot are in decline showing various signs of stress and crown dieback. Emerald Ash Borer is widespread throughout the ash trees resulting in the decline of the trees. In addition, a number of the poplar trees are displaying signs of hypoxylon canker. Evidence of regeneration is limited and not prevalent throughout this portion of the woodland. The northern edge of the south portion of the woodland is early successional and dominated by young poplar species.

Evidence of disturbance is widespread throughout the southern portion of the woodland including informal trails and encroachment. A number of *ad hoc* paths crisscross this portion of the woodland including trails from ATVs and dirt bikes. Disturbance associated with encroachment from neighbouring properties in the southern portion of the woodland includes tree/shrub removals, dumping and has aided in the establishment of garden variety plant species within the woodland.

Northern Portion of the Woodland

The north west portion of the woodland is early successional and dominated by rhizomatous poplar species. Many of these trees measure 1 cm or less in diameter at breast height and marginally met the height requirement to be included in the woodlot plot analysis. This portion of the woodland is regularly disturbed by the dirt bike trails that have been established. The species composition of the north eastern portion of the woodland is similar to the southern portion of the woodland and is largely dominated by Manitoba maple, black walnut (*Juglans nigra*), and ash species. Tree health in the north eastern portion of the woodlot is good with the exception of ash trees which are in decline as a result of Emerald Ash Borer. Regeneration within this portion of the woodlot is limited and largely consists of young poplar and black walnut. Dumping is prevalent throughout the northern portion of the woodland including debris from pervious land uses on the subject property. Encroachment within the northern portion of the woodland is extensive including a golf course that appears to have been developed by local residents.

4.0 Conclusion

The dripline of the woodland on the subject property was staked and confirmed with Halton Region staff in August 2020 and presented on **Figure 2**, however, the quality of woodland habitat is considered to be low to moderate as described in **Section 3.0**.

