Environmental Impact Study

444 Citigate Drive

Development Application

November 20, 2022

→ **The Power of Commitment**

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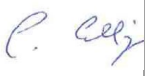
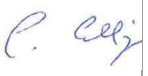
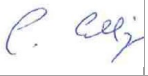
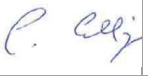
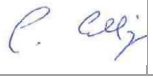
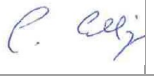
S3	V1	Candice Talbot, Chris Ellingwood	Chris Ellingwood		Chris Ellingwood		June 10, 2022
S3	V2	Candice Talbot, Chris Ellingwood	Chris Ellingwood		Chris Ellingwood		June 16, 2022
S4	V3	Chris Ellingwood	Chris Ellingwood		Chris Ellingwood		Nov. 20, 2022

GHD

347 Pido Road, Unit 29

Peterborough, Ontario K9J 6X7, Canada

T +1 705 749 3317 | **F** +1 705 749 9248 | **E** info-northamerica@ghd.com | **ghd.com**

Executive Summary

GHD was retained by Colonnade BridgePort in 2021 to complete a due diligence study to determine the potential developable area on the subject lands identified at 444 Citigate Drive within the City of Ottawa. The lands currently have a woodland feature that is identified as a Natural Heritage Feature as designated within the City of Ottawa Official Plan.

The next step was to prepare an EIS for the potential development of the industrial uses. This includes construction of large warehouse buildings, driveways and associated parking areas.

Previous reports were reviewed that were conducted by my former company, Niblett Environmental Associates Inc. that contained detailed biological data. In the end, due to substantial changes to the former study area due to recent development, we conducted surveys of just this property and conducted our analyses of the woodland based primarily on those.

The study was completed in three distinct phases. The first phase involved a literature review of existing information and standard sources of biological data including natural heritage mapping. NEA Biologists completed a review of natural heritage databases from OMNRF and obtained the latest information on natural features and Species at Risk.

Our second phase consisted of site visits by our terrestrial/wetland and fisheries biologists through the months of April – June 2022. During these visits new site-specific data was collected to verify the information that had been obtained through the earlier literature reviews, and to confirm wetland and woodland boundaries adjacent to the property. The purpose of the surveys included to:

– Assess the ecological functions of the woodland and delineate its current boundary;
– Delineate wetland boundaries on site and identify whether the features meet the definition of wetland as per the Ontario Wetland Evaluation System (OWES) and Rideau Valley Conservation regulations;
– Identify and map any on-site ponds, creeks, seepage areas and/or other water features;
– Conduct a preliminary assessment of habitat suitability for species at risk;
– Search for significant trees (butternut) and/or rare plants and SAR bat habitat;
– Record incidental observations amphibians, snakes and other wildlife;
– Check for raptor stick nests in the woodland;
– Conduct two in-season breeding bird surveys.
– Confirm woodland community types and botany surveys

The final phase involved preparation of this EIS report, including specific mitigation measures for protecting the wetland, watercourse, sensitive species and other natural features on or adjacent to the study site. This report also includes a figure that illustrates the location of vegetation communities, wildlife survey stations, and the recommended buffers and setbacks and developable area.

Based on an ecological assessment of the current functions, changes that have occurred to the total woodland area, development impacts from adjacent properties and a review of the ecology, we have recommended option 2.

It is my opinion that this remnant woodland on this site falls under the Comparative criteria as per Policy 6.4.1.

The woodland is on private property and is not accessible to the public. There are no established trails in the area that includes this woodland. Multi-use trails are present on the west and south side of Citigate Drive as part of the cycling trail system for commuters and recreational use. These do not enter the woodland. No parks of greenspace lands abut this property.

The ecological functions of this remnant woodland have been impacted by development of the area. This has created an isolated woodland. The functions currently identified are limited and similar to other urban treed areas where development has occurred.

The compensation option recommended (Option 2) has been specifically designed to maintain some of the existing natural features, most of the NHF feature and a representation of the ELC communities present in a block, that will be retained for the long term. This is shown on Figure 2. The 2.97 hectare block will be located outside of the developable area and the road pattern. This will create a rectangular block of natural area.

The recommended block will maintain the wetland community MAM2-1 and the catchment area, as well as the ponded area in this community. Additional native tree plantings are recommended around this wetland community.

The upland area that is currently abandoned pastureland and containing several invasive species, can, with some soil amendments and extensive plantings of native tree and shrub species, become a mixture of successional meadow, shrub thicket, treed swamp and savannah in the long term.

Retaining some of the mature trees (cedar, basswood, willow, sugar maple, ironwood) and a mix of coniferous and deciduous forest within that block will provide a seed source for new seedlings to establish and existing cover. The plantings will be conducted to diversify the forest community and tree species to include typical native species such as eastern white pine, red oak, sugar maple, hackberry and large-toothed aspen.

This will in part retain some of the identified Natural Heritage Feature area that meets the minimum requirements of 0.8 ha in size and having trees over 60 years old (see Figure 2).

The recommended compensation block will maintain the wetland community MAM2-1 and the catchment area, as well as the ponded area in this community with planting of wetland trees along the edge. The upland area that is currently abandoned pastureland and containing several invasive species, can, with some soil amendments and plantings of native tree and nodes of shrubs, will become a mixed community with a diversity of habitats.

Construction impacts can be minimized through detail design and implementation of the recommendations outlined in Sections 5 and 7 of this report. GHD's recommendations have been made to address potential impacts to natural features and/or their functions during the site preparation, construction and post-construction period. Additional discussions with the Rideau Valley Conservation, and the City of Ottawa need to occur to determine the project permitting requirements.

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1. Introduction

1.1 Background

GHD was retained by Colonnade BridgePort in 2021 to complete a due diligence study to determine the potential developable area on the subject lands identified at 444 Citigate Drive within the City of Ottawa. The lands currently have a woodland feature that is identified as a Natural Heritage Feature as designated within the City of Ottawa Official Plan.

Initial contact with the City of Ottawa Ecologist provided some preliminary scoping comments which stated:

> *The new OP no longer identifies the natural feature as an Urban Natural Feature (UNF); however, it is identified as a Natural Heritage Feature in the Schedule C11A. As such, an EIS will need to be conducted to determine the conditions of the natural feature and its ecological functions, and to demonstrate no negative impacts to the natural heritage feature. I would advise to review the new OP policies of the 4.8 and 5.6.4. The natural feature may also contain significant woodlands, which will need to follow the City's Significant Woodlands: Guidelines for Identification, Evaluation and Impact Assessment (see attached). I anticipate the EIS will cover the following:*
>
> – significant wildlife habitat
> – significant woodlands
> – potential significant habitat for threatened or endangered species

The next step was to prepare an EIS for the potential development of the industrial uses. This includes construction of large warehouse buildings, driveways and associated parking areas.

Previous reports were reviewed that were conducted by my former company, Niblett Environmental Associates Inc. that contained detailed biological data. In the end, due to substantial changes to the former study area due to recent development, we conducted surveys of just this property and conducted our analyses of the woodland based primarily on those.

1.2 Location and Study Area

The property is located on the south side of Citigate Drive, immediately to the south of the new Amazon warehouse, and east of Highway 416 in the City of Ottawa.

1.3 Scope and Limitations

This report: has been prepared by GHD for Colonnade BridgePort and may only be used and relied on by Colonnade BridgePort for the purpose agreed between GHD and Colonnade BridgePort as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Colonnade BridgePort arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

1.4 Study Rationale

This section identifies federal, provincial and other regulatory legislation, policies, official plans (OPs) and official plan amendments that are applicable and relevant to the study area and the immediate vicinity. This includes policies that triggered the study. These documents may identify Species at risk, natural features and habitats or other features relevant to this study.

1.4.1 Federal Legislation

1.4.1.1 Migratory Birds Convention Act

The purpose of the Migratory Birds Convention Act (MBCA 1994) is to implement the Convention by protecting and conserving migratory birds as populations, individual birds, and their nests.

No work is permitted to proceed that would result in the destruction of active nests (i.e., nests with eggs or young birds) or the wounding or killing of bird species protected under the MBCA and/or Regulations under that Act.

1.4.2 Provincial Legislation

1.4.2.1 Endangered Species Act, 2007

The purposes of the Ontario Endangered Species Act (ESA 2007) are to:

1. To identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge;
2. To protect species that are at risk and their habitats, and to promote the recovery of species that are at risk;
3. To promote stewardship activities to assist in the protection and recovery of species that are at risk. 2007, c. 6, s. 1. (Government of Ontario, 2019)

The ESA clearly defines the five classifications of species status as extinct, extirpated, endangered, threatened, or special concern, and provides guidelines on the process of species status determination.

Regulations made under this Act include: Ontario Regulation 230/08 and 242/08. Ontario Regulation 230/08 provides the list of Species at Risk (SAR) in Ontario, which is updated regularly. This list was most recently consolidated on August 1, 2018 (Government of Ontario, 2018). Species status provided in the list is assessed by an independent body, the Committee on the Status of Species at Risk in Ontario (COSSARO), based on the best-available science and Aboriginal Traditional Knowledge.

General habitat protection is afforded to all species listed as endangered or threatened. General habitat descriptions are technical, science-based documents that have been developed for some of the species that are most likely to be affected by human activity (Government of Ontario 2020). Further information including a Recovery Strategy or Management Plan is required for each listed species, on a timeline dictated by the species status.

Ontario Regulation 242/08 explains possible exemptions to the ESA and details on how the purpose of the ESA is to be carried out.

1.4.2.2 Provincial Policy Statement, 2020

The Provincial Policy Statement, 2020 (PPS) is the statement of the Ontario government's policies on land use planning. It applies province-wide (in the province of Ontario) and provides provincial policy direction on land use planning. Municipalities use the PPS to develop their official plans and to guide and inform decisions on other planning

matters. The PPS is issued under Section 3 of the Planning Act and all decisions affecting land use planning matters 'shall be consistent with' the Provincial Policy Statement (Government of Ontario, 2020).

Portions of Sections 2.1.4-2.1.8 of the Provincial Policy Statement (PPS 2020) apply to this project.

2.1.4 Development and site alteration shall not be permitted in:

a. significant wetlands in Ecoregions 5E, 6E and 7E1; and

b. significant coastal wetlands.

2.1.5 Development and site alteration shall not be permitted in:

a. significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;

b. significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

c. significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

d. significant wildlife habitat;

e. significant areas of natural and scientific interest; and

f. coastal wetlands in Ecoregions 5E, 6E and 7E1 that are not subject to policy unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

2.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

2.1.7 Development and site alteration shall not be permitted in the habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

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, 2.1.5 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 their ecological functions.

1.4.3 Local and Other Regulatory Bodies

1.4.3.1 City of Ottawa Official Plan

Several sections of the City of Ottawa Official Plan are applicable to this EIS. As the key issue is the woodland on site, the natural heritage policies in section 5.4 are the main policies discussed in this EIS report. Further assessment of the compliance of the applicable OP sections in found in later sections of this report.

1.4.3.2 Rideau Valley Conservation Authority (RVCA) (Ontario Regulation 174/06)

The Conservation Authority whose jurisdiction the study area falls under is the Rideau Valley Conservation Authority. Under the Conservation Authorities Act, Ontario Regulation 174/06, Regulation of Development Interference with Wetlands and Alterations to Shorelines and Watercourses is applicable. Specifically, under this regulation, LTRCA is required to: Prohibit, regulate or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland. Prohibit or regulate or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.

