BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Natural Heritage Assessment White Church Secondary Plan Hamilton, ON

Prepared For:

Whitechurch Landowners Group Inc.

Prepared By:

Beacon Environmental Limited

Date: *Project:*

December 2023 **223152**

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1. Introduction

Beacon Environmental Limited (Beacon) was retained by the Whitechurch Landowners Group to complete a Natural Heritage Assessment for participating landowners within the White Church Secondary Pan Area in the City of Hamilton. The majority of the 326 hectare (ha) properties (hereafter referred to as Study Area) are bounded by Airport Road East to the north, Miles Road to the east, White Church Road East to the south and Upper James Street to the west. The location of the Secondary Plan Area and the Study Area which include the participating landholdings are shown on **Figure 1**.

The Study Area lands are comprised predominantly of agricultural lands. The northwest corner of the Study Area falls within the Airport Influence Area and outside of the Secondary Plan Area. The remainder of the lands fall within the Urban Expansion Area-Neighborhoods in the City's Official Plan. The natural heritage features mapped by the City of Hamilton on these properties are shown only on the Schedules of the Rural Hamilton Official Plan. Schedule B of the Rural Official Plan shows Core Areas of the Natural Heritage System on several of the properties within the Study Area. The Niagara Peninsula Conservation Authority (NPCA) mapping does not show any flood plain within the Study Area. However, several watercourses and associated regulated areas are identified on the NPCA mapping within the Study Area.

The purpose of the Natural Heritage Assessment is to characterize the natural heritage and hydrological features associated with the Study Area and to present the City's Natural Heritage System (NHS) that is consistent with current natural heritage planning policies, guidelines, and criteria. Detailed seasonal surveys will be required to confirm feature limits and to develop a natural heritage system, including linkages as required by the City of Hamilton.

The study area was within the City's Rural Area. It was added to the City's Urban Boundary in 2022 and then returned to the Rural Area in 2023. This Natural Heritage Assessment was prepared on the basis that the Study Area may be brought into the urban area of the City of Hamilton at some point in the future.

This report provides the findings of the seasonal surveys conducted on the participating properties as well as an overview of the remaining lands within the Secondary Plan area relying on background data.

2. Policy Review

This section provides a summary of environmental legislation, regulations and policies at the federal, provincial, and local level that would apply to the Study Area.

2.1 *Endangered Species Act* (2007)

The provincial *Endangered Species Act* (ESA, 2007) primarily protects species listed as Threatened or Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO). Threatened or Endangered species are protected, as is their habitat. Depending on the time of a species' listing, habitat is protected either under a General Habitat protection provision or a Species-Specific Habitat protection provision.

The ESA generally prohibits the killing or harming of a Threatened or Endangered species (Section 9), as well as the destruction of its habitat (Section 10). Where activities are likely to adversely affect Threatened or Endangered species or their habitat, permitting may be required under Section 17(2)(c) of the ESA.

2.2 Provincial Policy Statement (2020)

The Provincial Policy Statement (PPS) (MMAH 2020) provides policy direction to municipalities on matters of provincial interest as they relate to land use planning and development. The PPS provides for appropriate land use planning and development while protecting Ontario's natural heritage. Development governed by the *Planning Act* must be consistent with the policy statements issued under the PPS. These are outlined in Section 2.1 - Natural Heritage, Section 2.2 – Water, and Section 3.1 - Natural Hazards of the PPS, and relevant sections from each are provided in the following pages.

The PPS includes policies that speak to the identification and protection of natural heritage systems, as well as levels of protection for the various components that comprise such systems. Some of these features are present in the Study Area and must be assessed in the context of these policies.

The policies specific to natural heritage are found in Section 2.1 of the PPS and are provided in their entirety below:

2.1.1 Natural features and areas shall be protected for the long term.

2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

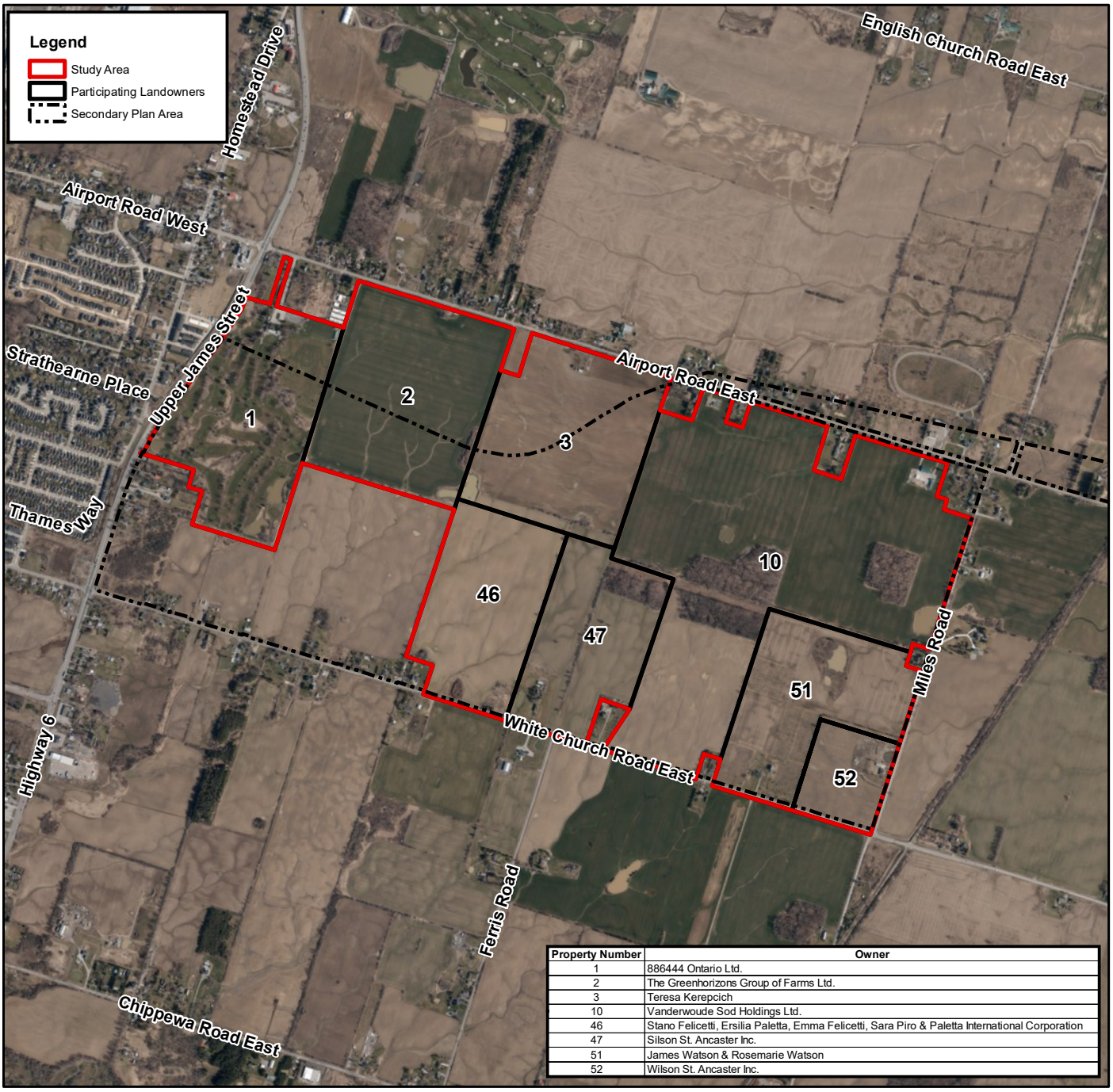
2.1.3 Natural heritage systems shall be identified in Ecoregions 6E & 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.

2.1.4. Development and site alteration shall not be permitted in:

- *a. Significant wetlands in Ecoregions 5E, 6E and 7E; 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 7E that are not subject to policy 2.1.4(b).*



Property Number	Owner
1	886444 Ontario Ltd.
2	The Greenhorizons Group of Farms Ltd.
3	Teresa Kerepcich
10	Vanderwoude Sod Holdings Ltd.
46	Stano Felicetti, Ersilia Paletta, Emma Felicetti, Sara Piro & Paletta International Corporation
47	Silson St. Ancaster Inc.
51	James Watson & Rosemarie Watson
52	Wilson St. Ancaster Inc.