Appendix A. Tree Plot Tallies

Project: TA8885
Client: Eden Oak Homes
Collectors: LMC, JJP, NMF

Date: May 1, 7, 8 and 12, 2020
Area: 159 Confederation Street, Glen Williams

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennslyvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 1	≤5			1																				1	No
	>5 ≤12																							0	
	>12 ≤20	1																						1	
	>20																							0	
Plot 2	≤5	1			2																			3	No
	>5 ≤12				1																			1	
	>12 ≤20				1																			1	
	>20																							0	
Plot 3	≤5				1	1																		2	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 4	≤5	1																						1	No
	>5 ≤12	1						1																2	
	>12 ≤20	1					1																	2	
	>20	1																						1	
Plot 5	≤5	1				1																		2	No
	>5 ≤12	2																						2	
	>12 ≤20																							0	
	>20																							0	
Plot 6	≤5																							0	No
	>5 ≤12	2								1														3	
	>12 ≤20								1															1	
	>20																							0	
Plot 7	≤5	1																						1	No
	>5 ≤12	1						1																2	
	>12 ≤20							1																1	
	>20	1																						1	
Plot 8	≤5																							0	No
	>5 ≤12	2																						2	
	>12 ≤20	1																						1	
	>20																							0	
Plot 9	≤5																							0	No
	>5 ≤12				1																			1	
	>12 ≤20	1																						1	
	>20																							0	
Plot 10	≤5										1													1	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 11	≤5																							0	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	
Plot 12	≤5				1																			1	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 13	≤5							1																1	No
	>5 ≤12				1																			1	
	>12 ≤20							2																2	
	>20	1																						1	
Plot 14	≤5																							0	No
	>5 ≤12				1																			1	
	>12 ≤20											1												1	
	>20																							0	
Plot 15	≤5												1											1	No
	>5 ≤12				3																			3	
	>12 ≤20																							0	
	>20																							0	
Plot 16	≤5			1	3					1														5	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennsylvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 17	≤5									12			1											13	Yes
	>5 ≤12									4														4	
	>12 ≤20									2														2	
	>20																							0	
Plot 18	≤5																							0	No
	>5 ≤12	2								3														5	
	>12 ≤20																							0	
	>20																							0	
Plot 19	≤5									4														4	Yes
	>5 ≤12									5														5	
	>12 ≤20																							0	
	>20																							0	
Plot 20	≤5	3								37				3										43	Yes
	>5 ≤12			1				1																2	
	>12 ≤20																							0	
	>20									1														1	
Plot 21	≤5									25														25	Yes
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 22	≤5									11														11	Yes
	>5 ≤12			1				2																3	
	>12 ≤20							1		1														2	
	>20																							0	
Plot 23	≤5	1								32														33	Yes
	>5 ≤12	1																						1	
	>12 ≤20																							0	
	>20																							0	
Plot 24	≤5				1																			1	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 25	≤5									1														1	No
	>5 ≤12				1					1														2	
	>12 ≤20																							0	
	>20																							0	
Plot 26	≤5				3																			3	No
	>5 ≤12	1		1																				2	
	>12 ≤20																							0	
	>20																							0	
Plot 27	≤5																							0	No
	>5 ≤12				1																			1	
	>12 ≤20							2																2	
	>20																							0	
Plot 28	≤5				1																			1	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20	1																						1	
Plot 29	≤5	1		1																				2	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20	1																						1	
Plot 30	≤5				1																			1	No
	>5 ≤12																							0	
	>12 ≤20				1																			1	
	>20																							0	
Plot 31	≤5																							0	No
	>5 ≤12				2						1													3	
	>12 ≤20				2																			2	
	>20																							0	
Plot 32	≤5				2						1													3	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 33	≤5				3																			3	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennsylvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 34	≤5				2						1													3	Yes
	>5 ≤12			1	4																			5	
	>12 ≤20				2																			2	
	>20																							0	
Plot 35	≤5				2																			2	No
	>5 ≤12				2																			2	
	>12 ≤20																							0	
	>20			1																				1	
Plot 36	≤5				1																			1	No
	>5 ≤12				1																			1	
	>12 ≤20				1																			1	
	>20																							0	
Plot 37	≤5				1																			1	No
	>5 ≤12				2																			2	
	>12 ≤20				2																			2	
	>20																							0	
Plot 38	≤5																							0	No
	>5 ≤12				2																			2	
	>12 ≤20				1																			1	
	>20																							0	
Plot 39	≤5				5	1																		6	Yes
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	
Plot 40	≤5																							0	No
	>5 ≤12				2																			2	
	>12 ≤20			1																				1	
	>20																							0	
Plot 41	≤5			2																				2	No
	>5 ≤12				2										1									3	
	>12 ≤20				2																			2	
	>20				1																			1	
Plot 42	≤5				1	1																		2	No
	>5 ≤12				2																			2	
	>12 ≤20																							0	
	>20																							0	
Plot 43	≤5																							0	No
	>5 ≤12			2	1																			3	
	>12 ≤20																							0	
	>20																							0	
Plot 44	≤5				1																			1	No
	>5 ≤12				6																			6	
	>12 ≤20																							0	
	>20																							0	
Plot 45	≤5	1						1																2	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 46	≤5	2			1																			3	No
	>5 ≤12	2																						2	
	>12 ≤20																							0	
	>20				1																			1	
Plot 47	≤5				6																			6	No
	>5 ≤12				1																			1	
	>12 ≤20			1																				1	
	>20																							0	
Plot 48	≤5				4																			4	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 49	≤5				2																			2	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	
Plot 50	≤5				2																			2	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennslyvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 51	≤5			1	2																			3	No
	>5 ≤12				2																			2	
	>12 ≤20				1																			1	
	>20																							0	
Plot 52	≤5									12														12	Yes
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 53	≤5																							0	No
	>5 ≤12					1																		1	
	>12 ≤20																							0	
	>20																							0	
Plot 54	≤5				3	1																		4	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 55	≤5																							0	No
	>5 ≤12			1																				1	
	>12 ≤20																							0	
	>20																							0	
Plot 56	≤5																							0	No
	>5 ≤12	1													1									2	
	>12 ≤20																							0	
	>20																							0	
Plot 57	≤5			1																				1	No
	>5 ≤12			1	2											2								5	
	>12 ≤20				1																			1	
	>20																							0	
Plot 58	≤5																							0	No
	>5 ≤12															1								1	
	>12 ≤20																							0	
	>20																							0	
Plot 59	≤5	2		2	1																			5	Yes
	>5 ≤12	1		2	1			1																5	
	>12 ≤20			1																				1	
	>20																							0	
Plot 60	≤5			3		1																		4	Yes
	>5 ≤12			2																				2	
	>12 ≤20					2		1																3	
	>20																							0	
Plot 61	≤5	1		6																				7	Yes
	>5 ≤12				2																			2	
	>12 ≤20			1																				1	
	>20																							0	
Plot 62	≤5	1		3	5	2																		11	Yes
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	
Plot 63	≤5	2		6	6																			14	Yes
	>5 ≤12			1	1																			2	
	>12 ≤20																							0	
	>20																							0	
Plot 64	≤5			7	1	3																		11	Yes
	>5 ≤12			2																				2	
	>12 ≤20																							0	
	>20																							0	
Plot 65	≤5			14	2																			16	Yes
	>5 ≤12			5	2																			7	
	>12 ≤20																							0	
	>20																							0	
Plot 66	≤5			7	2																			9	Yes
	>5 ≤12			3	3																			6	
	>12 ≤20																							0	
	>20																							0	
Plot 67	≤5			11	1						1													13	Yes
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennsylvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 68	≤5			15																				15	Yes
	>5 ≤12			2																				2	
	>12 ≤20			1							1													2	
	>20																							0	
Plot 69	≤5			1																				1	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20				1																			1	
Plot 70	≤5									2														2	No
	>5 ≤12									2														2	
	>12 ≤20																							0	
	>20																							0	
Plot 71	≤5									6														6	Yes
	>5 ≤12	1								5														6	
	>12 ≤20																							0	
	>20																							0	
Plot 72	≤5				4					20														24	Yes
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 73	≤5				1		1			2														4	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 74	≤5			2																				2	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 75	≤5				2																			2	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	
Plot 76	≤5				2																			2	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 77	≤5			2																				2	No
	>5 ≤12			2																				2	
	>12 ≤20																							0	
	>20																							0	
Plot 78	≤5				1																			1	No
	>5 ≤12	1																						1	
	>12 ≤20	1																						1	
	>20																							0	
Plot 79	≤5										3						1							4	No
	>5 ≤12																							0	
	>12 ≤20				1																			1	
	>20	1																						1	
Plot 80	≤5			1	1																			2	No
	>5 ≤12			2	1																			3	
	>12 ≤20							1																1	
	>20	1																						1	
Plot 81	≤5			2	1																			3	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 82	≤5			2																				2	No
	>5 ≤12			1	1																			2	
	>12 ≤20																							0	
	>20																							0	
Plot 83	≤5			4	3																			7	No
	>5 ≤12			2																				2	
	>12 ≤20																							0	
	>20																							0	
Plot 84	≤5																							0	No
	>5 ≤12	1																						1	
	>12 ≤20																							0	
	>20	1																						1	

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennslyvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 85	≤5				1																			1	No
	>5 ≤12	1		1																				2	
	>12 ≤20																							0	
	>20																							0	
Plot 86	≤5				3																			3	No
	>5 ≤12																							0	
	>12 ≤20				1																			1	
	>20																							0	
Plot 87	≤5																							0	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 88	≤5	1																						1	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20	1																						1	
Plot 89	≤5	6																						6	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 90	≤5	13		1	2																			16	Yes
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 91	≤5	2		5																				7	Yes
	>5 ≤12			1	3																			4	
	>12 ≤20																							0	
	>20																							0	
Plot 92	≤5			6	5																			11	Yes
	>5 ≤12				2																			2	
	>12 ≤20																							0	
	>20																							0	
Plot 93	≤5	3		5	1																			9	Yes
	>5 ≤12				1																			1	
	>12 ≤20				3																			3	
	>20			1																				1	
Plot 94	≤5			3	5																			8	Yes
	>5 ≤12				4																			4	
	>12 ≤20																							0	
	>20																							0	
Plot 95	≤5	5		6	3																			14	Yes
	>5 ≤12				1																			1	
	>12 ≤20				1																			1	
	>20																							0	
Plot 96	≤5			2	2																			4	Yes
	>5 ≤12			6	3																			9	
	>12 ≤20				1																			1	
	>20																							0	
Plot 97	≤5			2	4																			6	Yes
	>5 ≤12				4																			4	
	>12 ≤20				1																			1	
	>20																							0	
Plot 98	≤5			6																				6	No
	>5 ≤12				2																			2	
	>12 ≤20				1																			1	
	>20																							`	
Plot 99	≤5																							0	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20				1																			1	
Plot 100	≤5			1	1						1													3	No
	>5 ≤12				1						1													2	
	>12 ≤20																							0	
	>20																							0	
Plot 101	≤5			5	2																			7	Yes
	>5 ≤12			2																				2	
	>12 ≤20																							0	
	>20																	1						1	