1.5 Other Resources Referenced

Prior to field surveys, background information for the study area and surrounding lands from a variety of sources was reviewed to provide context for the setting and sensitivity of the site. Background information sources included:

1.5.1 Data Sources

- Aerial imagery
- MNRF Land Information Ontario (LIO) database mapping and Natural Heritage Information Centre (NHIC) Make-a-map tool (2021)
- Ontario Breeding Bird Atlas data (Bird Studies Canada, (BSC) 2001-2005 field data)
- Ontario Ministry of Natural Resources, Aquatic Resource Area, Fish Species List (OMNR, 2019)
- Department of Fisheries and Oceans (DFO) Aquatic Species at Risk Mapping (DFO, 2019)

1.5.2 Literature and Resources

- Natural Heritage Reference Manual (MNRF, 2010)
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. Peterborough, 38pp. (OMNRF, 2015)
- City of Ottawa Official Plan (2019)

1.6 Description of Development

The proposed development is to be an industrial park facility with several buildings, driveways, truck/trailer storage and parking areas. The total developable area proposed is approximately 13 acres (Appendix D).

1.6.1 Scope of Report

The scope of work for the project includes the following:

- Description of current and proposed land uses
- Ecological Land Classification (ELC) of all vegetation communities
- Wetland delineation and setbacks;
- Breeding bird surveys (x2)
- Assessment of woodland significance
- Assessment of potential Significant Wildlife Habitat (SWH)
- Species At Risk (SAR) presence and habitat assessment, including habitat of endangered and threatened species
- Analysis of possible impacts of development on the natural features and ecological functions of all significant features identified,
- Mitigation recommendations
- potential compensation options
- Figure illustrating lot layout that respects all significant natural features and buffers/setbacks per EIS recommendations

2. Study Methods

2.1 General Approach

The study was completed in four distinct phases. The first phase involved a literature review of existing information and standard sources of biological data including natural heritage mapping. NEA Biologists completed a review of natural heritage databases from OMNRF and obtained the latest information on natural features and Species at Risk.

Our second phase consisted of site visits by our terrestrial/wetland and fisheries biologists through the months of April – June 2022. During these visits new site-specific data was collected to verify the information that had been obtained through the earlier literature reviews, and to confirm wetland and woodland boundaries adjacent to the property. The purpose of the surveys included to:

– Assess the ecological functions of the woodland and delineate its current boundary;
– Delineate wetland boundaries on site and identify whether the features meet the definition of wetland as per the Ontario Wetland Evaluation System (OWES) and Rideau Valley Conservation regulations;
– Identify and map any on-site ponds, creeks, seepage areas and/or other water features;
– Conduct a preliminary assessment of habitat suitability for species at risk;
– Search for significant trees (butternut) and/or rare plants;
– Record incidental observations amphibians, snakes and other wildlife;
– Check for raptor stick nests in the woodland;
– Conduct two in-season breeding bird surveys.
– Confirm woodland community types and botany surveys

The final phase involved preparation of this EIS report, including specific mitigation measures for protecting the wetland, watercourse, sensitive species and other natural features on or adjacent to the study site. This report also includes a figure that illustrates the location of vegetation communities, wildlife survey stations, and the recommended buffers and setbacks and developable area.

2.2 Study Site Methodology

2.2.1 Physical Site Characteristics

Site characteristics were assessed during field visits. This assessment included general documentation of existing disturbances, current property use, age of vegetation cover, topography and natural features.

2.2.2 Biophysical Inventory

2.2.2.1 Vegetation

ELC Survey Method

All vegetation encountered in the study was inventoried during the site visits. Delineation and classification of the vegetation community types was based on the Ecological Land Classification for Southern Ontario (Lee et al., 1998). General notes on disturbance, topography, soil types, soil moisture and state of each community were also compiled. All vegetation communities in the study area were included.

Rare, significant or uncommon species were searched for. Species significance or rarity on a national, provincial, regional or local level was based on published literature and standard status lists. These included SARA (2021), COSEWIC (2021), SARO (2018), Brunton (2000) and most recent City of Ottawa SAR list (2022) .

2.2.2.2 Birds

Breeding Bird Survey (BBS)

Bird surveys were conducted following the protocols of the Ontario Breeding Bird Atlas (OBBA) point count (Cadman and Kopysh, 2001). Six point count stations were established, with two surveys being conducted at each station during the breeding season. All birds seen or heard within each five-minute station period were documented and breeding evidence codes recorded. Surveys were conducted in the early morning at stations established in a variety of vegetation communities in order to adequately survey birds using all habitats in the study area.

Area Searches

In addition to breeding bird point counts, birds detected while on-site during all other field surveys were recorded along with a breeding evidence code if known. The search area for these surveys included all of the vegetation communities in the study area.

Rare, significant or uncommon species were searched for. Species significance or rarity on a national, provincial, regional or local level was based on published literature and standard status lists. These included SARA (2021), COSEWIC (2021), SARO (2018), and most recent City of Ottawa SAR list (2022).

2.2.2.3 Other Wildlife

While surveyors were on site conducting surveys of vegetation communities (e.g., surveys of vegetation communities) observations of any wildlife encountered on site were recorded (including mammals, amphibians and reptiles). Documentation included notes about the species detected, their location and the type of encounter (i.e., direct sightings and indirect evidence such as calls, tracks, scat, burrows, dens, trails and browse).

Rare, significant or uncommon species were searched for. Species significance or rarity on a national, provincial, regional or local level was based on published literature and standard status lists. These included SARA (2021), COSEWIC (2021), COSSARO (2021), and most recent City of Ottawa SAR list (2022)

2.2.2.4 Wetlands

Wetland boundaries were determined by GHD biologists certified to conduct wetland evaluations under the Ontario Wetland Evaluation System, third edition, version 3.3, southern manual (2014). Biologists first reviewed aerial photographs and available wetland mapping, including MNRF GIS database layers and previous mapping. Subsequently, they walked the entire property, checking plant species, soil type and soil moisture. The boundary of any wetlands was then delineated in the field using a handheld GPS unit.

2.2.2.5 Significant Woodlands

Significant woodlands are a component of the Natural Heritage System in the City of Ottawa's Official Plan. Wooded areas on the site were inventoried while ELC surveying was conducted. An analysis of the woodland in terms of significance was assessed based on City of Ottawa guidelines.

2.2.2.6 Significant Wildlife Habitat (SWH)

Prior to site visits, a candidate list of SWH features were determined based on the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E, 2015. During site visits, GHD biologists looked for evidence of those candidate significant wildlife habitat features (i.e., to determine presence/absence). Upon compiling field data, further consideration was given to which candidate SWHs could be confirmed as present on the property.

3. Survey Results

The following section presents GHD site-specific survey data only. Supporting information, the background review and other sources of information will be presented and discussed in Section 4.0 – Discussion and Analysis.

3.1 Physical Site Characteristics

The subject property is located in an area that formerly contained woodlands, hayfields and successional old field meadows with numerous fencerows. That area extended from Strandherd Avenue to Cambium Road and west to Highway 416. In the last number of years, much of that area has been developed when Citigate Drive was constructed. As result most of that area is now developed.

The subject site includes an area of forest cover, fencerows, successional forest edge and active agricultural fields (corn previously and soya beans in 2022). The site was mainly forested with coniferous trees and a central patch of deciduous trees and some wetland pockets. The site is lowest on the east side and rises slightly to the west.

The topography is general level but with some areas of gently rolling slopes. The woodland contained silty clay soils but with exposed broken limestone rock and patches of thin soil.

2021 Satellite Imagery

Amazon Warehouse

Costco Wholesale

CITIGATE DRIVE

SYSTEMHOUSE STREET

HIGHWAY 416

Previous Site UNA Removal
5.37 ha

UNA On Site
7.96 ha

FOD6-1
1,647 m²

FOC4-1
9,798 m²

SWM4-1
1,756 m²

FOC4-1
27,732 m²

FOM7-2
11,422 m²

FOD5-1
17,571 m²

CUM1-1
4,256 m²

MAM2-1
309 m²

FOC2-2
2,994 m²

FOC4-1
15,062 m²

City of Ottawa

2019 Orthophotography

Legend

- Site Limit
- Urban Natural Area
- Vegetation Communities
- Wetland Community
- Approx. Natural Heritage Features Overlay (Draft Schedule C11-A-Natural Heritage System (West) City of Ottawa, 2021)

1 cm = 32 meters

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 18N

Paper Size ANSI B

Shane Kozminuk
444 Citigate Drive, Ottawa, ON
City of Ottawa

Due Diligence Study

Natural Features & Constraints

Project No. 12574213
Revision No.
Date Feb 17, 2022

Figure 1

Q:\GIS\PROJECTS\12574000s\12574213\Layouts\202202_RPT001\12574213_202202_RPT001_GIS001 - Natural Features and Constraints.mxd
Print date: 17 Feb 2022 - 10:58

Data source: © City of Ottawa, 2019., © Google, 2021.

3.2 Biological Inventories

3.2.1 Vegetation

3.2.1.1 Level of Effort

The vegetation communities were delineated within the study area by GHD biologists according to methodologies outlined in Section 2.2.2.1. A summary of the level of effort and environmental conditions have been provided in Table 1.

Table 1 Vegetation Surveys - Level of Effort

Survey Date	Survey Type	Weather	Start Time	Effort (person hrs.)
May 12, 2021	Ecological Land Classification (ELC)	15°C, Cloud cover 50%, Beaufort Wind Scale 0, no precipitation	7:30PM	3
June 4, 2021	Ecological Land Classification (ELC)	13°C, Cloud cover 90%, Beaufort Wind Scale 0, no precipitation	6:45 AM	3.5

3.2.1.2 ELC Code Descriptions

Impacts from emerald ash borer and other diseases, wood cutting, blowdown or other natural causes was also examined along with the general health of the woodland, connectivity to adjacent features and wildlife corridors, wildlife use (deer yard) and the ages of the trees in each zone, if any.

The woodland boundary was GPS'd in the field and overlaid on Figure 1 to identify the current extend of the core of the woodland feature (**Figure 1**). The features and functions of the woodlot were confirmed in the field to be similar to those identified in previous reports and literature. Table 1 outlines the literature sources compiled outlining the features and functions of the woodlot on the subject property.

Table 2 Literature review materials related to Subject Land

Report Name	Author	Year	Forest Name	Study Area Boundary
Urban Natural Areas Environmental Evaluation Study Final Report	Muncaster Environmental Planning Inc.	2005	W50	City-wide Study
O'Keefe Drain Woodland Study	GHD (Formerly Niblett Environmental Associates)	2012	NA	Woodlot on Subject lands and to the north

A review of the features and functions of the woodlot will be discussed below:

3.3 Urban Natural Area (UNA 50: Highway 416)

The Urban Natural Area identifies the woodlot on the subject lands as an upland deciduous and coniferous forest. The coniferous community was dominated by eastern white cedar (*Thuja occidentalis*), with a more mature upland deciduous forest type dominated by sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*).

The entire UNA 50 feature was 13.4 ha in size when it was evaluated in 2005, however has since changed in size. The current size of leftover part of the UNA is 7.96 ha (see Figure 1).

This isolated feature contained no interior habitat (greater than 100 m from edge) and was adjacent to active agricultural development and major transportation routes (Highway 416) on the western boundary of the lands. The disturbance level and condition of the woodlot possessed low native species with evidence of previous tree cutting, old cattle grazing, deer browse, human disturbance i.e. recreational uses, high noise levels from Highway 416, along the western boundary. The development and build out of the Citigate development with its large box store retailers and the huge warehouse to the north, as well as the construction of Citigate Drive and Systemhouse Street has impacts on the adjacent habitats. The presence of two invasive species were documented throughout the site and included Manitoba maple (*Acer negundo*) and glossy buckthorn (*Rhamnus frangula*). Common urban breeding birds and mammals were documented throughout, with only one regionally uncommon species Virginia stickseed (*Hackelia virginiana*) in the deciduous forest type.