Site Location	Figure 1
Whitechurch Secondary Plan Area NHA	
BEACON ENVIRONMENTAL	Project: 223152 Last Revised: December 2023
Client: Whitechurch Landowners Group Inc.	Prepared by: BD Checked by: SM
N 1:21,000	Inset Map:1:150,000

C:\ODB\OneDrive - Beacon Environmental\GeoSpatial\Geo Projects\2023\223152 Mount Hope Secondary Plan Extension Area EIS\MXD\2023-08-01_Figure01_SiteLocation_223152.mxd

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 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 on their ecological functions.

2.1.9 Nothing in policy 2.1 is intended to limit the ability of agricultural uses to continue.

Of these features, PSWs and significant ANSIs are identified directly by the MNRF. Woodlands are identified using MNRF criteria, and other significant features may be identified using MNRF criteria or municipal criteria that meet the same standard. In Ontario, Fisheries and Oceans Canada (DFO) manages fish habitat and the MNRF manages fisheries. Habitat of endangered and threatened species is mainly governed by the provincial ESA.

2.3 Green Belt Plan (2017)

This Natural Heritage Assessment was prepared on the basis that the Study Area lands are outside the Greenbelt Plan Area and therefore not subject to the policies of the Greenbelt Plan.

2.4 City of Hamilton Urban Official Plan

The northwest corner of the Study Area is currently located outside the Urban Boundary within the Airport Influence Area. The remainder of the lands north of White Church Road East fall within the Urban Expansion Area-Neighborhoods. This Natural Heritage Assessment report was prepared on the basis of the Study Area being brought into the urban area at some point in the future and subject to the policies of the City's Urban Official Plan.

Section C.2.0 of the City's Urban Official Plan contains policies pertaining to the protection of the Natural Heritage Systems (NHS) in the urban area of the City of Hamilton.

The Natural Heritage System consists of Core Areas, Linkages, and the matrix of lands between them which may be suitable for restoration. Core Areas include key natural heritage features, key hydrologic features, and associated vegetation protection zones.

Minor refinements to the boundaries of Core Areas may occur through Environmental Impact Statements, watershed studies or other appropriate studies accepted by the City of Hamilton without an amendment to the Plan.

The following are policy excerpts relevant to natural heritage features on the Study Area:

C.2.3.3 Any development or site alteration within or adjacent to Core Areas shall not negatively impact their environmental features or ecological functions.

C.2.5.2 New development and site alteration shall not be permitted within provincially significant wetlands, significant coastal wetlands or significant habitat of threatened and endangered species.

C.2.5.3 New development and site alteration shall not be permitted within fish habitat, except in accordance with provincial and federal requirements.

C.2.5.4 New development and site alteration shall not be permitted within significant woodlands, significant wildlife habitat, significant valleylands, and significant areas of natural and scientific interest it has been demonstrated that there shall be no negative impacts on the natural features or their ecological functions.

C.2.5.5 New development or site alteration shall not be permitted on adjacent land to the natural heritage features and aeras identified in Sections C.2.3.2 to C.2.5.4 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there shall be no negative impacts on the natural features or on their ecological functions.

C.2.5.7 Streams are mapped in Schedule B - Natural Heritage System. Streams have been separated into two classes: Coldwater Watercourse/Critical Habitat and Warmwater Watercourse/Important/Marginal Habitat. If the stream has not been classified as part of an EIS, subwatershed study, or other study, a scoped EIS is required to determine the classification.

C.2.5.8 New development or site alteration subject to Policies C.2.5.3 to C.2.5.7 requires, prior to approval, the submission and approval of an Environmental Impact Statement which demonstrates to the satisfaction of the City and the relevant Conservation Authority that:

a) There shall be no negative impacts on the Core Area's natural features or their ecological functions.
b) Connectivity between Core Areas shall be maintained, or where possible, enhanced for the movement of surface and ground water, plants and wildlife across the landscape.
c) The removal of other natural features shall be avoided or minimized by the planning and design of the proposed use or site alteration wherever possible.

C. 2.5.9 An Environmental Impact Statement shall propose a vegetation protection zone which:

a) has sufficient width to protect the Core Area and its ecological functions from impacts of the proposed land use or site alteration occurring during and after construction, and where possible and deemed feasible to the satisfaction of the City, restores or enhances the Core Area and/or its ecological functions; and
b) is established to achieve, and be maintained as natural self-sustaining vegetation.

2.5.10 Where vegetation protection zone widths have not been specified by watershed and sub-watershed plans, secondary, Environmental assessments and other studies, the following vegetation protection zone widths shall be evaluated and addressed by Environmental Impact Statements. Other agencies, such as Conservation Authorities, may have different vegetation protection zone requirements.

a) Coldwater Watercourse and Critical Habitat – 30-metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel.

b) Warmwater Watercourse and Important and Marginal Habitat – 15 metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel.

c) Provincially Significant Wetlands – 30-metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources.

d) Unevaluated wetlands – Unevaluated wetlands and locally significant wetlands require a 15 metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources, unless an Environmental Impact Statement recommends a more appropriate vegetation protection zone.

e) Woodlands – 10-metre vegetation protection zone, measured from the edge (drip line) of the woodland.

f) Significant woodlands – 15-metre vegetation protection zone, measured from the edge (drip line) of the significant woodland.

g) Areas of Natural and Scientific Interest (ANSIs) – Life and Earth Science ANSIs require a 15-metre vegetation protection zone.

h) Significant Valleylands – As required by the relevant Conservation Authority.

i) Significant Habitat of Threatened or Endangered Species and Significant Wildlife Habitat: the minimum vegetation protection zone shall be determined through Environmental Impact Statements, dependent on the sensitivity of the feature.

C.2.5.11 Vegetation protection zone widths greater or less than those specified in a) to i) above may be required if ecological features and functions warrant it, as determined through an approved Environmental Impact Statement. Widths shall be determined on a site-specific basis, by considering factors such as the sensitivity of the habitat, the potential impacts of the proposed land use, the intended function of the vegetation protection zone, and the physiography of the site.

C.2.5.12 Permitted uses within a vegetation protection zone shall be dependent on the sensitivity of the feature, and determined through approved studies. Generally, permitted uses within a vegetation protection zone shall be limited to low impact uses, such as vegetation restoration, resource management, and open space. Permitted uses within the vegetation protection zone shall be the same uses as those within the Core Area in Policy C.2.5.1 and the vegetation protection zone should remain in or be returned to a natural state.

C.2.5.13 All plantings within vegetation protection zones shall use only non-invasive plant species native to Hamilton. The City may require that applicants for development or site alteration develop a restoration or management plan for the vegetation protection zone as a condition of approval.

Section 2.7 of the Urban Official Plan contains policies applicable to Linkages. Linkages are natural areas within the landscape that ecologically connect Core Areas. Linkages are a component of the Natural Heritage System shown on Schedule B of the Official Plan.

> *C.2.7.5 Where new development or site alteration is proposed within a Linkage in the Natural Heritage System as identified in Schedule B – Natural Heritage System, the applicant shall prepare a Linkage Assessment. On sites where an Environmental Impact Statement (EIS) is being prepared, the Linkage Assessment can be included as part of the EIS report. Any required Linkage Assessment shall be completed in accordance with Policy F.3.2.1.11 - Linkage Assessments.*
>
> *C.2.7.6 Linkage Assessments shall include the following information:*
>
> *a) identify and assess the Linkage including its vegetative, wildlife, and/or landscape features or functions;*
>
> *b) assess the potential impacts on the viability and integrity of the Linkage as a result of the development proposal; and,*
>
> *c) make recommendations on how to protect, enhance or mitigate impacts on the Linkage(s) and its functions through planning, design and construction practices.*
>
> *C.2.7.7 In addition to the Linkages identified on Schedule B – Natural Heritage System, there may be Hedgerows that are worthy of protection, especially where:*
>
> *a) they are composed of mature, healthy trees and generally provide a wide, unbroken linkage between Core Areas;*
>
> *b) there is evidence that wildlife regularly use them as movement corridors or habitat;*
>
> *c) they contain tree species which are threatened, endangered, special concern, provincially or locally rare; or,*
>
> *d) groupings of trees which are greater than 100 years old.*

2.5 Niagara Peninsula Conservation Authority (NPCA)

NPCA regulates land use activities in and adjacent to wetlands and natural hazards, including areas subject to or at risk of flooding and erosion (e.g., watercourses, floodplains, and valleylands) under Ontario Regulation 150/06 (*Regulation for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*) of the *Conservation Authorities Act*. NPCA's policy document (2022) provides direction on how the authority administers and implements Ontario Regulation 150/06.