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennsylvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 102	≤5				1																			1	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	
Plot 103	≤5			4	2																			6	No
	>5 ≤12				1																			1	
	>12 ≤20																							0	
	>20																							0	
Plot 104	≤5			5	2																			7	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 105	≤5			3	3	7																		13	Yes
	>5 ≤12			1																				1	
	>12 ≤20																							0	
	>20																							0	
Plot 106	≤5				1						1													2	No
	>5 ≤12																							0	
	>12 ≤20																							0	
	>20																							0	
Plot 107	≤5				1						2													3	No
	>5 ≤12	1						1									1							3	
	>12 ≤20				1																			1	
	>20																							0	
Plot 108	≤5	1						1		3									1					6	No
	>5 ≤12									1														1	
	>12 ≤20																							0	
	>20																							0	
Plot 109	≤5										1									1				2	No
	>5 ≤12	4																						4	
	>12 ≤20																							0	
	>20	1																						1	
Plot 110	≤5	2																						2	No
	>5 ≤12	2			1																			3	
	>12 ≤20																							0	
	>20																							0	
Plot 111	≤5																							0	No
	>5 ≤12	3																						3	
	>12 ≤20	2																						2	
	>20																							0	
Plot 112	≤5	2		5	1																			8	Yes
	>5 ≤12	4			1																			5	
	>12 ≤20	1																						1	
	>20																							0	
Plot 113	≤5	1		3				1																5	No
	>5 ≤12	1			1			1																3	
	>12 ≤20																							0	
	>20																							0	
Plot 114	≤5	1								21														22	Yes
	>5 ≤12	1																						1	
	>12 ≤20	1								1														2	
	>20																							0	
Plot 115	≤5			1		2	6			7				4			1				1			22	Yes
	>5 ≤12	2								1				1										4	
	>12 ≤20																							0	
	>20																							0	
Plot 116	≤5						12							5							3			20	Yes
	>5 ≤12						4							1										5	
	>12 ≤20																							0	
	>20																							0	
Plot 117	≤5			1			7														12			20	Yes
	>5 ≤12																				2			2	
	>12 ≤20						1																	1	
	>20																							0	
Plot 118	≤5			7																		2		9	Yes
	>5 ≤12			2						1														3	
	>12 ≤20																					1		1	
	>20																							0	

	Tree Size Class (dbh)	Number of Trees Identified at 159 Confederation Street																						Total Number of Trees	Plot meets Woodland Criteria (Yes/No)
		Acer negundo	Pinus sylvestris	Fraxinus pennslyvanica	Juglans nigra	Prunus sp.	Pinus sylvestris	Ulmus americana	Ulmus sp.	Populus tremuloides	Juglans cinerea	Ulmus rubra	Juniperus virginiana	Betula papyrifera	Acer platanoides	Tilia americana	Acer saccharum	Pinus strobus	Quercus macrocarpa	Picea glauca	Thuja occidentalis	Salix alba	Fraxinus americana		
Plot 119	≤5																							0	No
	>5 ≤12			2																				2	
	>12 ≤20									1														1	
	>20																							0	
Plot 120	≤5																							0	Yes
	>5 ≤12	3																						3	
	>12 ≤20																							0	
	>20									1														1	
Plot 121	≤5	1		3																				4	No
	>5 ≤12			1													1							2	
	>12 ≤20																							0	
	>20																							0	
Plot 122	≤5			1				1																2	No
	>5 ≤12									1														1	
	>12 ≤20																							0	
	>20																							0	
Plot 123	≤5	1								21														22	Yes
	>5 ≤12																							0	
	>12 ≤20																1							1	
	>20																							0	
Plot 124	≤5	1												1							1			3	No
	>5 ≤12	2												1										3	
	>12 ≤20																							0	
	>20																							0	
Plot 125	≤5				1																			1	No
	>5 ≤12	5															2							7	
	>12 ≤20																							0	
	>20																							0	
Plot 126	≤5																							0	No
	>5 ≤12	2			1																			3	
	>12 ≤20	2																						2	
	>20																							0	
Plot 127	≤5			1	2	1																		4	No
	>5 ≤12				1																			1	
	>12 ≤20				1																			1	
	>20																							0	
Plot 128	≤5			2																				2	No
	>5 ≤12	1			2																			3	
	>12 ≤20																							0	
	>20																							0	
Plot 129	≤5				3					11				6				1						21	Yes
	>5 ≤12									1				1										2	
	>12 ≤20													1										1	
	>20									1														1	
Plot 130	≤5	1		5						2														8	Yes
	>5 ≤12																1							1	
	>12 ≤20																							0	
	>20									1														1	
Plot 131	≤5																1						4	5	Yes
	>5 ≤12										1						1							2	
	>12 ≤20																							0	
	>20							1						2			1							4	
Plot 132	≤5																							0	No
	>5 ≤12				2																		4	6	
	>12 ≤20																						2	2	
	>20																							0	