3.3.1 O'Keefe Drain Woodlot Study

A woodlot study was completed within the O'Keefe Drain area in 2012 which encompassed the subject lands. The focus of the study was to determine the extent and significance of the woodland feature on site and provide advice on the presence of Species at Risk. As the areas of the subject property had not changes since that time, we have included a summary of the ELC codes based on that previous study. The following is a summary of the field investigation findings:

3.3.2 Vegetation Findings:

3.3.2.1 Reed-canary Grass Mineral Meadow Marsh (ELC code: MAM2-2)

This mineral meadow marsh was a low-lying area on the western edge of the woodlot that collected seasonal runoff forming a spring pond that dries up eventually in the summer months. The ponded area was dominated with reed-canary grass (*Phalaris arundinacea*) with common cattail (*Typha latifolia*), wool-grass (*Scirpus cyperinus*), field horsetail (*Equisetum arvense*) and sensitive fern (*Onoclea sensibilis*) as minor associates.

3.3.2.2 White Cedar-Hardwood Organic Mixed Swamp (ELC Code: SWM4-1)

This small patch (<0.5 ha) of swamp is intermixed among a moist cedar forest. This was considered an inclusion but has been delineated into its own unit to show its presence. This area is seasonally wet and contains a mixture of eastern white cedar and hardwood species, distinguishing it from its surroundings of cedar dominant forest. Red maple (*Acer rubrum*), white birch (*Betual papyrifera*), black ash (*Fraxinus nigra*) and yellow birch (*Betula alleghaniensis*) are found as associates. The herbaceous layer was sparse with a high diversity of ferns, including marginal wood-fern (*Dryopteris marginalis*), Christmas fern (*Polystichum acrostichoides*), spinulose wood-fern (*Dryopteris carthusiana*), ostrich fern (*Matteuccia struthiopteris*) and cinnamon fern (*Osmunda cinnamonmea*), drawf scouring-rush (*Equisetum scirpoides*), wood nettle (*Laportea canadensis*), dwarf raspberry (*Rubus pubescens*) and Jack-in-the-pulpit (*Arisaa triphyllum*) were also found in the herbaceous layer.

3.3.2.3 Dry - Fresh Sugar Maple Deciduous Forest (ELC code: FOD5-1)

This is a dense, mature sugar maple (*Acer saccharum ssp. saccharum*) forest stand with an understory of regenerating maple saplings. This community had a high diversity of tree species. American basswood, American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), American elm, white ash (*Fraxinus americana*) and eastern white cedar were found as minor associates. A few large American beech trees were found within this community, signifying its maturity. European buckthorn, prickly gooseberry (*Ribes cynosbati*), red-berried elderberry (*Sambucus racemosa*) and hawthorn (*Crataegus sp.*) were scattered in the shrub layer amongst the regenerating saplings. The herbaceous layer was dense in areas, with a few low lying areas dominated with spotted jewelweed (*Impatiens capensis*). Dominate species in the ground layer include Pennsylvania sedge (*Carex pensylvanica*), Canada enchanter's nightshade (*Circaea lutetiana ssp. canadensis*), Canada mayflower (*Maianthemum canadense*), bitter nightshade (*Solanum dulcamara*), garlic mustard (*Alliaria petiolata*) and Virginia creeper (*Parthenocissus inserta*).

3.3.2.4 Fresh-Moist White Cedar Coniferous Forest (ELC code: FOC4-1)

This is a moist dense forest dominated with eastern white cedar. The topography was very hummocky allowing vernal pools to form in the spring. Herbaceous cover was very sparse due to the dense canopy cover and a high degree of blow down was present throughout the community. Sugar maple, white ash, ironwood (*Ostrya virginiana*) and eastern hemlock (*Tsuga canadensis*) are found as minor associates in areas where canopy cover is more open. Wild red raspberry (*Rubus idaeus*), maple-leaf vibernum (*Vibernum acerifolium*) and red-berried elderberry were found in the sparse understory. Helleborine (*Epipactis helleborine*), Canada enchanter's nightshade, American stinging nettle (*Urtica dioica ssp. gracilis*), wild sarsasparilla (*Aralia nudicaulis*) and purple trillium (*Trillium erectum*) were found in the ground layer.

3.3.2.5 Fresh Moist White Cedar-Sugar Maple Mixed Forest (ELC code: FOM7-2)

This ELC type is found in two patches in the woodlot where it is likely that wood clearing occurred in the eastern white cedar forest that allowed sugar maple to regenerate. Species diversity is different than the surrounding habitat because light was able to penetrate the forest floor, allowing for a higher diversity in herbaceous cover. Northern beech fern (*Phegopteris connectilis*), trout lily (*Erythronium americanum*), red baneberry (*Actaea rubra*), wild leek (*Allium tricoccum*), marginal wood-fern, sensitive fern and violets (*Viola sp.*) are among a few of the species recorded.

3.3.2.6 Fresh-Moist Sugar Maple-Lowland Ash Deciduous Forest (ELC code: FOD6-1)

This area was a small patch of deciduous forest found among the white cedar forest. Like the FOM7-1, this young forest is likely regeneration after site clearing or logging. Sugar maple and white ash dominate the canopy layer. Trout lily, blue cohosh (*Caulophyllum giganteum*), bulbet bladder fern (*Cystopteris bulbifera*), oak fern (*Gymnocarpium dryopteris*), Canada mayflower, wooly blue violet (*Viola sororia*), marginal wood-fern and herb Robert (*Geranium robertianum*) were found in the herbaceous layer.

3.3.2.7 Dry-Fresh White Cedar Coniferous Forest (ELC code: FOC2-2)

This dry cedar forest was found in areas of high disturbance and is found bordering the trail entering the woodlot and in the northern portion of the woodlot. Eastern white cedar was the dominant tree species with a dense canopy cover and sparse understory. American basswood, American elm, Manitoba maple (*Acer negundo*) and sugar maple were found as minor associates. European buckthorn and hawthorn species were common shrubs. Wild red raspberry was a dominant species in the herb layer.

3.3.2.8 Old Field Meadow (ELC code: CUM1-1)

This field area lined the trail heading into the woodlot on the eastern side. A high diversity of typical field/meadow species was found. Tree saplings were found in the shrub layer and included eastern white cedar, Manitoba maple, sugar maple, red pine (*Pinus rubra*) and apple (*Malus domestica*). Pussy willow, common juniper, hawthorn species and European buckthorn are common shrubs. Canada goldenrod was the dominant species in the herbaceous layer along with awnless brome grass, timothy (*Phleum pratense*), white bedstraw (*Galium mollugo*), Virginia creeper and wild grape.

3.3.2.9 Birds

A total of forty-nine (49) bird species were recorded within the historic study area (**Appendix II of Attachment A)**. Our 2022 surveys of the subject property identified 31 species. Five (5) area sensitive bird species were observed in the area. Area sensitive species are those that require a minimum hectarage of contiguous suitable habitat to successfully breed (MNR, 2000). These included: magnolia warbler (*Dendroica magnolia*), black-throated-green warbler (*Dendroica virens*), American redstart (*Setophaga ruticilla*), ovenbird (*Seiurus aurocapillus*) and savannah sparrow (*Passerculus sandwichensis*). Three (3) species at risk were recorded, the chimney swift (*Chaetura pelagica*), barn swallow (*Hirundo rustica*) and bobolink (*Dolichonyx oryzivorus*).

3.3.2.10 Mammals and Herpetozoa

Evidence of mammals observed during the surveys included white-tailed deer (*Odocoileus virginianus*), common raccoon (*Procyon lotor*), coyote (*Canis latrans*), eastern cottontail (*Sylvilagus floridanus*) and eastern chipmunk (*Tamias striatus*).

No amphibians were recorded during field visits. One reptile species was observed, eastern gartersnake (*Thamnophis sirtalis*).

3.3.3 Birds

3.3.3.1 Level of Effort

Surveys for breeding birds were conducted in the study area by GHD biologists according to the methodologies outlined in Section 2.2.2.2. A summary of the level of effort and environmental conditions at the time of survey have been provided in Table 2.

Table 3 Bird Surveys – Level of Effort

Survey Date	Survey Type	Weather	Start Time	Effort (Person hrs.)
June 6, 2022	Breeding Bird Surveys	13°C, Cloud cover 90%, Beaufort Wind Scale 0, no precipitation	6:45	1
June 15, 2022	Breeding Bird Surveys	19°C, Cloud cover increasing, Beaufort Wind Scale 1, no precipitation	5:55	1

3.3.3.2 Breeding Bird Surveys

Thirty-one (31) bird species were identified during breeding bird surveys conducted on June 6th and 15th, 2022 (Appendix B). Survey stations were established throughout the study area to capture all habitat types, including field edges, woodlands, and wetland. Overall, the property was mainly upland forest.

Identified field and hedgerow associated species included, mourning dove (*Zenaida macroura*), song sparrow (*Melospiza melodia)* and American goldfinch (*Carduelis tristis)*.

Birds identified in the wetlands included: common yellowthroat (*Geothypis trichas*), yellow warbler (*Dendroica petechia*) and red-winged blackbird (*Agelaius phoeniceus*).

Upland forest birds encountered during surveys included; Black-capped Chickadee (*Poecile atricapillus)*, Red-eyed Vireo (*Vireo olivaceus)*, and Great Crested Flycatcher *(Myiarchus crinitus).*

3.3.3.3 Herpetozoa

Only gray tree frog was heard calling in the woodland. American toad tadpoles were found in the ponded area of the western wetland community. Ponding elsewhere on the subject property was limited at the time of the surveys.

3.3.3.4 Other Wildlife

Wildlife species observed in 2021 and 2022 on site included red squirrel, eastern cottontail, white-tailed deer and coyote.

3.3.3.5 Wetlands

Two wetland communities were identified on the subject property. Neither of these communities have been identified as provincially significant wetland. Their characteristics are described in Section 3.2.1.2. There is no provincially significant wetland nearby that could result in complexing the on-site wetlands.

3.3.3.6 Woodlands

Most of the property was identified as woodland. The woodland included several different coniferous and deciduous woodland types.

3.3.3.7 Significant Wildlife Habitat

During our review of candidate significant wildlife habitat, the following were identified as potentially present on site: bat maternity roosting habitat, amphibian breeding habitat (woodland), amphibian breeding habitat (wetland), Woodland area-sensitive bird breeding habitat, and habitat for Special Concern and Rare Wildlife species.

4. Discussion and Analysis

4.1 Species and Communities

4.1.1 Vegetation

GHD biologists found no species that are classified as federally and/or provincially rare in the study area (SARA 2021; COSEWIC 2021; COSSARO 2021). Additionally, three regionally rare plant species (Riley, 1989).

None of the ecological communities (i.e., ELC ecosites or vegetation communities) found in the study are considered provincially rare (NHIC, 2021).

4.1.2 Birds

The Ontario Breeding Bird Atlas (OBBA – 2nd atlas) records for the 10 km by 10km square that overlaps the property (17QJ39) included eleven (11) bird species that are listed nationally or provincially as species at risk (COSSARO 2021; SARA 2021; COSEWIC 2020). These records were of least bittern (*Ixobrychus exilis*), common nighthawk (*Chordeiles minor*), Eastern whip-poor-will (*Caprimulgus vociferus*), red-headed woodpecker *(Melanerpes erythrocephalus*), Eastern wood-pewee (*Contopus virens*), bank swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), wood thrush (*Hylocichla mustelina*), grasshopper sparrow (*Ammodramus savannarum*), bobolink (*Dolichonyx oryzivorus*), and eastern meadowlark (*Sturnella magna*).

None of the species were found on this property during our previous or current field investigations. All are associated with open grassland, exposed bluff faces, or wetlands dominated by narrow leaved plant species, neither of which were present on the site. None were observed during our surveys. Habitat is not ideal for those species that prefer more open forest.

The Ontario Natural Heritage Information Centre (NHIC) does not include the subject property and the immediate area in its data base.