There are ongoing changes to the *Conservation Authorities Act* associated with Ontario's Bill 23 (*More Homes Built Faster Act*, 2022), which revokes the individual regulations set out for each conservation authority. A new generic regulation is proposed by the province, which will specify the requirements that apply to all conservation authorities across the province.

One regulation (Ontario Regulation 686/21) is already in force which focuses the scope of the conservation authorities to regulations specifically associated with flooding and natural hazards. In this regard, it is understood that NPCA will review a project related to the risk associated with natural hazards, including watercourses and wetlands, within its jurisdiction and in accordance with Ontario Regulation 155/06 until a new generic regulation comes into effect.

3. Methodology

The following sections describe the various field investigations and analyses undertaken to characterize the biophysical functions and significant ecological features associated with the Study Area.

3.1 Background Review

Background information was gathered and reviewed at the outset of the project. This involved consideration of the following documents or information sources relevant to the Study Area:

- Current and historic aerial imagery;
- Provincially Tracked Species data from Land Information Ontario (LIO);
- Ontario Breeding Bird Atlas;
- Ontario Reptile and Amphibian Atlas;
- Natural Heritage Information Centre (NHIC) Data via the Make-A-Map application;
- Species at risk range maps https://www.ontario.ca/environment-and-energy/species-risk-ontario-list;
- Natural and physical feature layers from LIO, including wetlands and watercourses with thermal regime; and
- Physiography of Southern Ontario (Chapman and Putnam 1984).

3.2 Field Investigations

Field investigations of terrestrial natural heritage features on the Study Area were conducted throughout 2023 by Beacon's team of ecologists specializing in terrestrial and aquatic inventory and assessment protocols. Surveys included Ecological Land Classification (ELC), flora inventories, breeding bird surveys, Headwater Drainage Feature Assessments (HDFA) and aquatic habitat assessments. The following sections describe the field survey methodologies. Survey types and dates are summarized in **Table 1.**

Table 1. Summary of Field Surveys and Dates

Survey Type	Dates of Surveys
Ecological Land Classification and Flora Inventory	August 9, 17 and 25, 2023
Breeding Bird Surveys	June 5, 6, 7, 23, 24 and 25, and July 8, 2023
Amphibian Surveys	May 23, June 19 and 26, 2023
Headwater Drainage Feature & Aquatic Habitat Assessments	April 6 and June 6, 2023

3.2.1 Headwater Drainage Features Assessment

Two rounds of surveys were conducted in 2023 on April 6 and June 6. A third round was not required as flow conditions were dry in all identified reaches during the round 2 survey. Further field investigations are required in 2024 to assess the watercourses identified on the additional parcels.

An assessment of the drainage features within the Study Area was completed in accordance with TRCA's *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (2014). Drainage features were characterized based on flow regime, form, riparian vegetation, fish and fish habitat, and terrestrial habitat. Each drainage feature reach was evaluated individually based on each of these parameters and assigned a rating of important, valued, contributing, or limited based on functional significance. These ratings were then used to determine an overall management recommendation for each reach based on the following categories:

- *Protection* – Important Functions: i.e., swamps with amphibian breeding habitat; perennial headwater drainage features; seeps and springs; Species at Risk (SAR) habitat; permanent fish habitat with woody riparian cover;
- *Conservation* – Valued Functions: i.e., seasonal fish habitat; with woody riparian cover; marshes with amphibian breeding habitat; or general amphibian habitat with woody riparian cover;
- *Mitigation* – Contributing Functions: i.e., contributing fish habitat with meadow vegetation or limited cover;
- *Recharge Protection* – Recharge Functions: i.e., features with no flow with sandy or gravelly soils;
- *Maintain or Replicate Terrestrial Linkage* – Terrestrial Functions: i.e., features with no flow with woody riparian vegetation and connects two other natural features identified for protection; and
- *No Management Required* – Limited Functions: i.e., features with no or minimal flow; cropped land or no riparian vegetation; no fish or fish habitat; and no amphibian habitat.

Speculative management recommendations were provided for the unassessed watercourses based on background information and data collected from the ELC surveys.

3.2.2 Ecological Land Classification

Ecological communities in the Study Area were mapped and classified in accordance with the protocols of the Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.* 1998). Communities were surveyed in the summer of 2023 (see **Table 1** for specific dates).

3.2.3 Flora Inventory

A flora inventory was completed for the Study Area on the above noted dates. A list was compiled of all observed vascular plant species. Follow-up visits will be conducted in spring and fall 2024 to complete the 3-season flora inventory in accordance with the City's requirements.

3.2.4 Breeding Bird Surveys

Two rounds of breeding bird surveys were conducted on the Study Area lands on June 5, 6, 7, 2023 (Round 1) and June 23, 24 and 25, 2023 (Round 2), in the early mornings (start times between 6:40 and 7:25), when temperatures were within 5^{o} C of seasonal norms, and without precipitation or persistent winds given their potential interference with survey results. The breeding bird community was surveyed by walking all parts of the Study Area to within 50 m of all habitats to document individuals

and breeding evidence. Species were noted as confirmed or probable breeders, or migrants. All observations were noted on an aerial photograph of the site.

An additional survey was completed on July 8, 2023, specifically surveying the open meadow and grassland areas for the grassland bird species at risk, Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*). Thus, the areas with suitable habitat for these species were surveyed three times, whereas the remainder of the habitat had two survey visits.

3.2.5 Amphibian Surveys

Two rounds of evening surveys were conducted within the subject area (Parcels 1, 2, 3, 10, 46, 47, 51, and 52) to survey for breeding amphibians. These surveys took place on May 23, and June 19, 2023. Another evening survey was completed on June 26, 2023, for additional properties (Parcels 55, 56, 57, and 58). Twenty-one survey locations within the subject area were placed in proximity to wetland habitat considered suitable to support breeding amphibians (**Figure 2**). The surveys were conducted as per the protocol outlined in the Great Lakes Marsh Monitoring Program (Bird Studies Canada, 2009). Surveys consisted of auditory surveys undertaken during the prime breeding period to record calling males that are present, spread throughout the breeding season to include the short temporal peak for each species of interest. The surveys involved visiting the site after dusk when minimum night-time air temperatures of at least 5°C during the first visit, 10°C during the second visit and 17°C during the third visit. The first survey, when minimum night-time air temperatures of at least 5°C, was not completed due to timing of project approval. All surveys for all properties will be completed in 2024, if required. Calling amphibians, if present, were identified to species and chorus activity was assigned a code from the following options:

0 No calls;
1 Individuals of one species can be counted, calls not simultaneous;
2 Some calls of one species simultaneous, numbers can be reliably estimated and shown in brackets; and
3 Full chorus, calls continuous and overlapping.

3.2.6 Desktop Species at Risk Habitat Screening

A desktop review of available information sources was undertaken to determine potential species at risk. As part of the desktop screening, the following information sources were reviewed:

- Natural Heritage Information Centre (NHIC) Data via the Make-A-Map application;
- Databases of the Ontario Breeding Bird Atlas (OBBA) project;
- Ontario Reptile and Amphibian Atlas (ORAA);
- SAR range maps https://www.ontario.ca/environment-and-energy/species-risk-ontario-list;
- Aquatic SAR maps http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm;
- High Resolution aerial photography of the property; and
- Natural and physical feature layers from Land Information Ontario (LIO).

The information sources referenced above were reviewed in a Geographic Information System (GIS) mapping environment that Beacon uses to assess the likelihood that sensitive fish habitat or potential endangered or threatened species are present in an area of interest. This system allows Beacon to combine the most current information provided by MNRF through the LIO portal with GIS layers from

provincial floral and faunal atlases. All relevant layers can then be overlaid on the most recent high resolution ortho-imagery. The screening process helps identify areas that can then be targeted (for example, potential habitat) during field assessment to maximize the efficiency and effectiveness of on-site investigations.

3.2.7 Species at Risk Habitat Assessment

An assessment of the property was conducted for potential habitat for endangered or threatened species known to occur in the general vicinity of the Study Area based on NHIC records, wildlife atlases, recovery strategies, and other background resources.

4. Existing Conditions

4.1 Aquatic Resources

There is a watershed divide within the Study Area and drainage features are associated with the Twenty Mile Creek and Upper Welland River watersheds (**Figure 2**). Drainage features (DF) 1 through 8 were assessed in 2023. DFs 9 through 22 are additional watercourses that were identified by MNRF mapping within the extended study area and will be subject to future assessments.