Appendix C – Vascular Plant List

Appendix C.
Vascular Plant List

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	CVC	FOM2	FOD7	FOD6-5	FOD6-3	CUW1	CUT1-1/CUT1	CUT1	CUM1-1/CUT1-1	CUM1-1/CUT1	CUM1-1	M
	EQUISETACEAE	**HORSETAIL FAMILY**																
	Equisetum arvense	field horsetail	G5	S5						X					X			
	Equisetum pratense	meadow horsetail	G5	S5			R/L				X							
	THELYPTERIDACEAE	**MARSH FERN**																
	Thelypteris palustris var. pubescens	marsh fern	G5T?	S5						X								
	DRYOPTERIDACEAE	**WOOD FERN FAMILY**																
	Athyrium filix-femina var. angustum	northern lady fern	G5T5	S5				X										
	PINACEAE	**PINE FAMILY**																
	Picea glauca	white spruce	G5	S5			L					X						
	Pinus strobus	eastern white pine	G5	S5				X			X	X	X					X
*	*Pinus sylvestris*	scotch pine	G?	SE5			+	X				X	X			X	X	X
	Tsuga canadensis	eastern hemlock	G5	S5						X	X							
	CUPRESSACEAE	**CEDAR FAMILY**																
	Juniperus communis	common juniper	G5	S5			R/L											X
	Juniperus virginiana	eastern red cedar	G5	S5			R					X	X					
	Thuja occidentalis	eastern white cedar	G5	S5				X			X	X					X	X
	ARISTOLOCHIACEAE	**DUCHMAN'S-PIPE FAMILY**																
	Asarum canadense	wild ginger	G5	S5						X								
	RANUNCULACEAE	**BUTTERCUP FAMILY**																
	Actaea pachypoda	white baneberry	G5	S5						X								
	Actaea rubra	red baneberry	G5	S5				X		X								
	Anemone canadensis	Canada anemone	G5	S5								X						
*	*Ranunculus acris*	tall buttercup	G5	SE5			+			X		X						
	BERBERIDACEAE	**BARBERRY FAMILY**																
*	*Berberis thunbergii*	Japanese barberry	G?	SE5			+	X										
*	*Berberis vulgaris*	common barberry	G?	SE5			+								X			
	Podophyllum peltatum	may-apple	G5	S5						X								
	PAPAVERACEAE	**POPPY FAMILY**																
*	*Chelidonium majus*	celandine	G?	SE5			+									X		
	Sanguinaria canadensis	bloodroot	G5	S5						X		X				X		
	ULMACEAE	**ELM FAMILY**																
	Ulmus americana	white elm	G5?	S5				X		X		X	X		X	X	X	
*	*Ulmus pumila*	Siberian elm	G?	SE3			+		X			X					X	

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	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	CVC	FOM2	FOD7	FOD6-5	FOD6-3	CUW1	CUT1-1/CUT1	CUT1	CUM1-1/CUT1-1	CUM1-1/CUT1	CUM1-1	M
	URTICACEAE	**NETTLE FAMILY**																
	Laportea canadensis	wood nettle	G5	S5						X		X						
	JUGLANDACEAE	**WALNUT FAMILY**																
	Juglans cinerea	butternut	G3G4	S3?	END	END		X	X	X		X		X	X	X		
	Juglans nigra	black walnut	G5	S4				X	X	X		X	X	X	X	X	X	X
	FAGACEAE	**BEECH FAMILY**																
	Fagus grandifolia	American beech	G5	S5						X	X							
	Quercus macrocarpa	bur oak	G5	S5				X			X	X					X	
	BETULACEAE	**BIRCH FAMILY**																
	Betula alleghaniensis	yellow birch	G5	S5								X	X					
	Betula papyrifera	white birch	G5	S5				X		X	X	X					X	
	Ostrya virginiana	ironwood	G5	S5						X	X							
	CARYOPHYLLACEAE	**PINK FAMILY**																
*	*Dianthus armeria*	deptford pink	G?	SE5			+					X						
*	*Silene vulgaris*	catchfly	G?	SE5			+					X						
	GUTTIFERAE	**ST. JOHN'S-WORT FAMILY**																
*	*Hypericum perforatum*	common St. John's-wort	G?	SE5			+					X						
	TILIACEAE	**LINDEN FAMILY**																
	Tilia americana	basswood	G5	S5				X	X	X	X				X		X	
	VIOLACEAE	**VIOLET FAMILY**																
	Viola conspersa	American dog violet	G5	S5						X						X		X
	CUCURBITACEAE	**GOURD FAMILY**																
	Echinocystis lobata	prickly cucumber	G5	S5						X			X	X				
	SALICACEAE	**WILLOW FAMILY**																
	Populus balsamifera ssp. balsamifera	balsam poplar	G5T?	S5						X		X	X				X	
	Populus deltoides	cottonwood										X					X	X
	Populus grandidentata	large-tooth aspen	G5	S5									X		X			
	Populus tremuloides	trembling aspen	G5	S5				X		X	X	X	X			X	X	X
*	*Salix alba*	white willow	G5	SE4			+					X						
	Salix discolor	pussy willow	G5	S5								X						
	Salix eriocephala	Missouri willow	G5	S5								X						
*	*Salix fragilis*	crack willow	G?	SE5			+					X						
	Salix sp.	willow		?						X								