4.1.3 Other Wildlife

No other federal or provincial species at risk were recorded on the subject property during the site visit (SARA 2021; COSEWIC 2020; COSSARO, 2021). Our background review using the Ontario Natural History Information Centre did

not identify any significant wildlife species on the property. Habitat for foraging bats may exist on the property. GHD did not identify any candidate maternity roost trees on site.

4.2 Natural Features

4.2.1 Wetlands

According to the most recent information from OMNRF (Ontario Natural Heritage Information Centre, 2021) there are no provincially significant wetlands (PSW) within 120m of the subject property. Two areas of unevaluated wetlands were identified on the subject property.

4.2.2 Woodlands

The woodlands on site made up the majority of the property and are both deciduous woodlands containing young to mature trees. This woodland is approximately 3.5 hectares in size but is fairly isolated and lacks any real corridor functions. The woodland, nevertheless, provides habitat and cover to breeding birds and wildlife.

4.2.3 Significant Wildlife Habitat

Significant Wildlife Habitat often occurs within other natural heritage features and areas covered by Policy 2.1 of the Provincial Policy statement (e.g., significant wetlands). Therefore, it has been suggested that identification and evaluation of significant wildlife habitat is best undertaken after other natural heritage features have been identified (Natural Heritage Reference Manual, 2010).

GHD biologists analyzed the information collected from the ecological communities on the subject property using the criteria for Significant Wildlife Habitat in Ecoregion 6E (2015) and identified five (5) candidate SWH on the property: Bat Maternity Colonies, Amphibian Breeding Habitat (Wetland), Woodland Area-Sensitive Bird Breeding Habitat, Special Concern and Rare Wildlife Species

Of these candidates SWH features, none were confirmed on site.

The four candidate SWH types that were found to be possible with a low to moderate degree of probability of occurring on site were based on ELC codes and on-site surveys. Bat Maternity Colonies were thought to be possible due to the presence of several mature trees scattered throughout communities 2 and 3. Amphibian Breeding Habitat (Wetland) due to presence of wetlands in communities 1 and 4. Woodland Area-Sensitive Bird Breeding Habitat as possible due to the ELC codes; FOD and SWD of communities found.

Table 4 Significant Wildlife Habitat – Candidate and Confirmed

Wildlife Habitat	Wildlife Species	Candidate SWH and Confirmed Habitat Criteria		Confirmed SWH and Defining Criteria	Candidate Habitat found within the Study Area	Confirmed Habitat found within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources			
Bat Maternity Colonies ***Rationale***: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes	– Big Brown Bat – Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: – FOD – FOM – SWD – SWM	– Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). – Maternity roosts are not found in caves and mines in Ontario. – Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25 cm dbh) wildlife trees – Female Bats prefer wildlife tree (snags) in early stages of decay, class 1–or class 1 or – Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred **Information Sources** – OMNRF for possible locations and contact for local experts University Biology Departments with bat experts.	– Maternity Colonies with confirmed use by: – >10 Big Brown Bats – >5 Adult Female Silver-haired Bats – The area of the habitat includes the entire woodland, or a forest stand ELC Ecosite or an Eco element containing the maternity colonies	Possible. Some large diameter trees were identified in mature woodland edge; however the density of snags and appropriate trees were low. The probability of this SWH to occur on this site is low.	Not Confirmed
Amphibian Breeding Habitat (Wetland) ***Rationale:*** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	– Eastern Newt – American Toad – Spotted Salamander – Four-toed Salamander – Blue-spotted Salamander – Gray Treefrog – Western Chorus Frog – Northern Leopard Frog – Pickerel Frog – Green Frog – Mink Frog – Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120 m) from woodland ecosites; however, larger wetlands containing predominantly aquatic species (e.g. Bullfrog) may be adjacent to woodlands	– Wetlands >500 m2 (about 25 m diameter), ccvii supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. – Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. – Bullfrogs require permanent water bodies with abundant emergent vegetation. **Information Sources** – Ontario Herpetofaunal Summary Atlas (or other similar atlases) – Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. – OMNRF Districts and wetland evaluations. Reports and other information available from Conservation Authorities.	Studies confirm: – Presence of breeding population of one or more of the listed newt/salamander species or two or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or two or more of the listed frog/toad species with Call Level Codes of 3. or Wetland with confirmed breeding Bullfrogs are significant. – The ELC ecosite wetland area and the shoreline are the SWH. – A combination of observational study and call count surveys will be required during the spring (March–June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. – If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.	Possible – Amphibian habitat exists in wetland and adjacent water course. Targeted amphibian surveys did not detect spring breeding frogs in the ponded area.	Not confirmed.

Wildlife Habitat	Wildlife Species	Candidate SWH and Confirmed Habitat Criteria		Confirmed SWH and Defining Criteria	Candidate Habitat found within the Study Area	Confirmed Habitat found within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources			
Woodland Area-Sensitive Bird Breeding Habitat ***Rationale:*** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest songbirds.	– Yellow-bellied Sapsucker – Red-breasted Nuthatch – Veery – Blue-headed Vireo – Northern Parula – Black-throated Green Warbler – Blackburnian Warbler – Black-throated Blue Warbler – Ovenbird – Scarlet Tanager – Winter Wren – Pileated Woodpecker **Special Concern:** – Cerulean Warbler – Canada Warbler	All Ecosites associated with these ELC Community Series: – FOC – FOM – FOD – SWC – SWM – SWD	– Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30 ha. – Interior forest habitat is at least 200 m from forest edge habitat. **Information Sources** Local birder clubs. – Canadian Wildlife Service (CWS) for the location of forest bird monitoring. – Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species Reports and other information available from Conservation Authorities.	Studies confirm: – Presence of nesting or breeding pairs of three or more of the listed wildlife species. – Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. – Conduct field investigations in spring and early summer when birds are singing and defending their territories.	No breeding area sensitive species identified.	Not confirmed
Special Concern and Rare Wildlife Species ***Rationale:*** These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1–S3, SH) plant and animal species. Lists of these species are tracked by the NHIC.	All plant and animal element occurrences (EO) within a 1- or 10-km grid. Older element occurrences were recorded prior to GPS being available; therefore, location information may lack accuracy	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites **Information Sources** NHIC will have Special Concern and Provincially Rare (S1–S3, SH) species lists with element occurrences data. – NHIC Website “Get Information”: http://nhic.mnr.gov.on.ca – Ontario Breeding Bird Atlas Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: – Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat.	No SC species identified.	No

5. Impact Assessment and Recommendations

The following section provides a description of the predicted impacts that may result from the proposed development (Table 7). It also identifies mitigation measures to be implemented to avoid and/or minimize adverse effects to the natural environment features within or near the project. A full list of mitigation measures has been provided in Section 7 of this report.

5.1 Natural Features

Significant Woodland

Official Plan Policies for Significant Woodland have identified that woodlands within urban settings must be 60 years or older. The FOM7-2 and FOD5-1 areas are older than 60 years old with over 30 large diameter sugar maple trees in the core part of the woodland. The OP has also established 0.8 ha as the minimum size threshold for urban Significant Woodlands. As the woodlands that are greater than 60 years old total 1.14 ha and 1.76 hectares, these portions of the Study Area meet the definitions of Significant Woodland as per Ottawa OP policy.

The City of Ottawa Significant Woodland guidelines state: In application, *only those areas/parts of an urban woodland that are greater than 60 years old, as demonstrated through aerial photography or other means, will be identified as significant and counted toward the 0.8 ha size threshold (Figure 2)*.

It would appear that the NHF shown in the Official Plan is strictly from air photo interpretation of the old trees visible in a fall air photo.

When applying the MNRF's Natural Heritage Reference Manual (2005) and the criteria for Significant Woodlands to the Study Area, it is found that the area does not likely meet Provincial definitions of Significant Woodland as per the Natural Heritage Reference Manual. Clearing has occurred in the woodland since the O'Keefe Drain Woodlot Study and has further reduced the woodland size from 13.4 ha to 7.96 ha.

Table 5 Summary of Woodland Functions

Function	Criteria	Policy	Function Present
1. Size	Size value is related to scarcity of woodland in the landscape derived on a municipal basis.	Natural Heritage Reference Manual	As per the Natural Heritage Reference Manual, the smallest possible woodlot size threshold is 2 hectares. The woodlot in its entirety is approximately 7.96 ha. Total urban woodlot area is unknown and therefore cannot be assessed.
2. Ecological Functions	– Connectivity – Woodland Interior – Ecological linkages – Water protection	Natural Heritage Reference Manual	– Connectivity – not present, isolated. – Woodland interior – 3500 sq m of interior habitat – Linkages not present due to isolation – Water protection – protection may be occurring in wetlands, however the site is not hydrologically linked to any other features.
3. Uncommon Characteristics	– Regionally significant species or species of special concern – older woodlands	Significant Wildlife Habitat Manual and Natural Heritage Reference Manual	– 4 regionally rare plant species identified in 2012 – Portions of forest with trees older than 60-100 years. – No provincially significant vegetation communities.
4. Economic and Social Values	– Producing economically valuable products – Special services like air-quality improvement or sustainable recreation. – Educational, cultural or historical value	Natural Heritage Reference Manual	– unknown
5. City functions	– access to public – carbon sequestering – public enjoyment		– private land with no recently used trails present, also posted no trespassing with chain link fence around the Amazon facility. – trees and other vegetated would function for carbon sequestering. – area is private land and not open to the public and is posted with no trespassing signs.
6. City criteria	-		

Section 5.2.2 of the Significant Woodland guidelines states: When it approved the new woodland policies in 2016, Council exempted those urban areas where it had already identified the natural heritage system through Secondary Plans, Community Design Plans, approved Plans of Subdivision, or Existing Conditions reports submitted and accepted by the City in support of on-going development applications. In such areas, new significant woodlands will not be identified.

Although not stated in the development EIS report for the development that occurred to the north, this policy is in part, what was used to allow removal of the entire woodland on the property to the north.

Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment.

City of Ottawa Natural Heritage Feature designation.

The new City of Ottawa Official Plan (November 2021) includes a number of terms, including Natural Heritage System, Urban Natural Features, Natural Heritage Features, Natural Heritage System Core Area, Natural Heritage System Linkage Areas shown on the Schedule C.11 series.

Each of these has a specific definition and, in some cases, overlap each other. The only feature that is shown for this property is the Natural Heritage Feature overlay. The property is not a linkage area, core area or Urban Natural Feature.

Section 5.6.4 of the new OP states:

> *2) The Natural Heritage Features overlay consists of those natural heritage features identified in section 4.8.1, Policy 3) which can reasonably be mapped and displayed at the resolution of the OP schedules.*

In this case the NHF feature is very small, but the green sickle shape can be seen on this property. The boundary of that feature is shown on our Figure 1 (yellow cross hatch). It seems to have included the more mature maple forest areas (greater than 60 yrs. old and greater than 0.8 ha total area), although that area is less distinct based on our field surveys. It does not include the entire UNA 50 area, or the other vegetation communities such as the cedar forests or regenerating fields, for the most part. It also includes one of the wetlands but not both.

Of the natural heritage features listed in section 4.8.1.3 the only features confirmed in that NHF area on this property would be b) habitat for threatened or endangered species (butternut), c) significant woodlands and possibly e) significant wildlife habitat.

> *Section 5.6.4.1.4 states…Development and Site Alteration proposed in or adjacent to natural heritage features shall be supported by an environmental impact study prepared in accordance with City guidelines.*
>
> *Section 5.6.4.1.5 states…Development and site alteration shall have no negative impact on the NHS or NHF. Development and site alteration shall be consistent with the conclusions and recommendations of the approved environmental impact study.*

As such an EIS would be required for any planning or site plan applications made. Options of how to achieve this "test" of the official plan re no negative impacts are found later in this report.