The Twenty Mile Creek watershed is the second largest watershed within the jurisdiction of the (NPCA, and it is located in the City of Hamilton, and the Regional Municipality of Niagara including the Town of Lincoln, Township of West Lincoln, and Town of Grimsby (NPCA 2006). The total drainage of the watershed is 291 square kilometres. Drainage Features (DF) 1 through 5 located in the northeast portion of Parcel 10 are associated with the main branch of the Twenty Mile Creek subwatershed.

The Upper Welland River watershed has a total drainage of 480 square kilometres. DFs 6 through 22 are associated with the Welland River West subwatershed (Local Management Area 2.1). Area 2.1 includes the entire headwaters region of the Welland River, Lake Niapenco, and downstream to the confluence of Elsie Creek and the Welland River (NPCA 2011).

4.1.1 Fish and Fish Habitat

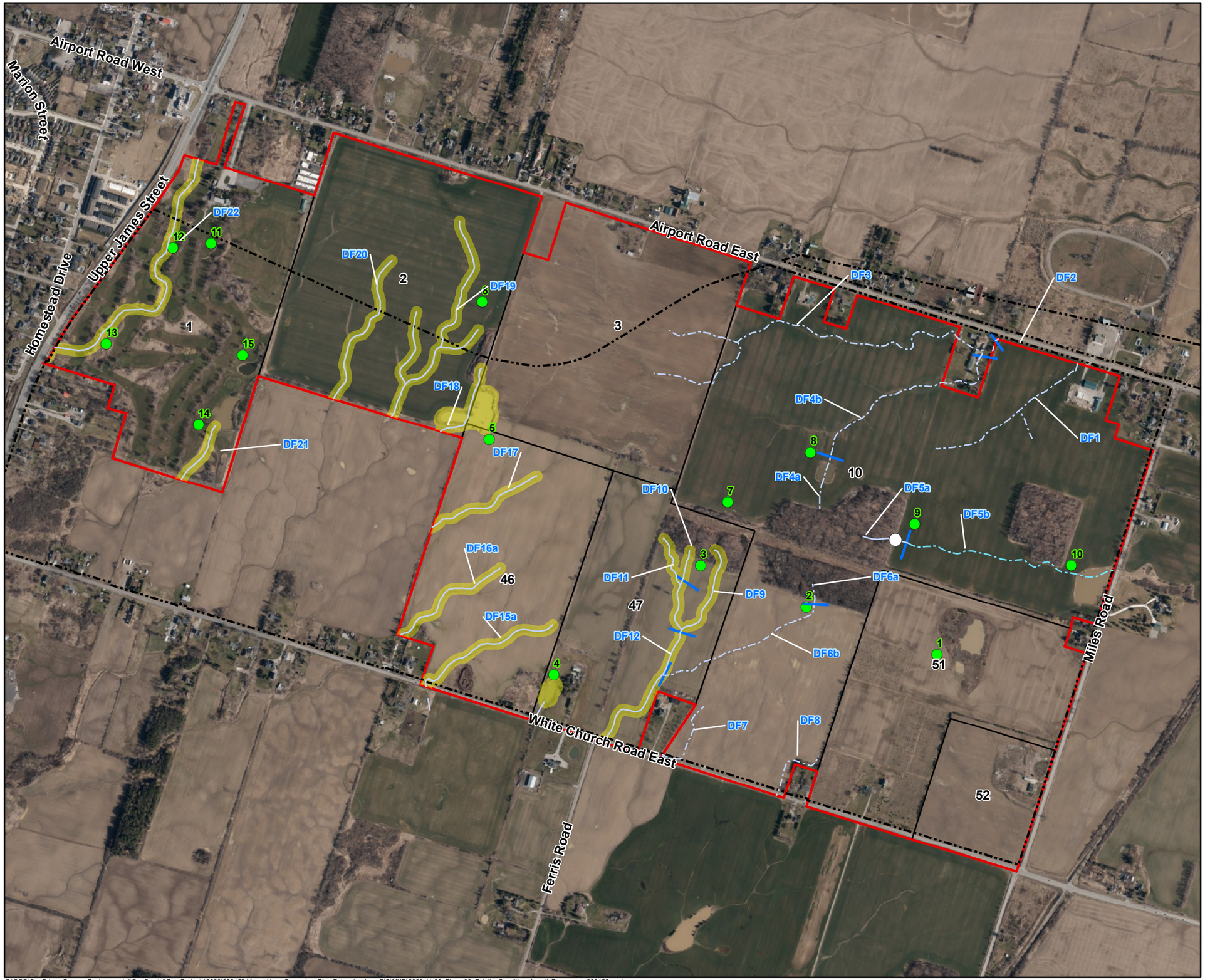
All watercourses assessed in 2023 were ephemeral headwaters that did not contain fish or fish habitat. Fisheries and Oceans Canada (DFO) Mapping identified Grass Pickerel (*Esox americanus vermiculatus*) within the Welland River watershed in the extended study area. The Grass Pickerel is listed provincially as Special Concern and is found in wetlands, ponds, slow-moving streams and shallow bays of larger lakes with warm, shallow, clear water and an abundance of aquatic plants (Government of Ontario, 2014). DFO Mapping shows the potential for Grass Pickerel to occur in DFs 14 and 15. However, it is unlikely for them to occur due to those reaches as they are likely first order watercourses with ephemeral hydrology. Further field investigations are required to confirm the potential for fish and fish habitat within these watercourses.

NPCA conducted sampling in 2007 at five stations in the Welland River headwaters , ranging 21 km upstream from the Binbrook reservoir. Species caught were Black Bullhead (*Ameiurus melas*), Black

Existing Conditions - Aquatic Resources

Figure 2

Whitechurch Secondary Plan Area NHA



Legend

- Study Area (326 ha)*
- Parcel Boundaries*
- Secondary Plan Area
- Watercourse (MNRF 2023)
- Further Study (15.50 ha)
- Tiled Drainage Feature
- Headwater Drainage Features
- Drain
- Reach Break
- Amphibian Sample Locations

*Boundaries are approximate

BEACON ENVIRONMENTAL

Project: 223152
Last Revised: December 2023

Client: Whitechurch Landowners Group Inc.

Prepared by: BD
Checked by: SA

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Crappie (*Pomoxis nigromaculatus*), Bluntnose Minnow (*Pimephales notatus*), Brown Bullhead (*Ameiurus nebulosus*), Central Mudminnow (*Umbra limi*), Common Carp (*Cyprinus carpio*), Grass Pickerel (*Esox americanus vermiculatus*), Green Sunfish (*Lepomis cyanellus*), Golden Shiner (*Notemigonus crysoleucas*) Johnny Darter (*Etheostoma nigrum*), Largemouth Bass (*Micropterus nigricans*), Northern Pike (*Esox lucius*), Pumpkinseed (*Lepomis gibbosus*), Tadpole Madtom (*Noturus gyrinus*), White Crappie (*Pomoxis annularis*), White Sucker (*Catostomus commersonii*), Yellow Bullhead (*Ameiurus natalis*), and Yellow Perch (*Perca flavescens*) (NPCA 2011). It is possible that these species have migrated into the shallow aquatic habitats identified with DFs 21 and 22 on the Parcel 1 golf course. Further field investigations are required to confirm the potential for fish and fish habitat within these watercourses.

4.1.2 Headwater Drainage Feature Assessment

Headwater drainage feature assessments were completed on the participating properties at the time of seasonal surveys (i.e. Parcels 13 and 10). Surveys on the remaining properties will be completed in 2024 and this report relies on background information for Parcels 1,-3, 46, 47, 55 - 58.

In total, eight headwater drainage features (HDFs) were identified and assessed in 2023 (**Figure 2**). All features were first or second order streams that exhibited ephemeral flow and lacked defined banks. HDFs were assessed following the Ontario Stream Assessment Protocol Headwater Drainage Feature Module (Stanfield et al. 2014). All features were flowing during the Round 1 assessment with the exception of DF7, which was not present. All features were found to be dry or contain only standing water during the Round 2 assessment. A third round assessment was not deemed necessary based on the initial findings.

DFs) 1, 2, 3, 4 and 5 are associated with the Twenty Mile Creek watershed. DF1 had two branches which originated in the Parcel 10 agricultural field and drained into the roadside ditch along Airport Road East (DF2). DF3 originated in the Parcel 3 agricultural field and flowed eastward into Parcel 10. It then flowed eastward through the neighbouring property and into the roadside ditch (DF2). DF4 originated within the Parcel 10 agricultural field and drains into an online irrigation pond (**Photographs 1 & 2**). It continued flowing northeast to the neighbouring property where it connected with DF3. DF5a gathered flow from vernal pools within the forested area located in the central area of Parcel 10 and exited the forested area into a tile drain. The tile drain flowed eastward toward the irrigation retention pond along the east perimeter of the study area.