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Vascular Plant List

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	CVC	FOM2	FOD7	FOD6-5	FOD6-3	CUW1	CUT1-1/CUT1	CUT1	CUM1-1/CUT1-1	CUM1-1/CUT1	CUM1-1	M
	BRASSICACEAE	**MUSTARD FAMILY**																
*	*Alliaria petiolata*	garlic mustard	G5	SE5			+		X	X		X	X	X	X	X		X
*	*Barbarea vulgaris*	yellow rocket	G?	SE5			+						X					
	Cardamine diphylla	two-leaved toothwort	G5	S5				X		X	X							
*	*Hesperis matronalis*	dame's rocket	G4G5	SE5			+	X	X	X		X	X			X		
*	*Thlaspi arvense*	field penny-cress	G?	SE5			+										X	
	GROSSULARIACEAE	**GOOSEBERRY FAMILY**																
	Ribes americanum	wild black currant	G5	S5					X	X		X						
	Ribes cynosbati	prickly gooseberry	G5	S5				X			X	X			X			
	ROSACEAE	**ROSE FAMILY**																
	Agrimonia gryposepala	tall hairy agrimony	G5	S5				X		x		X	X					
	Amelanchier laevis	smooth juneberry	G4G5Q	S5				X				X	X				X	
	Crataegus punctata	large-fruited thorn	G5	S5				X	X				X					
	Crataegus sp.	hawthorn										X						
	Fragaria virginiana ssp. virginiana	scarlet strawberry	G5T?	SU				X	X			X	X			X		X
	Geum aleppicum	yellow avens	G5	S5				X		X		X	X	X	X	X		
	Geum canadense	white avens	G5	S5				X	X	X		X	X	X	X			
*	*Malus pumila*	common apple	G5	SE5			+	X		X		X	X		X	X	X	
	Potentilla simplex	old-field cinquefoil	G5	S5								X	X				X	X
*	*Prunus avium*	sweet cherry	G?	SE4			+			X								
	Prunus serotina	black cherry	G5	S5				X	X	X	X	X			X	X	X	
	Prunus virginiana var. virginiana	choke cherry	G5T?	S5				X	X	X	X	X	X	X	X	X	X	X
*	*Rosa multiflora*	multiflora rose	G?	SE4			+					X						
	Rubus idaeus ssp. strigosus	wild red raspberry	G5T	S5				X	X	x		X	X		X	X		
	Rubus occidentalis	thimble-berry	G5	S5				X				X	X	X	X			
	FABACEAE	**PEA FAMILY**																
*	*Lotus corniculatus*	bird's-foot trefoil	G?	SE5			+					X				X	X	X
*	*Medicago lupulina*	black medick	G?	SE5			+					X						
*	*Melilotus alba*	white sweet-clover	G?	SE5			+					X	X					
*	*Melilotus officinalis*	yellow sweet-clover	G?	SE5			+								X		X	X
*	*Robinia pseudo-acacia*	black locust	G5	SE5			+					X						
*	*Trifolium pratense*	red clover	G?	SE5			+										X	X
*	*Trifolium repens*	white clover	G?	SE5			+					X			X		X	X

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	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	CVC	FOM2	FOD7	FOD6-5	FOD6-3	CUW1	CUT1-1/CUT1	CUT1	CUM1-1/CUT1-1	CUM1-1/CUT1	CUM1-1	M
*	*Vicia cracca*	tufted vetch	G?	SE5			+					X	X			X		
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**																
	Circaea lutetiana ssp. canadensis	yellowish enchanter's nightshade	G5T5	S5				X	X	X		X						
	CORNACEAE	**DOGWOOD FAMILY**																
	Cornus alternifolia	alternate-leaved dogwood	G5	S5				X	X	X	X	X			X			
	Cornus racemosa	red panicled dogwood	G5?	S5								X	X					
	Cornus rugosa	round-leaved dogwood	G5	S5							X							
	Cornus sericea ssp. sericea	red-osier dogwood	G5	S5								X	X			X		X
	CELASTRACEAE	**STAFF-TREE FAMILY**																
	Euonymus obovata	running strawberry-bush	G5	S5				X										
	EUPHORBIACEAE	**SPURGE FAMILY**																
*	*Euphorbia esula*	leafy spurge	G5	SE5			+									X		
	RHAMNACEAE	**BUCKTHORN FAMILY**																
*	*Rhamnus cathartica*	common buckthorn	G?	SE5			+	X		X	X	X	X	X	X	X	X	
	VITACEAE	**GRAPE FAMILY**																
	Parthenocissus vitacea	inserted Virginia-creeper	G5	S5				X	X	X	X	X	X		X			
	Vitis riparia	riverbank grape	G5	S5			+	X	X	X	X	X	X	X	X	X	X	
	ACERACEAE	**MAPLE FAMILY**																
	Acer negundo	Manitoba maple	G5	S5				X	X	X		X	X	X	X	X	X	X
*	*Acer platanoides*	Norway maple	G?	SE5			+					X				X		
	Acer saccharinum	silver maple	G5	S5													X	
	Acer saccharum var. saccharum	sugar maple	G5T?	S5				X		X	X	X	X	X	X		X	X
	Acer X freemanii	freeman's maple								X		X						
	ANACARDIACEAE	**SUMAC FAMILY**																
	Rhus hirta	staghorn sumac	G5	S5					X	X	X	X	X	X	X	X	X	X
	Toxicodendron radicans ssp. negundo	poison-ivy	G5T	S5				X			X							
	OXALIDACEAE	**WOOD SORREL FAMILY**																
	Oxalis stricta	upright yellow wood-sorrel	G5	S5						X		X	X					
	GERANIACEAE	**GERANIUM FAMILY**																
*	*Geranium robertianum*	herb-robert	G5	SE5						X			X	X	X			
	BALSAMINACEAE	**TOUCH-ME-NOT FAMILY**																
	Impatiens capensis	spotted touch-me-not	G5	S5						X								
*	*Impatiens glandulifera*	glandular touch-me-not	G?	SE4			+		X						X	X		