Wetlands

Two small wetlands have been identified on the property from previous reports. Typically, a 30 meter buffer is afforded to wetlands as per provincial policy. This is a separate issue from the woodland. Wetland here are not provincially significant features but local wetlands. As such they would be regulated by the Rideau Valley Conservation Authority.

Significant Wildlife Habitat

Significant wildlife habitat often occurs within other natural heritage features and areas covered by Policy 2.1 of the Provincial Policy statement (e.g., significant wetlands). Therefore, it has been suggested that identification and evaluation of significant wildlife habitat is best undertaken after other natural heritage features have been identified (Natural Heritage Reference Manual, 2010).

GHD biologists analyzed the information collected from the ecological communities on the subject property using the criteria for Significant Wildlife Habitat in Ecoregion 5E (2015) and identified four (4) candidate SWH on the property: Bat Cavity Trees and Special Concern and Rare Wildlife Areas. None were confirmed.

The impacts from adjacent developments in recent years have reduced the woodland in the former secondary plan area and this southern property, to the remnant patches on the subject property. The former area had a diversity of successional woodland, thicket and meadow communities that were connected to the former larger woodland in the area, the SWH features at that time were evident. The remnant parcel is a result of the adjacent recent industrial and

commercial development that has removed much of the forest cover. The remnant woodland parcel although still containing several different forest cover types, had limited functions in terms of SWH.

Species at Risk

At the time of the previous study conducted in 2012 by NEA, three SAR bird species (barn swallow, chimney swift and bobolink) were observed. Since 2012, almost all of these fields have been converted to industrial and commercial uses and the agricultural fields planted in crops. None of those previous species were observed in 2022 as a result.

5.1.1 Significant Woodland policy discussion

Due to the presence of Significant Woodlands and the Natural Heritage Feature designation, mitigation in the form of buffers may be required from the woodland boundaries. Because of these woodlands, a mitigation hierarchy must be followed as per the City of Ottawa Significant Woodland Policy document (2021).

The mitigation hierarchy is a widely accepted approach in conservation and land use planning for guiding decisions on protection of the natural environment. It categorizes and prioritizes protective measures according to their general type and effectiveness:

- Priority 1 - Avoidance: redirection of the proposed action away from the natural feature.
- Priority 2 - Minimization: reduction of the magnitude of the proposed action, either in space, time, or both.
- Priority 3 - Mitigation: protection of the feature from the proposed action, through measures such as changes in design, physical barriers, and modified operating procedures.
- Priority 4 - Compensation: off-setting of the impacts through replacement of the feature and its ecological functions elsewhere, typically at a ratio greater than 1:1 to reflect the greater risks.

Buffers may also be required from the wetlands on site, in particular the MAM2-1 wetland which abuts the Significant Woodlands. Typically, a buffer of 30 meters is afforded to wetlands as per Provincial Policy.

Obligation to acquire

6.1.3. Obligation to Acquire

Policy 5.2.1(5) of Ottawa's Official Plan requires the City to acquire properties in Natural Environment Areas or Urban Natural Features, at the request of the landowner, where the property is not otherwise constrained from development. In 2012, an Ontario Municipal Board ruling extended this requirement to lands constrained by other natural heritage features, where protection of the feature would prevent all legal development permitted under the zoning (OPA #76, OMB File #PL100206, April 26, 2012). With respect to significant woodlands, this policy implies that protection of some features may only be possible if the City acquires the affected land.

However, the obligation to acquire does not apply to significant woodlands in Urban Expansion Study Areas (Policy 3.11) or Developing Community (Expansion Areas) (Policy 3.12).

6.4.1. Urban Criteria for Impact Evaluation

Significant woodlands identified in the urban area and urban expansion areas may be subject to impacts from development, either within the woodland or adjacent to it. An Environmental Impact Statement is required to evaluate those impacts, in accordance with the policies of the PPS and the Official Plan.

The criteria for urban significant woodlands fall into two types: screening criteria, and comparative criteria.

Screening criteria represent important ecosystem functions and services that cannot be replaced or substituted, or for which impacts cannot be adequately mitigated. Areas of significant woodland providing these services should be conserved and protected from negative impact.

Comparative criteria represent those ecosystem services that can be replaced, substituted, or adequately mitigated through urban design or engineering. Inherent in the identification of comparative criteria is the principle that negative impacts may be permitted on the size, shape, or nature of a significant urban woodland, if the ecosystem services

provided by the woodland can be maintained or improved. It also acknowledges that negative impacts on the functions and services of a significant urban woodland may be necessary in order to achieve other policies and objectives of the Official Plan and the Provincial Policy Statement. Under such circumstances, the comparative criteria will be used to evaluate the nature and magnitude of those impacts and to evaluate development options.

6.4.3.1. Modification or Removal of Significant Urban Woodlands

Modification or removal of a significant urban woodland should be considered only where it can be demonstrated that the woodland has limited public value in its natural state or poses a potential risk to public health and safety that cannot be mitigated. In some cases, the location or nature of a significant urban woodland might create difficulties or obstacles for good urban design. Conversely, significant urban woodlands may create opportunities for improved urban design or increased land use efficiency.

6.4.4.3. Compensation for Ecosystem Services

Woodlot and tree retention always has priority. However, where cost or past planning decisions make full or even partial retention of an urban woodlot impractical, it will be necessary to mitigate or compensate for the lost benefits through enhanced, on-site, green design and technology

Within the context of the significant woodlands policies, compensation will focus on the replacement of ecosystem services within the development site and surrounding community. Monetary or compensation outside the study area will not be sought nor considered by the City. Notwithstanding this policy, however, compensation for tree removal or loss may still be required under other City policies and by-laws

In this we have concluded that modification of the woodland through several alternatives may be possible. This analysis was based on the current conditions and the current extent of the remaining woodland area (7.36 ha) total from the original 13.76 ha that existed in 2014 prior to implementation of the secondary plan and recent development of adjacent properties.

5.1.2 Potential Options for compensation/mitigation assessed based on the policies

Option 1: Retain full NHF feature with buffers

- retain 1.1 ha mature woodland (community FOM7-2) as per our mapping of the mature forest (significant woodland under City policies)
- buffer of 30 m on all sides.
- loss of 2.4 ha (our woodland and buffer area) but leaves odd shape to developable area.
- feature would be isolated woodland pocket with Highway 416 to west, Amazon to north, other developments to south and west. No fencerows or other natural areas for connectivity.

Option 2: retain some older trees, retain wetland MAM2-1 and buffer, with extensive 2:1 tree replacement.

- retain MAM2-1 community with buffer
- within that buffer on east side keep mature trees and existing tree cover where possible
- substantial plantings of new trees in buffer area that is currently open field (ratio 1:1.25 area wise)
- figure 2. attached shows option 2.

Option 3: remove all woodland with no retained NHF, significant woodland or wetland.

- from my analysis and the policies, removal of area with no compensation is not achievable.
- no pre 2006 draft plan of subdivision or approved CDP or secondary plan for this property.

– property is outside boundaries of Citigate plan of industrial subdivision approved earlier.
– significant woodland policies partially shown above, look at hierarchy and maintaining ecological functions.

Based on an ecological assessment of the current functions, changes that have occurred to the total woodland area, development impacts from adjacent properties and a review of the ecology, we have recommended option 2.

It is my opinion that this remnant woodland on this site falls under the Comparative criteria as per Policy 6.4.1.

The woodland is on private property and is not accessible to the public. There are no established trails in the area that includes this woodland. Multi-use trails are present on the west and south side of Citigate Drive as part of the cycling trail system for commuters and recreational use. These do not enter the woodland. There was some evidence of old farm lanes and random trails on this property but they were overgrown and not used recently. There was no evidence of use of the property by naturalists or others and it is relatively difficult to trek through. No parks of greenspace lands abut this property.

The ecological functions of this remnant woodland have been impacted by development of the area. This has created an isolated woodland. The functions currently identified are limited and similar to other urban treed areas where development has occurred.

The option recommended (Option 2) has been specifically designed to maintain some of the existing natural features and a representation of the ELC communities present in a block, that will be retained for the long term. This is shown on Figure 2. The 2.9 hectare block will be located outside of the developable area and the road pattern. This will create a rectangular block of natural area.

This will in part retain some of the identified Natural Heritage Feature area that meets the minimum requirements of 0.8 ha in size and having trees over 60 years old (see Figure 2).

The recommended block will maintain the wetland community MAM2-1 and the catchment area, as well as the ponded area in this community. The upland area that is currently abandoned pastureland and containing several invasive species, can, with some soil amendments and extensive plantings of native tree and shrub species, become a mixed woodland in the long term.

Retaining some of the mature trees (cedar, basswood, willow, sugar maple, ironwood) and a mix of coniferous and deciduous forest within that block will provide a seed source for new seedlings to establish and existing cover. The plantings will be conducted to diversify the forest community and tree species to include typical native species such as eastern white pine, red oak, sugar maple and trembling aspen and large-toothed aspen.

The sizes of the current ELC communities and the Natural Heritage Feature on presented in the following table, comparing pre-construction to post-construction areas.

Table 6 ELC Communities in Study Area (pre-construction and post-construction)

Current ELC community name	Current Area of community (m²)	Post-construction area (m²)
FOC4-1	52,632	9,503
CUM1-1	21,866	14,831
MAM2-1	4,332	4,332
SWM4-1	1,756	115
FOD6-1	1,647	941
FOM7-2	11,422	0 (to be compensated for)

Approx. NHF Overlay	Current Area of NHF (m²) on site	Post-construction area (m²)
NHF Overlay	38,871	9,359

This will provide a number of functions as listed below and explained in the following sections.

5.1.3 Current Woodland functions

The woodland on site is deciduous woodland totalling approximately 7.36 ha. Regarding significance, the City of Ottawa Official Plan states:

"…wooded areas larger than 0.5 hectares shall be considered as having the potential to be significant."

As per the Natural Heritage Reference Manual (2010), the woodland on site does meet the definitions of significant woodland (Table 5.1).

Table 7 Summary of Ecological Functions of Woodland currently based on GHD analyses

Function	Criteria	Policy	Function Present
Size	Size value is related to scarcity of woodland in the landscape derived on a municipal basis.	Natural Heritage Reference Manual	7.36 ha
Connectivity	Connected to other woodlands, valleys or natural heritage features	Natural Heritage Reference Manual	poor
Interior Habitat	Interior bird habitat greater than 100 m from edges	Natural Heritage Reference Manual	Yes (4000 sq. m.)
Part of valley	Associated with a watercourse	Natural Heritage Reference Manual	No
Regionally rare species or species of conservation concern	Regionally significant species or species of special concern	Significant Wildlife Habitat Manual and Natural Heritage Reference Manual	No
Old growth species	Several trees may be over 100 years old	Natural Heritage Reference Manual	Yes, in interior maples and some interior cedar trees

The compensation proposed will retain these functions in the long term. The preservation of some woodland and the wetland was determined to be a critical component, in terms of meeting the no negative impact requirement.

5.1.4 Compensation/ Mitigation

Figure 2 shows the development envelope that has been recommended. The area to the west is the area recommended for compensation, preservation, enhancement and mitigation measures.

The Natural Heritage Feature overlay shows the northern part of the NHF polygon has been removed and developed to the north. This has left a 3.87 ha portion on the subject property.

The air photo base on Figure 2 shows the tree cover on site and that the NHF includes all of the FOM7-2 community which has a number of large diameter sugar maples over 60 years old (orange and red colour on air photo). There are a few outlying larger diameter trees in the NHF polygon as well in communities FOC4-1 (to be retained) and FOD5-1 (to be removed).

The compensation proposed includes retaining the woodland ELC communities as per Table 6, post-construction area column, i.e., post development based on our recommended building envelope.

The removal of community FOM7-2 (11,422 m^2) will be compensated for by planting the old field meadow community (CUM1-1) in the western portion of the site.