DFs 6, 7 and 8 are part of the Welland River watershed and all originate within Parcel 10. DF6a originated within the wooded area where a series of vernal pools outlet into the agricultural field (DF6b) (**Photographs 3 & 4**). If flows southwest into Parcel 47, which was not part of the 2023 study. DF7 did not exist or was disrupted by agricultural activities. DF8 gathered overland drainage from the surrounding agricultural field and flowed south to the roadside ditch along White Church Road East.

4.1.1 Drainage Feature Recommendations

All features assessed had flow present during the Round 1 assessment except for DF7, which was not present and does not require any management. An HDF recommendations summary can be found in **Table 2.**

DF1, DF3, DF4b and DF8 were found to be dry during the Round 2 investigation. DF2 was found to have standing water in isolated pools during the Round 2 investigation. These features did not have terrestrial habitat or riparian vegetation and can be mitigated through lot-level low impact developments (LIDs).

DF4a was an online pond associated with the DF4 reach. It remains wet year-round and supports breeding amphibians. Further hydrogeology studies are required to determine the hydrology of the pond, however it is assumed that the pond is used as a retention pond for crop irrigation. Due to the likely anthropogenic alteration of the pond, Beacon recommends that the pond be decommissioned, and its hydrology mitigated through LIDs.

DF5a was found to have standing water in isolated vernal pools during the Round 2 investigation. This watercourse provided habitat for breeding amphibians. The riparian vegetation was classified as deciduous forest (FOD6-5) by the ELC investigation. It is the recommendation of the HDFA guideline and Beacon that this feature be protected.

DF5b was found to be dry during the Round 2 investigation. It is recommended by the HDFA guideline and Beacon that this feature is mitigated to maintain linkage the DF5a watercourse, proper drainage of the vernal pools, and connection to downstream features.

DF6a was found to have standing water in isolated vernal pools during the Round 2 investigation. This watercourse provided habitat for breeding amphibians. The riparian vegetation was classified as deciduous forest by the ELC (FOD6-5). It is the recommendation of the HDFA guideline and Beacon that this feature be protected.

DF6b was found to be dry during the Round 2 investigation. It is recommended by the HDFA guideline and Beacon that this feature be mitigated to maintain linkage the DF6a watercourse, proper drainage of the vernal pools, and connection to downstream features.

Table 2. Summary of Drainage Feature Mitigation Recommendations

Drainage Feature Segment	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	HDFA Management Recommendations	Beacon Management Recommendations
DF1	Contributing	None	Limited	Not Applicable	Limited	Mitigation	Mitigation
DF1a	Contributing	None	Limited	Not Applicable	Limited	Mitigation	Mitigation
DF2	Contributing	Drainage Ditch	Limited	Not Applicable	Limited	Mitigation	Mitigation
DF3	Contributing	None	Limited	Not Applicable	Limited	Mitigation	Mitigation
DF4a	Valued	Online Pond	Limited	Not Applicable	Important	Conservation	Mitigation
DF4b	Contributing	None	Limited	Not Applicable	Limited	Mitigation	Mitigation
DF5a	Contributing	None	Important	Not Applicable	Important	Protection	Protection
DF5b	Contributing	Tiled Feature	Limited	Not Applicable	Limited	Mitigation	Mitigation
DF6a	Valued	None	Important	Not Applicable	Important	Protection	Protection
DF6b	Recharge	None	Limited	Not Applicable	Limited	Maintain Recharge	Maintain Recharge
DF7	None	None	None	Not Applicable	None	No Management Required	No Management Required
DF8	Contributing	None	Limited	Not Applicable	Limited	Mitigation	Mitigation

Photograph 1. Upstream View of DF4, Taken During Round 1 (April 6, 2023)

Photograph 2. Upstream View of DF4, Taken During Round 2 (June 6, 2023)

Photograph 3. Downstream View of DF6b, Taken During Round 1 (April 6, 2023)

Photograph 4. Downstream View of DF6b, Taken During Round 2 (June 6, 2023)

4.1.2 Unassessed Features

In total, 14 additional DFs have been identified on the surrounding parcels (**Figure 2**). These features are listed in **Table 3** and were not assessed by Beacon ecologists in 2023. The classifications provided for the drainage features are the anticipated classifications based on the ELC data collected and provincial watercourse mapping (**Figure 3**). Further field investigations are required to determine the headwater classification of each DF. DFs identified may not exist or follow the outlined path as background data has yet to be field verified, further additional DFs may be identified following the completion of seasonal surveys. This assessment does not identify hazards in relation to the floodplain.

It is expected that all DFs would qualify as ephemeral hydrology as they are identified in provincial watercourse mapping. Features that originate within farm fields and have no valued terrestrial or aquatic habitat are expected to be classified as mitigation and would likely be mitigated through the implementation of LIDs. Features that the ELC had identified as having aquatic habitat such as meadow, marsh, swamp, or shallow aquatic are considered to be conservation/protection as they may provide valued hydrology, terrestrial habitat, and potential fish habitat.

Table 3. Anticipated HDF Classifications for Unassessed Watercourses

Drainage Feature	Anticipated Classification	Notes
DF9	Conservation/Protection	Connected to upstream wetland in forested area
DF10	Conservation/Protection	Connected to upstream wetland in forested area
DF11	Conservation/Protection	Connected to upstream wetland in forested area
DF12	Conservation/Protection	Connected to upstream wetland in forested area
DF13	Conservation/Protection	Connected to marsh (MAS)
DF14	Conservation/Protection	Connected to online pond and multiple marshes (MAS)
DF15a	Mitigation	Farm field swale with contributing hydrology
DF15b	Conservation/Protection	Multiple marshes identified within the reach
DF16a	Mitigation	Farm field swale with contributing hydrology
DF16b	Conservation/Protection	Marsh (MAS2) and meadow (CUM) identified within reach
DF17	Mitigation	Farm field swale with contributing hydrology
DF18	Conservation/Protection	Online pond connected to meadow (CUM1-1)
DF19	Mitigation	Farm field swale with contributing hydrology
DF20	Mitigation	Farm field swale with contributing hydrology
DF21	Conservation/Protection	Shallow aquatic features (SAS and SAF), as well as meadow (CUM) identified within reach
DF22	Conservation/Protection	Watercourse originates upstream of site. Multiple meadow (CUM), shallow aquatic (SAM), and swamp (SWD) habitats identified within reach.

4.2 Ecological Communities

Vegetation communities were mapped and described following the protocols of the Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.* 1998). This involves delineating vegetation communities on aerial photographs and recording species composition and abundance for each vegetation community. Information on dominant species cover, community structure, level of disturbance, presence of indicator species, vascular plant species and other notable features are also

recorded. Both native and non-native species that were encountered were noted and are listed in **Appendix A**.

The ELC groups vegetation communities into two broad categories, naturally occurring communities, and cultural communities. Cultural communities represent vegetated areas that support a plant community that has been strongly influenced by human activities, both past and present, for example the naturalization of a fallowed agricultural field. Vegetation communities on the Study Area are illustrated in **Figure 4.**

Natural Communities

Fresh – Moist Sugar Maple Hardwood Forest (FOD6-5)

This community is found in two locations on Parcel10 of the Study Area. Typical of fresh to moist communities a mixture of upland and wetland species are common due to the presence of ephemeral ponds within the forest. Hence, some wetland species such as Jewelweed (*Impatiens capensis*), Fox Sedge (*Carex vulpinoidea*), and Bladder Sedge (*Carex intumescens*) were also observed. The canopy is primarily comprised of mature Sugar Maple (*Acer saccharum*) in association with Basswood (*Tilia americana*), Shagbark Hickory (*Carya ovata*) and Black Walnut (*Juglans nigra*). Sugar Maple is also dominant in the sub-canopy in association with other trees of mixed ages, including American Beech (*Fagus grandifolia*), Basswood, White Ash (*Fraxinus americana*), and a rare occasion of Ironwood (*Ostrya virginiana*), The understory is sparse and comprised of a mix of White Ash, Choke Cherry (*Prunus virginiana*), and American Beech. The abundance of the last two species varies between polygons. Other species contributing to the diversity of the understory include Ironwood (*Ostrya virginiana*), and Musclewood (*Carpinus caroliniana*), but these species are found in low numbers. The ground layer is equally dominated by Broadleaf Enchanter's Night Shade (*Circea canadensis*), and Rough Avens (*Geum laciniatum*), with occasional patches of Poison Ivy (*Toxicodendron radicans*).