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	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	CVC	FOM2	FOD7	FOD6-5	FOD6-3	CUW1	CUT1-1/CUT1	CUT1	CUM1-1/CUT1-1	CUM1-1/CUT1	CUM1-1	M
	ARALIACEAE	**GINSENG FAMILY**																
	Aralia nudicaulis	wild sarsaparilla	G5	S5				X	X	X	X							
	APIACEAE	**PARSLEY FAMILY**																
*	*Daucus carota*	wild carrot	G?	SE5			+					X	X		X		X	X
	APOCYNACEAE	**DOGBANE FAMILY**																
*	*Vinca minor*	periwinkle	G?	SE5			+					X						X
	ASCLEPIADACEAE	**MILKWEED FAMILY**																
	Asclepias syriaca	common milkweed	G5	S5													X	X
*	*Cynanchum rossicum*	swallow-wort	G?	SE5			+								X			
	SOLANACEAE	**POTATO FAMILY**																
*	*Solanum dulcamara*	bitter nightshade	G?	SE5			+			X								
	HYDROPHYLLACEAE	**WATER-LEAF FAMILY**																
	Hydrophyllum virginianum	Virginia water-leaf	G5	S5				X	X	X	X	X		X		X		X
	BORAGINACEAE	**BORAGE FAMILY**																
*	*Echium vulgare*	blueweed	G?	SE5			+										X	
*	*Myosotis scorpioides*	mouse-ear scorpion-grass	G5	SE5			+						X					
*	*Symphytum officinale ssp. officinale*	common comfrey		SE5			+						X					
	LAMIACEAE	**MINT FAMILY**																
*	*Lamium purpureum*	purple dead-nettle	G?	SE3			+					X						
*	*Leonurus cardiaca ssp. cardiaca*	common motherwort	G?T?	SE5			+					X	X	X	X	X		
	Mentha arvensis	American wild mint	G5T5	S5						X								
	Prunella vulgaris ssp. lanceolata	heal-all	G5T?	S5						X								
	PLANTAGINACEAE	**PLANTAIN FAMILY**																
*	*Plantago lanceolata*	ribgrass	G5	SE5			+										X	
*	*Plantago major*	common plantain	G5	SE5			+			X		X	X					
	OLEACEAE	**OLIVE FAMILY**																
	Fraxinus americana	white ash	G5	S5					X			X						
	Fraxinus pennsylvanica	red ash	G5	S5				X	X	X	X	X	X		X	X	X	
*	*Syringa vulgaris*	common lilac	G?	SE5			+						X					
	SCROPHULARIACEAE	**FIGWORT FAMILY**																
*	*Linaria vulgaris*	butter-and-eggs	G?	SE5			+								X			
	Penstemon hirsutus	hairy beard-tongue	G4	S4			R/L					X					X	
*	*Verbascum thapsus*	common mullein	G?	SE5			+								X	X	X	X

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Vascular Plant List

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	CVC	FOM2	FOD7	FOD6-5	FOD6-3	CUW1	CUT1-1/CUT1	CUT1	CUM1-1/CUT1-1	CUM1-1/CUT1	CUM1-1	M
	RUBIACEAE	**MADDER FAMILY**																
*	*Galium mollugo*	white bedstraw	G?	SE5			+								X			X
	CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**																
*	*Lonicera tatarica*	Tartarian honeysuckle	G?	SE5			+	X	X	X	X	X	X	X	X	X	X	X
*	*Viburnum lantana*	bending wayfaring-tree	G?	SE2			+					X						
	Viburnum lentago	nannyberry	G5	S5							X							
*	*Viburnum opulus*	guelder rose	G5	SE4			+			X	X							
	DIPSACACEAE	**TEASEL FAMILY**																
*	*Dipsacus fullonum ssp. sylvestris*	wild teasel	G?T?	SE5			+								X			
	ASTERACEAE	**ASTER FAMILY**																
*	*Achillea millefolium var. millefolium*	common yarrow	G5T?	SE?			+					X					X	
*	*Arctium lappa*	great burdock	G?	SE5			+					X		X	X			X
*	*Arctium minus*	common burdock	G?T?	SE5						X			X			X		
*	*Cichorium intybus*	chicory	G?	SE5			+								X	X		
*	*Cirsium arvense*	Canada thistle	G?	SE5			+							X	X		X	
	Erigeron annuus	daisy fleabane	G5	S5						X		X						X
	Erigeron philadelphicus var. philadelphicus	Philadelphia fleabane	G5T?	S5						X		X						
	Eurybia macrophylla	large-leaved aster	G5	S5				X		X	X	X					X	
*	*Hieracium aurantiacum*	devil's paintbrush	G?	SE5			+										X	
*	*Hieracium caespitosum*	field hawkweed		SE5			+					X	X				X	
*	*Leucanthemum vulgare*	ox-eye daisy	G?	SE5			+			X		X	X				X	
	Solidago canadensis	canada goldenrod	G5	S5				X	X			X	X	X	X		X	X
	Solidago flexicaulis	zig-zag goldenrod	G5	S5				X		X	X							
*	*Sonchus arvensis ssp. arvensis*	field sow-thistle	G?T?	SE5			+	X		X			X					
	Symphyotrichum novae-angliae	New England aster	G5	S5						X			X				X	
*	*Taraxacum officinale*	common dandelion	G5	SE5			+			X		X	X	X	X	X	X	X
*	*Tragopogon dubius*	doubtful goat's-beard	G?	SE5			+										X	
*	*Tragopogon pratensis ssp. pratensis*	meadow goat's-beard	G?T?	SE5			+						X				X	
*	*Tussilago farfara*	coltsfoot	G?	SE5			+			X								
	ARACEAE	**ARUM FAMILY**																
	Arisaema triphyllum ssp. triphyllum	small jack-in-the-pulpit	G5T5	S5						X	X							
	CYPERACEAE	**SEDGE FAMILY**																
	Carex pensylvanica	Pennsylvania sedge	G5	S5				X		X								
	Carex rosea	stellate sedge	G5	S5				X		X	X	X						

Appendix C.
Vascular Plant List

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	CVC	FOM2	FOD7	FOD6-5	FOD6-3	CUW1	CUT1-1/CUT1	CUT1	CUM1-1/CUT1-1	CUM1-1/CUT1	CUM1-1	M
	POACEAE	**GRASS FAMILY**																
*	*Bromus inermis ssp. inermis*	awnless brome	G4G5T?	SE5			+					X	X	X	X	X	X	X
*	*Dactylis glomerata*	orchard grass	G?	SE5			+	X		X		X	X				X	
*	*Digitaria sanguinalis*	large crabgrass	G5	SE5			+											X
*	*Elymus repens*	quack grass	G?	SE5			+					X					X	
	Glyceria striata	fowl manna grass	G5	S5						X								
	Phalaris arundinacea	reed canary grass	G5	S5									X	X	X	X		
*	*Phleum pratense*	timothy	G?	SE5			+					X	X					
	Poa pratensis ssp. pratensis	Kentucky bluegrass	G5T	S5								X	X	X	X	X	X	X
	LILIACEAE	**LILY FAMILY**																
*	*Convallaria majalis*	lily-of-the-valley	G5	SE5			+	X	X							X		
	Erythronium americanum ssp. americanum	yellow dog's-tooth violet	G5T5	S5				X	X	X	X	X	X		X			
	Maianthemum canadense	wild lily-of-the-valley	G5	S5				X	X	X	X							
	Maianthemum stellatum	star-flowered Solomon’s seal	G5	S5				X	X		X							
	Trillium grandiflorum	white trillium	G5	S5						X	X							
	IRIDACEAE	**IRIS FAMILY**																
*	*Iris ensata*	Kaempfer's iris	G	SE1			+											X