The small area of the CUM1-1 community in the building envelope (southwest corner) is approximately 2,300 m^2 and will be removed as part of the building envelope. The remainder of this open community has scattered trees and shrubs but mostly open meadow species. The depth of topsoil is limited in the western parts as a ridge of limestone is close to the surface.

The planting plan for this area will be drafted by a landscape architect at detailed design stage.

Our recommendation for this area is that the following occur:

1. The NHF overlay as mapped in the Official Plan is being reduced from 3.87 ha to 0.94 ha based on the current extent of the polygon on this site (Figure 2 yellow hatched area). However with the compensation proposed the area of natural vegetation that will be created through plantings and then retained in the compensation area on this site will be 2.97 ha, in the future.
2. The wetland edge will be planted with a few silver maple, black willow and red maple to create a treed swamp community that will act as a vernal pool.
3. Planting of shallow rooted tree species in edge of the woodland and new woodland edge. Soil amendments added (30 cm topsoil) where soil depths are thinnest.
4. Tree species recommended in the compensation area are native species found commonly in the Ottawa area, that are adapted to shallow soils, open areas and are sun tolerant. They are almost all found already growing on the subject property in the portions of forest that are to be removed.
5. A diversity of shrubs can be included in the meadow areas with hardy and drought tolerant species such as common juniper, snowberry, staghorn sumac, ninebark, red cedar and fragrant sumac in nodes.
6. Long term objective is to establish a diversity of habitats with a wetland pocket of mature trees, savannah with scattered trees, old field meadow, shrub thicket and mature forest edge. This variety of community types and species mixtures is similar to what is present on the site currently.

Plant list is attached as an appendix (Appendix F).

Data Disclaimer

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Legend

- Site Limit
- Building Envelope
- Vegetation Communities
- Approx. Natural Heritage Features Overlay

1 cm = 16 meters

0 10 20 30 40

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 18N

Paper Size ANSI B

Q:\GIS\PROJECTS\12574000s\12574213\Layouts\202202_RPT001\12574213_202202_RPT001_GIS002 - Recommended Building Envelope and Compensation Area.mxd
Print date: 21 Jun 2022 - 07:38

GHD

Shane Kozminuk
444 Citigate Drive, Ottawa, ON
City of Ottawa

Recommended Building Envelope & Compensation Area

Project No. 12574213
Revision No.
Date: Jun 21, 2022

Figure 2

Data source: © City of Ottawa, 2019., © Google, 2021.

5.2 On-site - Site Selection Rationale

5.2.1 Benefits of Location and Design

The benefits of the location chosen, shape and sizing of the compensation woodland and tree preservation area are:

- Located on west side of property and outside of lotting and roads.
- Located on subject property, not on current City or MTO lands;
- Provides woodland zone wider than trees preserved on the Amazon site.
- Benefits wildlife by enhancing diversity of community types;
- Maintains access to retained wetland and vernal pool for amphibians using aquatic corridor;
- No road crossings between vernal pools, wetland, woodland;
- No runoff from roads or other hard surfaces entering wetland and woodland and isolated from stormwater;
- Retains some existing mature trees, regenerating edge habitat, wetland, ponded area and plants the open pioneer meadow.
- Suitable area to plant with dense plantings for long term woodland if supplemented with 30 cm topsoil
- Screens buildings from Highway 416
- If recreational trail designed in future, trail can route through area
- New woodland plantings are outside of any future development and to be preserved as a woodland for the long term.
- Opportunity to increase tree diversity and native component
- Opportunity to remove invasives (buckthorn, dsv, garlic mustard, wild parsnip) in open field

5.3 Compensation Plan

5.3.1 Preferred Compensation Technique

A dense planting plan is proposed for the open field areas of the compensation area.

5.3.1.1 Preparation

1. Develop an Erosion and Sediment Control Plan for the development including the restoration area.
2. Install heavy duty silt fence on downslope side of compensation area
3. Remove existing goldenrod, buckthorn shrubs and remove from site. Limit amount of topsoil loss within the vegetation roots.
4. Retain any trees in that area, including willows, cedar and regenerating edges.
5. Add 30 cm of topsoil to open field area portions of the compensation site.

5.3.1.2 Mitigation measures

1. No clearing of trees or shrubs within the peak breeding bird season (April 1- August 15th), preferably in the winter months
2. Development limit be clearing staked in the field and orange hoarding/snow fence be installed.
3. An edge management plan be prepared for the development
4. A tree protection and preservation plan be prepared by a qualified arborist.
5. A detailed sediment and erosion control plan be prepared.

6. A detailed landscape plan for the compensation area be prepared by a qualified landscape architect in consultation with a biologist.

5.3.2 Significant Wildlife Habitat

Four types of candidate significant wildlife habitat were identified as possible in the study area but could not be confirmed based on GHD's survey efforts (See Table 3).

Any vegetation clearing should occur outside of the breeding bird window (April 15th – August 15th). If possible, vegetation clearing should be limited as much as possible on site.

5.3.3 Species at Risk

The provincially and federally threatened wood thrush and Eastern wood pewee, a species of special concern were identified on the subject property. See section 5.1.3. for recommendations.

6. Policies and Legislative Compliance

The following section describes how the proposed development will be in conformance with the relevant federal, provincial and other regulatory legislation, policies, official plans and OP amendments that are applicable and relevant to the study area and the immediate vicinity.

6.1 Federal Legislation

6.1.1 Migratory Birds Convention Act

The core breeding period in Ontario for migratory birds under the MBCA for Bird Conservation Region 13 (i.e., the one the subject property lies within) extends from April 15th to August 15th (Environment and Climate Change Canada, 2014). As such clearing of the trees and other vegetation for the development cannot occur during this timing window.

6.2 Provincial Legislation

6.2.1 Endangered Species Act, 2007

No provincially threatened species were detected on the subject property therefore the project is in compliance with the act.

6.2.2 Provincial Policy Statement, 2020

In this EIS report, Section 5.1.1 contain recommendations that would permit the proposed development to proceed in a manner consistent the applicable sections of the Provincial Policy Statement (PPS).

6.3 Local and Other Regulatory Bodies

6.3.1 City of Ottawa Official Plan (2019)

In this EIS report, Section 4.8, 5.1 and 6.1 describe measures that would permit the proposed development application to proceed in a manner consistent the Official Plan (2016). Provided these measures are followed, there should be no negative impacts on Natural Features on the site.

The GHD recommendation based on the policies for significant woodlands is that removal of a large portion of the existing woodland be conducted. The recommended compensation is to preserve the western portion of the property, including the wetland and plant the open area in dense native trees to create a permanent natural area and forest cover. The rationale for the proposed compensation/ mitigation has been provided in this EIS.

6.3.2 Rideau Valley Conservation (Ontario Regulation 174/06)

Portions of the subject property are found in an area regulated by RVCA under Ontario Regulation 163/06. The proposed development will protect the unevaluated wetland community MAM2-1. There are no watercourses on this property or floodplain. Permitting will be required by RVCA under O.Reg 174/06 prior to development.

7. Summary of Recommendations

7.1 General

1. No development within the compensation area, including any general site preparation works, storage of materials, stockpiles or equipment. Area is to fenced off.
2. The limit of development shall be staked in the field. No development or site alteration activities are to occur outside this area (i.e., it is a “no touch” zone for construction).
3. The compensation area shall be enhanced with native species plantings/seeds.
4. A detailed sediment and erosion control plan will be completed for the site.
5. an edge management plan be prepared for the development
6. a tree protection and preservation plan be prepared by a qualified arborist.
7. a detailed sediment and erosion control plan be prepared.
8. a detailed landscape plan for the compensation area be prepared by a qualified landscape architect in consultation with a biologist/ restoration ecologist.
9. The overall existing drainage patterns for the lots will be maintained
10. Removal of vegetation within development envelopes shall be done outside of the peak breeding bird season (April 15th – August 15th) as per Environment and Climate Change Canada’s guidelines, preferably in winter.
11. Any areas outside of the buildings and built infrastructure shall be vegetated as soon as possible after construction to stabilize the soils and re-establish vegetation cover.
12. Where it is feasible, native trees, shrubs, grasses and/or wildflower seed mixes shall be used.
13. Client to obtain relevant permits from City of Ottawa and Rideau Valley Conservation.

7.2 Species at Risk

1. Ensure that on-site personnel are aware of Species at Risk that may be found in the study area and are able to recognize these species and their habitat(s).
2. Daily ongoing observation for SAR, and all wildlife more generally, will be undertaken during construction by all personnel on site.
3. Silt fencing installed must not have an open plastic mesh or netting that could lead to entanglement of wildlife.
4. Installation of sediment fencing on western development limit to double as exclusion fencing
5. An Erosion and Sediment Control (ESC) Plan will be developed and implement for the site that minimizes risk of sedimentation of the wetland and watercourse during all phases of the project.
6. The ESC will be reviewed by a professional biologist.

7. Track pads, concreate wash stations, refueling stations, and stockpile locations should be identified on the SEC plan and isolated using sediment control materials.
8. All sediment and erosion control products will be selected for the site based on the manufacturer's product specifications. Product installation and maintenance will follow the manufactures guidelines.
9. Sediment control measures shall be installed prior to the commencement of work and shall be maintained throughout the project to prevent the entry/outward flow of sediment into the watercourse.
10. All sediment and erosion control measures shall be inspected daily during the construction phase and periodically thereafter to ensure they are functioning properly, maintained, and upgraded as required. Sediment fence to be checked regularly to ensure they are maintained and working properly. Accumulated silt and debris will be removed from the fence and site after every precipitation event.
11. Disturbed soils will be immediately stabilized and re-vegetation with native species suitable for the site.
12. If sediment and erosion control measures are not functioning, the construction supervisor shall order the work to be stopped. No further work shall be carried out until the construction methods and/or the sediment control plan is adjusted to address the sediment/erosion problem(s). Such occurrences should be document by the site inspector and provided to a qualified biologist.
13. Construction should be undertaken during normal weather conditions, to the extent possible, and the project shall be designed to appropriate specifications to withstand variable weather conditions.
14. Erosion and sediment control measures will be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear.
15. Biodegradable sediment and erosion control products should be used over non-biodegradable products. Specifically, erosion control blankets.

8. Conclusion

GHD Limited has prepared this Environmental Impact Study report to address potential environmental issues associated with a proposed industrial development on 444 Citigate Drive in Ottawa.

The option recommended (Option 2) has been specifically designed to maintain some of the existing natural features and a representation of the ELC communities present in a block, that will be retained for the long term. This is shown on Figure 2. The 2.9 hectare block will be located outside of the developable area and the road pattern. This will create a rectangular block of natural area.

This will in part retain some of the identified Natural Heritage Feature area that meets the minimum requirements of 0.8 ha in size and having trees over 60 years old (see Figure 2).

The recommended block will maintain the wetland community MAM2-1 and the catchment area, as well as the ponded area in this community with planting of wetland trees along the edge. The upland area that is currently abandoned pastureland and containing several invasive species, can, with some soil amendments and plantings of native tree and nodes of shrubs, will become a mixed community with a diversity of habitats. Construction impacts can be minimized through detail design and implementation of the recommendations outlined in Sections 5 and 7 of this report. GHD's recommendations have been made to address potential impacts to natural features and/or their functions during the site preparation, construction and post-construction period. Additional discussions with the Rideau Valley Conservation, and the City of Ottawa need to occur to determine the project permitting requirements.

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Appendices

Appendix A

Plant Species by Community

APPENDIX A - Plant Species by Community

Families and genera for the plant species found in this appendix are listed in taxonomic order. The species are listed alphabetically by scientific name within each genus.

Three standard reference works were used for the botanical nomenclature and taxonomy (Newmaster et. al., 1998; Gleason and Cronquist 1991; Voss 1980; 1985). Other published works for botanical names included; ferns (Cody and Britton 1989); grasses (Dore and McNeill 1980); orchids (Whiting and Catling 1986); shrubs (Soper and Heimburger 1982) and trees (Farrar 1995).