Dry - Fresh Sugar Maple – Beech Deciduous Forest (FOD5 - 2)

This community is found on Parcels10 and47. This community is dominated by mature Sugar Maple and American Beech. The canopy is predominantly Sugar Maple in association with American Beech, Shagbark Hickory, and Eastern Cottonwood, as well as rare occurrences of Red Oak and Black Cherry. Sugar Maple and American Beech are also equally dominant in the sub-canopy, with Ironwood and Basswood contributing to its diversity. The understory is dominated by Gray Dogwood and Choke Cherry in association with young Ironwood trees. The ground layer is sparse and dominated by patches of Poison Ivy (*Toxicodendron radicans*), and Thicket Creeper (*Parthenocissus vitacea*), but occasionally Frost Aster (*Symphyotrichum pilosum*) stems are found in areas with canopy breaks.

Ephemeral Ponds

Several small ponds (<0.5 ha) are situated within the Fresh Moist Sugar Maple Harwood Forest and a few in Dry – Fresh Sugar Maple – Beech Forest. Most of these ponds are vegetated, but a few are unvegetated (open water). The plant forms vary from floating to emergent broadleaf and narrowleaf. Three types of vegetation communities are common in these forests. Jewelweed Mineral Shallow Marsh (*MAM2-9*) dominated by Jewelweed in association with Bladder Sedge and Hope Sedge (*Carex lupulina*). *False Nettle Mineral Shallow Marsh* (*MAM2*) dominated by False Nettle (*Boehmeria*

Existing Conditions - Terrestrial Resources

Figure 3

Whitechurch Secondary Plan Area NHA

Legend

- Study Area (326 ha)*
- Parcel Boundaries*
- Secondary Plan Area
- Ecological Communities
- Watercourse (MNRF 2023)
- Tiled Drainage Feature
- Headwater Drainage Features

Code	Wetland Communities
MAM2	Mineral Meadow Marsh
MAM	Meadow Marsh
MAM1	Bedrock Meadow Marsh
MAM2-9	Jewelweed Mineral Meadow Marsh
MAS2	Mineral Shallow Marsh
MAS2-1	Cattail Mineral Shallow Marsh
SWD4	Mineral Deciduous Swamp
SWD4-1	Willow Mineral Deciduous Swamp
	Aquatic Communities
OA	Open Water
P (Offline)	Pond
P (Online)	Pond
SA	Shallow Water
SAF1-3	Duckweed Floating-leaved Shallow Aquatic
SAM1	Mixed Shallow Aquatic
SAM1-2	Duckweed Mixed Shallow Aquatic
SAS1-2	Waterweed Submerged Shallow Aquatic
	Forest Communities
FOD6-5	Fresh-Moist Sugar Maple - Hardwood Deciduous Forest
FOD5-2	Dry - Fresh Sugar Maple - Beech Deciduous Forest
	Cultural Communities
CUM1	Mineral Cultural Meadow
CUM1-1	Dry - Moist Old Field Meadow
CUW1	Mineral Cultural Woodland
CUT	Cultural Thicket
CUM	Cultural Meadow
CUW	Cultural Woodland
	Other Communities
AG	Agricultural
ANT	Anthropogenic
HE	Hedgerow

*Boundaries are approximate

BEACON ENVIRONMENTAL

Project: 223152
Last Revised: December 2023

Client: Whitechurch Landowners Group Inc.

Prepared by: BD
Checked by: SA

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Natural Heritage System – City of Hamilton Official Plan

Figure 4

Whitechurch Secondary Plan
Area NHA

Legend

- Study Area (326 ha)*
- Parcel Boundaries*
- Secondary Plan Area
- Core Areas**
  (Rural Hamilton Official Plan Schedule B, 2013)
- Key Hydrologic Feature Lakes and Littoral Zones***
  (Rural Hamilton Official Plan Schedule B-5)
- Key Hydrologic Features Streams****
  (Rural Hamilton Official Plan Schedule B-8)

*Boundaries are approximate
**Note: Significant Woodlands Shown with a 15 m buffer per the Urban Hamilton Official
***Note: Key Hydrologic Feature Lakes and Littoral Zones Shown with a 15 m buffer per the Urban Hamilton Official Plan
****Key Hydrologic Features Streams shown with a 30 m buffer per the Urban Hamilton Official Plan

BEACON ENVIRONMENTAL

Project: 223152
Last Revised: December 2023

Client: Whitechurch Landowners Group Inc.

Prepared by: BD
Checked by: SM

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cylindrica) but Jewelweed, Hope Sedge (*Carex lupulina*), and Sensitive Fern (*Onoclea sensibilis*) are notable. Reed Canary Grass Mineral Shallow Marsh (*MAS2*) dominated by Reed Canary Grass (*Phalaris arundinacea*) with occasional Hope Sedge and Sallow Sedge (*Carex lurida*). Common Duckweed (*Lemna minor*) is the most common floating species in the open water areas of these ponds. Non-carex emergent species Rice-cut Grass (*Leersia oryzoides*) and Broadleaf Cattail (*Typha latifolia*) are also common in both communities.

Mineral Swamp Communities (SWD)

Trembling Aspen Mineral Deciduous Swamp Type (SWD 4)

This community is situated in the southeastern portion of the Sugar Maple–Beech forest on Parcel47. This swamp is dominated by a mixed age stand of Trembling Aspen (*Populus tremuloides*) in association with American Elm (*Umus americana*) in its canopy and sub-canopy. Its understory is comprised of a mix of Silky Dogwood (C*ornus obliqua*), Meadow Sweet (*Spirea alba*), and Trembling Aspen as well as rare occurrences of American Elm. Wetland obligate species, Common Hope Sedge is dominant in the ground layer, but other species such as Fox Sedge, Lanceleaf Aster (*Symphyotrichum lancaeolatum*) and Reed Canary Grass also contribute to the ground layer diversity.

Willow Mineral Deciduous Swamp Type (SWD 4-1)

Two polygons of this community are situated along the drain west of Parcel1 (**Figure 2A**). The canopy of this swamp is dominated by Crack Willow (*Salix X fragilis*) with rare occasions of Silver Maple (*Acer saccharinum*). The sub-canopy is sparse and dominated by Crack Willow. Silky Dogwood is the most common understory species but mixed with Common Buckthorn (*Rhamnus catharica*) and Tatarian Honey Suckle (*Lonicera tatarica*), especially on the edges of the swamp. The ground layer is comprised of a mixture of Jewelweed, Narrowleaf Cattail (*Typha latifolia*), and American Bugleweed (*Lycopus americanus*) on the banks of the drain. Tatarian Honeysuckle saplings are also notable in the peripheries of the swamp.

Mineral Marsh Communities (MAM)

These communities are associated with a network of drainage features that traverses all subject properties, but a few are associated with shallow ponds (Figures 2A – 2N). Two types of marsh communities were identified during the ELC surveys include:

Meadow Marsh/Mineral Meadow Marsh (MAM/MAM2)

This community is dominated almost entirely by Reed Canary Grass, with rare occasions of cattail species.

MAS2 Mineral Shallow Marsh/MAS2-1 Cattail Mineral Shallow Marsh (MAS2/MAS2-1)

This community is dominated almost entirely by Narrowleaf Cattail and Broadleaf Cattail mixed with Reed Canary Grass.

Cultural Communities (CU)

These communities are found throughout the subject properties and include meadows, thickets, and woodlands. The description of these communities is presented below.

Cultural Meadow/Dry - Moist Old Field Meadow (CUM1/CUM1-1)

These communities are found in all subject properties. Some occur as inclusions in the peripheries of ponds. Cultural meadow communities are often dominated by herbaceous species typically found in plant communities that were previously or recently influenced by human activity. Species such as Queen Ann's Lace (*Daucus carrota*), Redtop (*Agrostis gigantea*), and Reed Canary Grass (*Phalaris arundinacea*) are the most notable in the ground layer, but Common Milkweed (*Asclepias syriaca*) and Tall Goldenrod (*Solidago altissima*) occasionally present throughout the area. Saplings of Gray Dogwood, Hawthorn (Crataegus sp.), Staghorn Sumac (*Rhus typhina*), Silky Dogwood, as well as tree species including American Elm, Eastern Cottonwood (*Populus deltoides*) and White Ash (*Fraxinus americana*), are also present but on rare occasions.