x – indicates presence/* - indicates non-native

Appendix D – Acronyms and Definitions

APPENDIX D
ACRONYMS AND DEFINITIONS USED IN SPECIES LISTS

Species Rank

GRANK	**Global Rank**
Global ranks are assigned by a consensus of the network of Conservation Data Centres, scientific experts, and The Nature Conservatory to designate a rarity rank based on the range-wide status of a species, subspecies or variety. The most important factors considered in assigning global ranks are the total number of known, extant sites world-wide, and the degree to which they are potentially or actively threatened with destruction. Other criteria include the number of known populations considered to be securely protected, the size of the various populations, and the ability of the taxon to persist at its known sites. The taxonomic distinctness of each taxon has also been considered. Hybrids, introduced species, and taxonomically dubious species, subspecies and varieties have not been included.	
Short Form	**Definition**
G1	**Extremely rare;** usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2	**Very rare;** usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
G3	**Rare to uncommon**; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4	**Common**; usually more than 100 occurrences; usually not susceptible to immediate threats.
G5	**Very common**; demonstrably secure under present conditions.
GH	Historic, no records in the past 20 years.
GU	Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.
GX	Globally extinct. No recent records despite specific searches.
?	Denotes inexact numeric rank (i.e. G4?).
G	A "G" (or "T") followed by a blank space means that the NHIC has not yet obtained the Global Rank from The Nature Conservancy.
G?	Unranked**,** or, if following a ranking, rank tentatively assigned (e.g. G3?).
Q	Denotes that the taxonomic status of the species, subspecies, or variety is questionable.
T	Denotes that the rank applies to a subspecies or variety.

SRANK	**Provincial Rank**
Provincial (or Sub-national) ranks are used by the Ontario Ministry of Natural Resources Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC evaluates provincial ranks on a continual basis and produces updated lists at least annually.	
Short Form	**Definition**
S1	**Critically Imperiled** in Ontario because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation.
S2	**Imperiled** in Ontario because of rarity due to very restricted range, very few populations (often 20 or fewer occurrences) steep declines or other factors making it very vulnerable to extirpation.
S3	**Vulnerable** in Ontario due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	**Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	**Secure**—Common, widespread, and abundant in Ontario.
SX	**Presumed Extirpated** – Species or community is believed to be extirpated from Ontario.
SH	**Possibly Extirpated** – Species or community occurred historically in Ontario and there is some possibility that it may be rediscovered.
SNR	**Unranked**—Conservation status in Ontario not yet assessed
SU	**Unrankable**—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA	**Not Applicable** —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#	**Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

COSEWIC	**Committee on the Status of Endangered Wildlife in Canada**
The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species that are considered to be at risk in Canada.	
Status	**Definition**
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Not at Risk (NAR)	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

COSSARO/OMNR	Committee on the Status of Species at Risk in Ontario/Ontario Ministry of Natural Resources
The Committee on the Status of Species at Risk in Ontario (COSSARO)/Ontario Ministry of Natural Resources (OMNR) assesses the provincial status of wild species that are considered to be at risk in Ontario.	
Status	**Definition**
Extinct (EXT)	A species that no longer exists anywhere.
Extirpated (EXP)	A species that no longer exists in the wild in Ontario but still occurs elsewhere.
Endangered (Regulated) (END–R)	A species facing imminent extinction or extirpation in Ontario which has be regulated under Ontario's *Endangered Species Act*.
Endangered (END)	A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's *Endangered Species Act*.
Threatened (THR)	A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
Special Concern (SC)	A species with characteristics that make it sensitive to human activities or natural events.
Not at Risk (NAR)	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)	A species for which there is insufficient information for a provincial status recommendation.

Species Status under Federal Legislation

MBCA	Migratory Birds Convention Act
The Canada *Migratory Birds Convention Act* provides for the protection of migratory birds in Canada and the United States. The provisions of this Act are implemented through the Migratory Bird Regulations. Bird species that are regulated under the *Migratory Birds Convention Act* are noted in the applicable species lists.	

SARA	Species at Risk Act
The Canada *Species at Risk Act* provides a framework for actions across Canada to ensure the survival of wildlife species and the protection of our natural heritage. It sets out how to decide which species are a priority for action and what to do to protect a species. It identifies ways governments, organizations and individuals can work together, and it establishes penalties for a failure to obey the law. Regulated species are listed in Schedules 1, 2 and 3 of the Act.	
Schedule 1 SARA (1)	Species that are currently covered under the Act.
Schedule 2 SARA (2)	Species that are endangered or threatened that have not been re-assessed by COSEWIC for inclusion on Schedule 1.
Schedule 3 SARA (3)	Species that are of special concern that have not yet been re-assessed by COSEWIC for inclusion on Schedule 1.

Species Status under Provincial Legislation

ESA	**Endangered Species Act**
The Ontario *Endangered Species Act* provides for the conservation, protection, restoration and propagation of species of fauna and flora of the Province of Ontario that are threatened with extinction. Regulated species are listed in Ontario Regulation 338.	

Schedule No.	**Short Form**	**Status**
Schedule 1 ESA (1)	EXT	The species of flora and fauna listed in Schedule 1 are declared to be threatened with extinction.
Schedule 2 ESA (2)	EXP	The species of flora and fauna listed in Schedule 2 are declared to be extirpated.
Schedule 3 ESA (3)	END	The species of flora and fauna listed in Schedule 3 are declared to be endangered.
Schedule 4 ESA (4)	THR	The species of flora and fauna listed in Schedule 4 are declared to be threatened.
Schedule 5 ESA (5)	SC	The species of flora and fauna listed in Schedule 5 are declared to be special concern.