Total: Number of communities where plant species was recorded
X : Plant species recorded

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER					
			1	2	3	4	5	6
HORSETAIL FAMILY	*EQUISETACEAE*							
field horsetail	*Equisetum arvense*	1	X					
BRACKEN FERN FAMILY	*DENNSTAEDTIACEAE*							
hay-scented fern	*Dennstaedtia punctilobula*	1	X					
BEECH FERN FAMILY	*THELYPTERIDAE*							
northern beech fern	*Phegopteris connectilis*	1	X					
WOOD FERN FAMILY	*DRYOPTERIDACEAE*							
bulbet bladder fern	*Cystopteris bulbifera*	2	X		X			
fragile fern	*Cystopteris fragilis*	2	X		X			
Mackay's brittle fern	*Cystopteris tenuis*	2		X	X			
spinulose wood-fern	*Dryopteris carthusiana*	3	X	X	X			
evergreen wood-fern	*Dryopteris intermedia*	1			X			
marginal wood-fern	*Dryopteris marginalis*	1	X					
oak fern	*Gymnocarpium dryopteris*	2	X		X			
ostrich fern	*Matteuccia struthiopteris*	3		X	X		X	
sensitive fern	*Onoclea sensibilis*	3	X	X	X			
Christmas fern	*Polystichum acrostichoides*	2		X	X			
PINE FAMILY	*PINACEAE*							
balsam fir	*Abies balsamea*	1	X					
tamarack	*Larix laricina*	1	X					
white spruce	*Picea glauca*	1	X					
eastern white pine	*Pinus strobus*	1	X					
CYPRESS FAMILY	*CUPRESSACEAE*							
common juniper	*Juniperus communis var. depressa*	1						X
eastern red cedar	*Juniperus virginiana*	1						X
eastern white cedar	*Thuja occidentalis*	2	X			X		

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER					
			1	2	3	4	5	6
BUTTERCUP FAMILY	*RANUNCULACEAE*							
white baneberry	*Actaea pachypoda*	1	X					
red baneberry	*Actaea rubra*	1	X					
virgin's bower	*Clematis virginiana*	1			X			
tall buttercup	*Ranunculus acris*	2		X		X		
ELM FAMILY	*ULMACEAE*							
common hackberry	*Celtis occidentalis*	2		X	X			
NETTLE FAMILY	*URTICACEAE*							
American stinging nettle	*Urtica dioica ssp. Gracilis*	1					X	
WALNUT FAMILY	*JUGLANDACEAE*							
bitternut hickory	*Carya cordiformis*	3	X	X	X			
BEECH FAMILY	*FAGACEAE*							
American beech	*Fagus grandifolia*	2		X	X			
bur oak	*Quercus macrocarpa*	2		X	X			
red oak	*Quercus rubra*	1	X					
BIRCH FAMILY	*BETULACEAE*							
yellow birch	*Betula alleghaniensis Britt.*	3	X	X	X			
ironwood	*Ostrya virginiana*	1	X					
PURSLANE FAMILY	*PORTULACACEAE*							
Carolina spring beauty	*Claytonia caroliniana*	2		X	X			
PINK FAMILY	*CARYOPHYLLACEAE*							
mouse-eared chickweed	*Cerastium fontanum*	1				X		
common chickweed	*Stellaria media*	1				X		
BUCKWHEAT FAMILY	*POLYGONACEAE*							
curled dock	*Rumex crispus*	1				X		
bitter dock	*Rumex obtusifolius*	1			X			
LINDEN FAMILY	*TILIACEAE*							
American basswood	*Tilia americana*	1	X					
VIOLET FAMILY	*VIOLACEAE*							
sweet white violet	*Viola blanda*	2		X	X			
early blue violet	*Viola palmata*	1			X			
downy yellow violet	*Viola pubescens*	4	X	X	X	X		
WILLOW FAMILY	*SALICACEAE*							
large-toothed aspen	*Populus grandidentata*	1	X					
trembling aspen	*Populus tremuloides*	2	X				X	
MUSTARD FAMILY	*BRASSICACEAE*							
garlic mustard	*Alliaria petiolata*	1	X					
field mustard	*Brassica rapa*	1				X		
toothwort	*Cardamine diphylla*	3	X	X	X			
Pennsylvania bittercress	*Cardamine pensylvanica*	1				X		
dame's rocket	*Hesperis matronalis*	1			X			
PRIMROSE FAMILY	*PRIMULACEAE*							
starflower	*Trientalis borealis*	1	X					

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER					
			1	2	3	4	5	6
GOOSEBERRY FAMILY	*GROSSULARIACEAE*							
bristly black currant	*Ribes lacustre*	3	X	X	X			
SAXIFRAGE FAMILY	*SAXIFRAGACEAE*							
foam flower	*Tiarella cordifolia*	3	X	X	X			
ROSE FAMILY	*ROSACEAE*							
hawthorn species	*Crataegus spp.*	3		X	X			X
common strawberry	*Fragaria virginiana*	2	X					X
yellow avens	*Geum aleppicum*	1			X			
apple	*Malus domestica*	1						X
common crabapple	*Malus pumila*	1					X	
black cherry	*Prunus serotina*	1		X				
wild red raspberry	*Rubus idaeus*	2	X					X
thimbleberry	*Rubus occidentalis*	1						X
PEA FAMILY	*FABACEAE*							
black medick	*Medicago lupulina*	1			X			
alfalfa	*Medicago sativa ssp. Sativa*	1				X		
white sweet-clover	*Melilotus alba*	1			X			
red clover	*Trifolium pratense*	1				X		
white clover	*Trifolium repens*	1				X		
cow vetch	*Vicia cracca*	1				X		
LOOSESTRIFE FAMILY	*LYTHRACEAE*							
purple loosestrife	*Lythrum salicaria*	2				X	X	
EVENING PRIMROSE FAMILY	*ONAGRACEAE*							
Canada enchanter's nightshade	*Circaea lutetiana L. ssp.canadensis*	3	X	X	X			
DOGWOOD FAMILY	*CORNACEAE*							
red-osier dogwood	*Cornus stolonifera*	2				X	X	
BUCKTHORN FAMILY	*RHAMNACEAE*							
alder-leaved buckthorn	*Rhamnus alnifolia*	2		X	X			
European buckthorn	*Rhamnus cathartica*	4		X	X	X		X
glossy buckthorn	*Rhamnus frangula*	1				X		
GRAPE FAMILY	*VITACEAE*							
Virginia creeper	*Parthenocissus inserta*	2	X		X			
wild grape	*Vitis riparia*	3	X		X	X		
MAPLE FAMILY	*ACERACEAE*							
Manitoba maple	*Acer negundo*	1				X		
Norway maple	*Acer platanoides*	1		X				
silver maple	*Acer saccharinum*	1	X					
sugar maple	*Acer saccharum ssp.saccharum*	2	X		X			
Freeman's maple	*Acer x freemanii*	1					X	
CASHEW FAMILY	*ANACARDIACEAE*							
western poison-ivy	*Rhus rydbergii*	1	X					
staghorn sumac	*Rhus typhina*	2			X			X

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER					
			1	2	3	4	5	6
WOOD-SORREL FAMILY	*OXALIDACEAE*							
European wood-sorrel	*Oxalis stricta*	2	X			X		
GERANIUM FAMILY	*GERANIACEAE*							
herb Robert	*Geranium robertianum*	2	X			X		
GINSENG FAMILY	*ARALIACEAE*							
wild sarsaparilla	*Aralia nudicaulis*	2		X	X			
spikenard	*Aralia racemosa*	1	X					
CARROT FAMILY	*APIACEAE*							
wild chervil	*Anthriscus sylvestris*	1			X			
Queen-Anne's lace	*Daucus carota*	2				X		X
wild parsnip	*Pastinaca sativa*	3	X			X		X
MILKWEED FAMILY	*ASCLEPIADACEAE*							
common milkweed	*Asclepias syriaca*	2			X			X
NIGHTSHADE FAMILY	*SOLANACEAE*							
bitter nightshade	*Solanum dulcamara*	2	X		X			
MINT FAMILY	*LAMIACEAE*							
henbit	*Lamium amplexicaule*	1				X		
motherwort	*Leonurus cardiaca*	1			X			
heal-all	*Prunella vulgaris ssp. Lanceolata*	1	X					
PLANTAIN FAMILY	*PLANTAGINACEAE*							
broad-leaved plantain	*Plantago major*	1			X			
Rugel's plantain	*Plantago rugelii*	1			X			
OLIVE FAMILY	*OLEACEAE*							
white ash	*Fraxinus americana*	3	X	X	X			
green ash	*Fraxinus pennsylvanica var. subinteg*	1				X		
FIGWORT FAMILY	*SCROPHULARIACEAE*							
common mullein	*Verbascum thapsus*	3		X	X			X
common speedwell	*Veronica officinalis*	1	X					
MADDER FAMILY	*RUBIACEAE*							
white bedstraw	*Galium mollugo*	3	X			X		X
marsh bedstraw	*Galium palustre*	2	X				X	
HONEYSUCKLE FAMILY	*CAPRIFOLIACEAE*							
red-berried elderberry	*Sambucus racemosa*	1	X					
Guelder rose	*Viburnum americanum*	2		X	X			
wayfaring tree	*Viburnum lantana*	2		X	X			

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER					
			1	2	3	4	5	6
ASTER FAMILY	*ASTERACEAE*							
common yarrow	*Achillea millefolium*	1				X		
common burdock	*Arctium minus*	1				X		
nodding thistle	*Carduus nutans*	1					X	
ox-eye daisy	*Chrysanthemum leucanthemum*	1			X			
bull thistle	*Cirsium vulgare*	1			X			
daisy fleabane	*Erigeron annuus*	1				X		
elecampane	*Inula helenium*	1				X		
Canada goldenrod	*Solidago canadensis*	1				X		
early goldenrod	*Solidago juncea*	2					X	X
common dandelion	*Taraxacum officinale*	3		X	X			X
ARUM FAMILY	*ARACEAE*							
Jack-in-the-pulpit	*Arisaema triphyllum*	3	X	X	X			
SEDGE FAMILY	*CYPERACEAE*							
Pennsylvania sedge	*Carex pensylvanica*	2	X	X				
GRASS FAMILY	*POACEAE*							
awnless brome grass	*Bromus inermis ssp.inermis*	1						X
white-grained mountain rice	*Oryzopsis asperifolia*	1			X			
reed canary grass	*Phalaris arundinacea*	2					X	X
Kentucky blue grass	*Poa pratensis*	1				X		
CATTAIL FAMILY	*TYPHACEAE*							
common cattail	*Typha latifolia*	1					X	
LILY FAMILY	*LILIACEAE*							
trout lily	*Erythronium americanum ssp. americ*	2		X	X			
Canada mayflower	*Maianthemum canadense*	3	X	X	X			
purple trillium	*Trillium erectum*	4	X	X	X	X		
white trillium	*Trillium grandiflorum*	1	X					
ORCHID FAMILY	*ORCHIDACEAE*							
helleborine	*Epipactis helleborine*	1	X					
Total Number of Plant Species	125		54	34	54	32	12	18
			Number of Plant Species Per Community					

Appendix B

List of Significant Plant Species

APPENDIX B List of Significant Plant Species

Plant species observed by NEA with significant status on national, provincial and relevant regional lists are listed with status codes and where applicable the most current year of publication. Three standard reference works were used for the botanical nomenclature and taxonomy (Newmaster et. al., 1998; Gleason and Cronquist 1991; Voss 1980; 1985). Other published works for botanical names included; ferns (Cody and Britton 1989); grasses (Dore and McNeill 1980); orchids (Whiting and Catling 1986); shrubs (Soper and Heimburger 1982) and trees (Farrar 1995).