Cultural Woodland/Mineral Cultural Woodland (CUW/CUW1)

Two polygons of this community type are found in Parcels1 & 3 (**Figure 2A and 2B**). This successional community dominated by a mix of mid-age and young poplar trees. Trembling Aspen is dominant species in the sub-canopy and the understory; but Staghorn Sumac and non-native the European Buckthorn and Black Locust also comprise the understory. In contrast, the canopy is sparse and comprised of mature Silver Maples. The ground layer is typical of the pioneer communities, dominated by species often found in cultural meadows these include Redtop, Tall Goldenrod and Lanceleaf Aster. Other ground layer species include Rough Avens, Field Strawberry (*Fragaria virginana*), Heal-all (*Prunella vulgaris*), and Riverbank Grape (*Vitis riparia*) scattered among Tall Goldenrod and Lanceleaf Aster patches.

Mineral Cultural Thicket (CUT)

Two polygons of this community type are situated in the southern portions of Parcel56. This community is comprised mostly of Grey Dogwood with Hawthorn species. Dogwood is the most notable of two shrubs in the understory. Wild Raspberry and Tall Goldenrod are the most common herbaceous species in the ground layer.

Aquatic communities

These communities are found in shallow water ponds associated with the drain network that traverses the subject properties. Most of these ponds are vegetated, but a few are unvegetated (i.e., open water). The dominant plant forms are floating and submergent, but emergent broadleaf and narrowleaf also occur. The aquatic communities identified during ELC surveys are as follows:

Open Water/Open Aquatic (OA/OAO)

These are shallow water unvegetated ponds.

SAF1-3 Duckweed Floating-leaved Shallow Aquatic

This community is dominated by floating emergent Common duckweed, but non-carex broadleaf emergent species such as Rice-cut Grass, Reed Canary Grass, and Broadleaf Cattail are also found in very shallow ends of the pond. Other species include Purple Loosestrife (*Lythrum salicaria*), American Bugleweed, and Riverbank Grape which form a vegetation cover on the banks. A few shrub species such as Sandbar Willow (*Salix interior*) and Red Osier Dogwood (*Cornus sericea*) form the understory but are rare within this community.

Mixed Shallow Aquatic/Duckweed Mixed Shallow Aquatic (SAM1/SAM1-2)

This community is dominated by Common Duckweed in association with submergent Canadian Waterweed (*Elodea canadensis*). Broadleaf Cattail, Narrowleaf Cattail, and Rice-cut Grass are occasional in the edges of water. The Mixed Shallow Aquatic community composition is similar to the Duckweed Mixed Shallow Aquatic but has a notable abundancy of algae species.

SAS1-2 Waterweed Submerged Shallow Aquatic

This community is dominated by Canadian Waterweed, but its banks are covered with broadleaf wetland species such as Fox Sedge, Common Beggar-ticks (*Bidens frondosa*), and American Bugleweed.

Hedgerow (*HE*)

Hedgerows occur on all properties within the subject lands, but the species composition varies between properties. These communities often support a mix of shrub species, including Common Buckthorn, Downy Hawthorn (*Crataegus mollis*), Gray Dogwood (*Corns racemosa*), Silky Dogwood, Tatarian Honey Suckle, and Staghorn Sumac. They also support an array of tree species, including Freeman's Maple (*Acer X fremanii*), Sugar Maple, Shagbark Hickory, White Spruce (*Picea glauca*), and Trembling Aspen. The ground cover is represented by a mix of native and non-native species such as Fox Sedge, Tall Goldenrod, Garlic Mustard (*Alliaria petiolata*), Redtop, Lanceleaf Aster, Grassleaf Goldenrod (*Euthamia graminifolia*), and Queen Ann's Lace.

4.3 Flora

A total of 203 vascular plant species were recorded in the study area during ELC surveys conducted by Beacon on August 09, 17, and 25, 2023. Of these, 139 (68%) of the species are considered native to Ontario, and 64 (32%) are non-native to Ontario, which is reflective of the agricultural land use history of the study area. 138 of the native species are considered provincially common and secure (ranked S5 or S4 provincially by NHIC), one species is considered rare to uncommon Pignut Hickory (*Carya glabra*), and one doesn't have an S-Ranking (SNA). The remaining 63 species are considered provincially exotic (SE). Additionally, the Carolinian Zone species list ranked 113 of the species as

common (C), and 2 species as rare (R); these are Pignut Hickory and Switch Grass (*Panicum virgatum*). Similar to the NHIC raking, 63 of the species are considered introduced (I), and 25 do not have any rank. A plant list is included in **Appendix A.**

4.4 Breeding Birds

A total of 50 species of breeding birds were observed to be breeding in the Study Area (**Appendix B**). This species diversity is reflective of the habitat present dominated by agricultural areas in addition to areas of woodland, wetland and meadow as discussed in the preceding sections. Observations were made throughout the study area however were largely concentrated within the woodlands and hedgerows.

The avian community was comprised mostly of generalist and open habitat species, with some edge and forest specialists. The most numerous species included Red-winged Blackbird (*Agelaius phoeniceus*), American Robin (*Turdus migratorius*), Song Sparrow (*Melospiza melodia*), and Savannah Sparrow (*Passerculus sandwichensis*). These species had total territories ranging between 96 and 28. Other species with multiple observations, however in less abundance, included Brown-headed Cowbird (*Molothrus ater*), European Starling (*Sturnus vulgaris*), Yellow Warbler (*Setophaga petechia*), and American Goldfinch (*Spinus tristis*).

In addition to the woodland species, the wetland communities on the subject property supported several species that typically rely on or are closely associated with wetland habitats to fulfill their life cycle. Such species included: Yellow Warbler (*Setophaga petechia*), Common Yellowthroat, Red-winged Blackbird, Spotted Sandpiper (*Actitis macularia*), Swamp Sparrow (*Melospiza georgiana*), Mallard (*Anas platyrhynchos*), Green Heron (*Butorides virescens*), and Willow Flycatcher (*Empidonax traillii*).

The open landscape which dominated the Study Area supported both agricultural and grassland elements, and supported birds such as Savannah Sparrow, Vesper Sparrow (*Pooecetes gramineus*), Killdeer (*Charadrius vociferus*), and Song Sparrow.

As discussed in the preceding sections, a number of hardwood forests were delineated on the property and subsequently supported woodland specialist birds. These included Rose-breasted Grosbeak (*Pheucticus ludovicianus*), Red-bellied Woodpecker (*Melanerpes carolinus*), Northern Flicker (*Colaptes auratus*), Eastern Wood-Pewee (*Contopus virens*), and Carolina Wren (*Thryothorus ludovicianus*).

Area-sensitive birds are those that require larger tracts of suitable habitat in which to breed or are those that have a higher breeding success in larger areas of suitable habitat. Three such species were recorded. Two of these were considered to be forest-sensitive species: White-breasted Nuthatch (*Sitta carolinensis*) and American Redstart (*Setophaga ruticilla*). The remaining species, Savannah Sparrow, was considered a grassland area-sensitive species. Three territories of White-breasted Nuthatch were recorded, two of American Redstart, and 28 of Savannah Sparrow.

No species provincially ranked as S1 through S3 (Critically Imperiled through Vulnerable) were recorded nesting, nor were any nesting species regulated under the ESA. Bank Swallow was documented foraging during a breeding bird survey, however, it is unlikely to be nesting anywhere on the properties as no open bank nesting habitat for burrowing was observed. Eastern Wood-Pewee (*Contopus virens*) is listed as Special Concern, and Barn Swallow (*Hirundo rustica*) is listed as Special Concern and both were recorded within the Study Area.

Three territories of Eastern Wood-Pewee were recorded in three wooded valleyland areas on property 10a, 10b and 10c. Though this species is special concern provincially and federally based on a declining trend over their range, these birds remain relatively common in both urban and urbanizing woodlands. They are somewhat tolerant of forest fragmentation and will live in both edge habitats and forest interiors. Barn Swallows could be nesting on the outside or inside of any buildings on the property, and one building was noted as a likely nesting site on Parcel52. Bank Swallows were recorded solely foraging through the site and are not breeding as no open bank nesting habitat for burrowing was observed.