FWCA	**Fish and Wildlife Conservation Act**
The Ontario *Fish and Wildlife Conservation Act* outlines the restrictions for hunting, trapping and fishing; handling of live wildlife; sale, purchase and transport of wildlife; and, licences that can be secured under the Act. Under Schedules 1 to 11 of the Act, wildlife are grouped for the purpose of regulating these species. These schedules are further defined below. Note: where there is a conflict between this Act and the Ontario *Endangered Species Act*, the provision with the most protection will prevail (s. 2 of the *Fish and Wildlife Conservation Act*).	

Schedule No.	**Short Form**	**Status**
Schedule 1	Furbearing – M	The species of fauna listed in Schedule 1 are declared to be furbearing mammals.
Schedule 2	Game – M	The species of fauna listed in Schedule 2 are declared to be game mammals.
Schedule 3	Game – B	The species of fauna listed in Schedule 3 are declared to be game birds.
Schedule 4	Game – R	The species of fauna listed in Schedule 4 are declared to be game reptiles.
Schedule 5	Game – A	The species of fauna listed in Schedule 5 are declared to be game amphibians.
Schedule 6	Specially Protected – M	The species of fauna listed in Schedule 6 are declared to be specially protected mammals.
Schedule 7	Specially Protected – R	The species of fauna listed in Schedule 7 are declared to be specially protected birds (raptors).
Schedule 8	Specially Protected – B	The species of fauna listed in Schedule 8 are declared to be specially protected birds (other than raptors).
Schedule 9	Specially Protected – R	The species of fauna listed in Schedule 9 are declared to be specially protected reptiles.

FWCA	Fish and Wildlife Conservation Act	
The Ontario *Fish and Wildlife Conservation Act* outlines the restrictions for hunting, trapping and fishing; handling of live wildlife; sale, purchase and transport of wildlife; and, licences that can be secured under the Act. Under Schedules 1 to 11 of the Act, wildlife are grouped for the purpose of regulating these species. These schedules are further defined below. Note: where there is a conflict between this Act and the Ontario *Endangered Species Act*, the provision with the most protection will prevail (s. 2 of the *Fish and Wildlife Conservation Act*).		
Schedule No.	**Short Form**	**Status**
Schedule 10	Specially Protected – A	The species of fauna listed in Schedule 10 are declared to be specially protected amphibians.
Schedule 11	Specially Protected – I	The species of fauna listed in Schedule 11 are declared to be specially protected invertebrates.

Local Species Status

TRCA	Toronto and Region Conservation Authority
The TRCA assigns a level of conservation concern for flora and fauna (L1 to L5) in its watersheds (TRCA 2003). The L Rank is determined based on four factors: local occurrence, population trend, habitat dependence, and sensitivity to development.	
L-Rank	**Definition**
L5	Able to withstand high levels of disturbance; generally secure throughout the jurisdiction, including the urban matrix. May be of very localized concern in highly degraded areas.
L4	Able to withstand some disturbance; generally secure in rural matrix; of concern in urban matrix.
L3	Able to withstand minor disturbance; generally secure in natural matrix; considered to be of regional concern.
L2	Unable to withstand disturbance; some criteria are very limiting factors; generally occur in high-quality natural areas, in natural matrix; probably rare in the TRCA jurisdiction; of concern regionally.
L1	Unable to withstand disturbance; many criteria are limiting factors; generally occur in high-quality natural areas in natural matrix; almost certainly rare in the TRCA jurisdiction; of concern regionally.
LX	Extirpated from our region with remote chance of rediscovery. Presumably highly sensitive.
LH	Hybrid between two native species. Usually not scored unless highly stable and behaves like a species (e.g. *Equisetum x nelsonii*)
L+	Exotic. Not native to TRCA jurisdiction. Includes hybrids between a native species and an exotic
L+?	Origin uncertain or disputed, i.e. may or may not be native.

BSC	Bird Studies Canada
The Bird Studies Canada *Conservation Priorities for the Birds of Southern Ontario* (1999), based on work completed by Bird Studies Canada, the Canadian Wildlife Service and the MNR identifies bird species of high conservation priority. This list was prepared to assist municipalities in identifying significant natural heritage features, through using the information regarding the presence of birds of conservation priority in their municipality.	

Birds of conservation priority have been noted (BSC) in the appropriate species lists.

Local

SWH (Significant Wildlife Habitat)
Indicator species of woodland area-sensitive bird breeding habitat

INT (Interior Forest Species)
Indicator species of interior forest bird breeding habitat

Attachment 4:

Draft Table of Contents, Ecological Restoration/Rewilding, Adaptive Management & Monitoring Plan

Appendix 4

Draft Table of Contents, Ecological Restoration/Rewilding, Adaptive Management & Monitoring Plan

1. Purpose

2. Key Steps

    a. Field Surveys

        i. Map of seed and transplant sources

    b. Staking and Confirmation of Key Locations

        i. Invasive patch removal areas
        ii. Soil amendment treatment areas
        iii. Temporary native plant nursery and grow sheds

    c. Confirmation of Pre-approval Measure Locations

        i. Info signage installation (QR code linked)
        ii. Edge tree and shrub protection areas
        iii. Tree health treatment areas (e.g., pruning, fertilization)
        iv. Priority canopy tree felling marking codes
        v. Woody debris placement areas
        vi. Shallow tillage areas
        vii. Habitat feature location confirmation (i.e., rock piles, bat rocket boxes, reptile hibernacula and basking feature areas)
        viii. Wildfire breaks/mitigation areas

3. Collaborative Refinement of Ecological Restoration/Rewilding Concept Plan

4. Finalization of Staged Implementation Plan

    a. Timeframes/schedules
    b. Citizen science and community involvement
    c. Implementing partner discussions and confirmation
    d. Action implementation and adaptations (as required)

5. Monitoring Program

    a. Restoration indicator identification
    b. Automation and community opportunities
    c. Short term opportunities

6. Reporting Requirements

Note:

This comprehensive and integrated report will be developed collaboratively with the Town and Credit Valley Conservation.

The community will be invited to follow and engaged in this restoration work, most likely through engagement with Credit Valley Conservation.

This project intends to serve as a model for the more collaborative and efficient delivery of positive nature outcomes in association with well planned development.