NATIONAL RANKING **Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Government of Canada**
Species at Risk Act (SARA), SCHEDULE 1 (Subsections 2(1), 42(2) and 68(2)), Government of Cana

PROVINCIAL RANKING **Species at Risk in Ontario (COSSARO), Government of Ontario**
Provincial Rank (SRANK), Natural Heritage Information Center, Government of Onta

REGIONAL RANKING **Brunton Ottawa** Brunton, 2005, Ottawa

STATUS CODES

COSEWIC	**END ***	- Endangered Species
COSSARO	**THR ***	- Threatened Species
SARA	**SC ***	- Species of Concern
SRANK	**S1**	- Extremely Rare
	S2	- Very Rare
	S3	- Rare to Uncommon
Regional Lists	**R**	- Rare native species
	RS	-Regional significant
	EXP	- Extirpated native species

***Year of Status Publication included in Code**

Other national or provincial codes not listed

Other Regional codes not listed

			NATIONAL RANKINGS		PROVINCIAL RANKINGS		REGIONAL RANKINGS				
Common Name	**Scientific Name**		**COSEWIC**	**SARA**	**COSSARO**	**SRank**	**Brunton Ottawa**				
wild chervil	Anthriscus sylvestris						R				
wayfaring tree	Viburnum lantana						R				
nodding thistle	Carduus nutans						R				
Plants with Ranking	**Total:** 3	**Status List Totals**	0	0	0		3	0	0	0	0

Appendix C

Bird Status Report

APPENDIX C Bird Status Report - Comprehensive

Bird species observed by GHD are listed in the order followed the American Ornithologists' Union (AOU) Check-list of North American birds (7th edition, 1999, 47th Supplement). Common and scientific nomenclature are based on those used by AOU. Breeding status and breeding evidence code are listed when observed. Any significant status for a species on national and provincial lists is displayed as well as those from relevant regional lists.

List Status :	**END - endangered**	A wildlife species facing imminent extirpation or extinction.
	END-R -endangered regulated	A wildlife species facing imminent extirpation or extinction in Ontario which has been regulated under Ontario's Endangered Species Act (ESA).
	THR - threatened	A wildlife species likely to become endangered if limiting factors are not reversed.
	SC - special concern	A wildlife species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.
	YES - Area Sensitive	A wildlife species that requires large areas of suitable habitat in order to sustain their population numbers.

*** Other status levels are not displayed**

List Sources:	**COSEWIC**	The Committee on the Status of Endangered Wildlife in Canada, May 2018.
	COSSARO	The Committee on the Status of Species at Risk in Ontario, June 2018.
	SARA	Species At Risk Act, Schedule 1, Government of Canada, 2018.
	Area Sensitive	Significant Wildlife Technical Guide, Appendix C, OMNR, Oct. 2000
	Region 6	Southern Ontario Wetland Evaluation Appendix 11B, Version 3.2, March 2013

Breeding Status: (Observed By NEA)

B -species observed in breeding season in suitable habitat with some evidence of breeding (confirmed, probable or possible as per Ontario Breeding Bird Atlas, 2002).
F -species observed in breeding season but no evidence of breeding or suitable nest sites available on the study site (includes flyovers, migrants and foraging colonial breeders).
M -species observed outside of breeding season for that species and in area outside of the known breeding range for that species.

Breeding Evidence Code: (Observed By NEA)

OBSERVED
X -species observed in its breeding season (no evidence of breeding).

POSSIBLE BREEDING
H -species observed in its breeding season in suitable nesting habitat
S -singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat

PROBABLE BREEDING
P -pair observed in their breeding season in suitable nesting habitat
T -permanent territory presumed through registration of territorial song on at least 2days, a week or more apart, at the same place
D -courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V -visiting probable nest site
A -agitated behaviour or anxiety calls of an adult
B -brood patch on adult female or cloacal protuberance on adult male
N -nest-building or excavation of nest hole

CONFIRMED BREEDING
DD -distraction display or injury feigning
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
AE -adults leaving or entering nest site in circumstances indicating occupied nest
FS -adult carrying fecal sac
CF -adult carrying food for young
NE -nest containing eggs
NY -nest with young seen or heard SOURCE: Ontario Breeding Bird Atlas March 2001

AOU Code	Common Name	Scientific Name	Observed Breeding Status	Breed Evidence Code	COSEWIC	COSSARO	SARA	Area Sensitive	Region 6		
DCCO	Double-crested Cormorant	*Phalacrocorax auritus*	X	None				No			
KILL	Killdeer	*Charadrius vociferus*	B	H				No			
SPSA	Spotted Sandpiper	*Actitis macularia*	B	None				No			
RBGU	Ring-billed Gull	*Larus delawarensis*	X	None				No			
NOFL	Northern Flicker	*Colaptes auratus*	B	S				No			
GCFL	Great Crested Flycatcher	*Myiarchus crinitus*	B	S				No			
EAKI	Eastern Kingbird	*Tyrannus tyrannus*	B	H				No			
REVI	Red-eyed Vireo	*Vireo olivaceus*	B	S				No			
BLJA	Blue Jay	*Cyanocitta cristata*	B	FY				No			
AMCR	American Crow	*Corvus brachyrhynchos*	B	H				No			
BCCH	Black-capped Chickadee	*Poecile atricapillus*	B	S				No			
HOWR	House Wren	*Troglodytes aedon*	B	S				No			
AMRO	American Robin	*Turdus migratorius*	B	S				No			
EUST	European Starling	*Sturnus vulgaris*	B	AE				No			
CEWX	Cedar Waxwing	*Bombycilla cedrorum*	B	P				No			
NAWA	Nashville Warbler	*Vermivora ruficapilla*	B	S				No			
YEWA	Yellow Warbler	*Dendroica petechia*	B	S				No			
CSWA	Chestnut-sided Warbler	*Dendroica pensylvanica*	B	S				No			
BTBW	Black-throated Blue Warbl	*Dendroica caerulescens*	M	S				Yes			migrant
BTGW	Black-throated Green War	*Dendroica virens*	M	S				Yes			migrant
COYE	Common Yellowthroat	*Geothlypis trichas*	B	S				No			
CHSP	Chipping Sparrow	*Spizella passerina*	B	S				No			
SOSP	Song Sparrow	*Melospiza melodia*	B	S				No			
NOCA	Northern Cardinal	*Cardinalis cardinalis*	B	S				No			
RBGR	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	B	S				No			
RWBL	Red-winged Blackbird	*Agelaius phoeniceus*	B	S				No			

COGR	Common Grackle	*Quiscalus quiscula*	B	H				No				
PUFI	Purple Finch	*Carpodacus purpureus*	B	S				No				
HOFI	House Finch	*Carpodacus mexicanus*	B	S				No				
AMGO	American Goldfinch	*Carduelis tristis*	B	P				No				
HOSP	House Sparrow	*Passer domesticus*	B	H				No				
TOTAL SPECIES OBSERVED:	**31**	**BREEDING SPECIES OBSERVED:**	**31**		**0**	**0**	**0**	**2**	**0**	**0**	**0**	

Appendix D

Herpetozoa Status Report

APPENDIX D Herpetozoa Status Report

Project ID: 12574-213

Herpetozoa (amphibian and reptile) species observed by GHD are listed by class then by family taxonomic grouping. These species are identified by the common and scientific name used by the Natural heritage information Centre (NHIC). Any significant status for a species on national and provincial lists is displayed as well as those from relevant regional lists.

List Status :	**END - endangered**	A wildlife species facing imminent extirpation or extinction.
	END-R -endangered regulated	A wildlife species facing imminent extirpation or extinction in Ontario which has been regulated under Ontario's Endangered Species Act (ESA).
	THR - threatened	A wildlife species likely to become endangered if limiting factors are not reversed.
	SC - special concern	A wildlife species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.
	YES - Area Sensitive	A wildlife species that requires large areas of suitable habitat in order to sustain their population numbers.

*** Other status levels are not displayed**

List Sources:	**COSEWIC**	The Committee on the Status of Endangered Wildlife in Canada, May 2017.
	COSSARO	The Committee on the Status of Species at Risk in Ontario, June 2017.
	SARA	Species At Risk Act, Schedule 1, Government of Canada, 2017.
	Area Sensitive	Significant Wildlife Technical Guide, Appendix C, OMNR, Oct. 2000

Amphibian

Common Name	Scientific Name	COSEWIC	COSSARO	SARA	Area Sensitive
Treefrogs	*Hylidae*				
Gray Treefrog	*Hyla versicolor*				No
No. of Species Observed: 1		**0**	**0**	**0**	**0**

No. of Species Observed in Projec 1

Appendix E

Mammal Status Report

APPENDIX E Mammal Status Report

Mammal species observed by GHD are listed. These species are identified by the common and scientific name used by the Natural heritage information Centre (NHIC). Any significant status for a species on national and provincial lists is displayed as well as those from relevant regional lists.

List Status :	**END - endangered**	A wildlife species facing imminent extirpation or extinction.
	END-R -endangered regulated	A wildlife species facing imminent extirpation or extinction in Ontario which has been regulated under Ontario's Endangered Species Act (ESA).
	THR - threatened	A wildlife species likely to become endangered if limiting factors are not reversed.
	SC - special concern	A wildlife species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.
	YES - Area Sensitive	A wildlife species that requires large areas of suitable habitat in order to sustain their population numbers.

*** Other status levels are not displayed**

List Sources:	**COSEWIC**	The Committee on the Status of Endangered Wildlife in Canada, 2017.
	COSSARO	The Committee on the Status of Species at Risk in Ontario, 2017.
	SARA	Species At Risk Act, Schedule 1, Government of Canada, 2017.
	Area Sensitive	Significant Wildlife Technical Guide, Appendix C, OMNR, Oct. 2000

Common Name	Scientific Name	COSEWIC	COSSARO	SARA	Area Sensitive
White-tailed Deer	*Odocoileus virginianus*				No
Red Squirrel	*Tamiasciurus hudsonicus*				No
Eastern Cottontail	*Sylvilagus floridanus*				No
Coyote	*Canis latrans*				No
No. of Species Observed in Projec 4		**0**	**0**	**0**	**0**

Appendix F

Recommended Tree/Shrub Species for Compensation Area

Table 2. Recommended Native Tree and Shrub Species Code	**Plant Species**	**Scientific Name**	**Quantity**	**Stock**
Woodland edge and field	Bur oak	*Quercus rubra*	10	-2 gallon potted stock-120-150 cm whips -spacing at 5 m intervals
Woodland edge	White pine	*Pinus strobus*	10	1-2 gallon pots (20-30 cm) -spacing at 5 m intervals
field	snowberry	*Symphoricarpos albus*	50	-2 gallon potted stock-120-150 cm whips
field	Fragrant sumac	*Rhus aromatica*	30	-2 gallon potted stock-120-150 cm whips
field	Staghorn sumac	*Rhus Typhina*	60	1 gallon potted stock, 40-80 cm or Bare root (40-50 cm)
field	ninebark	Physocarpus opulifolius	30	1 gallon potted stock, 40-80 cm
field	Eastern red cedar	Juniperus virginiana	30	1 gallon potted stock, 40-80 cm
Wetland edge	Silver maple	*Acer saccharinum*	4	-2-3 gallon potted stock-120-150 cm whips
Wetland edge	Black willow	*Salix nigra*	3	-2-3 gallon potted stock-120-150 cm whips
Field and wetland edge	Red-osier dogwood	*Cornus stolonifera*	50	1 gallon potted stock, 40-80 cm or Bare root (40-50 cm)
Wetland edge	Red maple	*Acer rubrum*	6	-2 gallon potted stock-120-150 cm whips
Totals			**283**	

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The Power of Commitment