4.5 Reptiles and Amphibians

4.5.1 Breeding Amphibians

Stations 1-15 within the subject property were considered suitable wetland habitat to support breeding amphibians and were surveyed on May 23, and June 19, 2023. The first round of amphibian surveys in early spring as not completed as the timing window was missed, it will be completed in early spring 2024. Stations 16-21 were surveyed on June 26, 2023. Four anuran species were recorded from the stations. The following species were recorded vocalizing on site: Green Frog (*Lithobates clamitans*), American Toad (*Anaxyrus americana*), Gray Treefrog (*Dryophytes versicolor*), and Spring Peeper (*Pseudacris crucifer).* The results are presented below in **Table 4** and include the call code notation along with the number of individuals in brackets.

Table 4. Breeding Amphibian Survey Results

Station	**Visit 1** May 23	**Visit 2** June 19	**Additional Visit** June 26
1	GRTR – 3(2), SPPE – 1(3)	GRTR – 3, GRFR – 1(3), AMTO – 1(1)	N/A
2	-	-	N/A
3	-	-	N/A
4	GRTR – 2(4)	-	N/A
5	-	GRFR – 1(3)	N/A
6	-	-	N/A
7	SPPE – 1(1)	-	N/A
8	GRFR – 1(1)	GRFR – 1(5)	N/A
9	-	-	N/A
10	AMTO – 1(2), GRFR – 1(1)	GRTR* to Southeast	N/A
11	-	GRFR – 2(5), GRFR – 1(1)	N/A
12	GRFR – 1(1)	GRFR – 1(3)	N/A
13	GRFR – 1(3)	GRFR – 1(3)	N/A
14	GRFR – 1(4)	GRFR – 1(4)	N/A
15	-	GRFR – 1(1)	N/A
16	N/A	N/A	-
17	N/A	N/A	-
18	N/A	N/A	-
19	N/A	N/A	-
20	N/A	N/A	-

Station	Visit 1 May 23	Visit 2 June 19	Additional Visit June 26
21	N/A	N/A	GRTR – 1(1)

* = Call recorded from outside of station area
- = No frog calls recorded
N/A = Stations not surveyed
AMTO = American Toad, GRFR = Green Frog, GRTR = Gray Treefrog, SPPE = Spring Peeper

4.5.2 Reptiles

No reptiles were observed on the subject property during the field investigations summarized in this report. We note that this taxa can often be missed and that potential habitat is present for snake species such as, Eastern Gartersnake (*Thamnophis sirtalis sirtalis*), Dekay's Brownsnake (*Storeria dekayi*) and Red-bellied Snake (*Storeria occipitomaculata*).

Similarly, turtle species were not observed however the open aquatic and marsh communities may offer potentially suitable habitat for turtles, namely Snapping Turtle (*Chelydra serpentina*) and Midland Painted Turtle (*Chrysemys picta*) in this part of the province. Despite the lack of observations, suitable habitat is present that could support nesting and overwintering of these species.

4.1 Endangered or Threatened Species

As described in the preceding sections, Beacon staff conducted both desktop and on-site investigations to assess whether any endangered or threatened species were likely to occur on or within a 5-kilometer (km) radius of the subject property. **Table 5** provides Beacon's assessment based on the results of field and desktop investigations combined with knowledge of the habitat preferences and natural history of the species being considered.

Table 5. Endangered or Threatened Species

Species	Status on SARO List	Were Species and or/Habitat Documented during on-site Assessment?
Birds		
Acadian Flycatcher, *Empidonax virescens*	END	**No**, these birds nest in large mixed woodlands and were not detected during breeding bird surveys.
Bank Swallow, *Riparia riparia*	THR	**Yes**, a Bank Swallow was documented foraging during a breeding bird survey, however, it is unlikely to be nesting anywhere on the properties as no open bank nesting habitat for burrowing was observed.
Barn Owl, *Tyto alba*	END	**No,** this species generally nests in structures or mature tree hollows and were not detected during surveys. This species is understood to be exceptionally rare in Ontario.
Bobolink, *Dolichonyx oryzivorus*	THR	**No,** this species was not recorded during breeding bird surveys, as it requires extensive meadow habitat which is absent on the property.
Chimney Swift, *Chaetura pelagica*	THR	**No,** this species was not recorded during breeding bird surveys, and it is unlikely to be on property as suitable habitat, vertical columns, are absent.
Eastern Meadowlark, *Sturnella magna*	THR	**No,** this species was not recorded during breeding bird surveys, as it requires extensive meadow habitat which is absent on the property.
Louisiana Waterthrush, *Parkesia motacilla*	THR	**No,** this species was not documented during breeding bird surveys, and it is unlikely to be on property, as it is usually found in steep, forested ravines with fast-flowing streams, which are absent on the property.
Red-headed Woodpecker, *Melanerpes erythrocephalus*	END	**No,** none were documented during breeding bird surveys, suitable habitat includes open woodland, which is present on the property.
Short-eared Owl, *Asio flammeus*	THR	**No,** none were documented during field investigations, suitable habitat includes grasslands, which are present in the property, however the bulk of the property was agricultural.
Yellow-breasted Chat, *Icteria virens*	END	**No,** none were documented during field investigations, and suitable habitat is thickets and scrub, which is absent on the property.
Mammals		
Eastern Small-footed Myotis, *Myotis leibii*	END	**Potential**, suitable habitat for endangered bats is present in the treed communities on the subject property, based on the provincial habitat guidelines.
Little Brown Myotis, *Myotis lucifugus*	END	
Northern Myotis, *Myotis septentrionalis*	END	
Tri-coloured Bat, *Perimyotis subflavus*	END	
Aquatic Species		
Black Redhorse, *Moxostoma duquesnei*	THR	**No,** perennial watercourses and suitable habitat are absent in subject area. Suitable habitat may be present in extended 5-km radius.
Vascular Plants (Dicots)		
Butternut, *Juglans cinerea*	END	**No**, species was not recorded during field surveys, however, suitable habitat for Butternut is present in the edges of the treed communities and the hedgerows within the Study Area.
Spotted Wintergreen, *Chimaphila maculata*	THR	**No**, species was not recorded during field surveys, there are no dry-fresh oak dominated or Oak Pine Mixed forests within the Study Area.
Amphibians		
Jefferson's Salamander, *Ambystoma jeffersonianum*	END	**No**, suitable habitat for Jefferson's Salamander is not present due to absence of vernal pools.

Key: SARO Species at Risk in Ontario List EN: Endangered; THR Threatened; ORAA Ontario Reptile and Amphibian Atlas; NHIC Natural Heritage Information Centre

4.2 Significant Wildlife Habitat (SWH)

SWH designation is the responsibility of the planning authority and determination of it on a site-by-site basis is generally not an appropriate method to determine this constraint given that it is necessary to understand the context of the habitat within the local environment. In this case, the City of Hamilton has not identified SWH within their jurisdiction. There is guidance provided in two provincial documents: the Significant Wildlife Technical Guide (OMNR 2000), the Natural Heritage Reference Manual (MNRF 2010), and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015).

According to the Significant Wildlife Technical Guidelines (OMNR 2000), there are four main categories of Significant Wildlife Habitat (SWH):

- Seasonal Concentration Areas of Animals;
- Rare Vegetation Communities or Specialized Habitat for Wildlife;
- Habitat for Species of Conservation Concern; and
- Animal Movement Corridors.

Within each of these categories, there are multiple types of SWH, each intended to capture a specialized type of habitat that may or may not be captured by other existing feature-based categories (e.g., significant wetlands, significant woodlands).

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015) was used to screen for potential SWH. The analysis and results of this screening are presented in **Table 6**.

Table 6. Assessment of Potential Significant Wildlife Habitat Within Study Area

Wildlife Habitat Category	Presence or Absence on Subject Lands Based on MNRF Criteria for Ecoregion 6E	
	Absent	Potential Presence
Seasonal Concentration Areas for Wildlife Species		
Waterfowl Stopover and Staging Areas (Terrestrial)	X	
Waterfowl Stopover and Staging Areas (Aquatic)	X	
Shorebird Migratory Stopover Area	X	
Raptor Wintering Area	X	
Bat Hibernacula	X	
Bat Maternity Colonies		X (Potential)
Bat Migratory Stopover Area	X	
Turtle Wintering Areas		X (Potential)
Reptile Hibernaculum	X	
Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)	X	
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs)	X	
Colonially-Nesting Bird Breeding Habitat (Ground)	X	
Migratory Butterfly Stopover Areas	X	
Land bird Migratory Stopover Areas	X	
Deer Yarding Areas	X	
Deer Winter Congregation Areas	X	
Rare Vegetation Communities		
Cliffs and Talus Slopes	X	
Sand Barren	X	
Alvar	X	
Old Growth Forest	X	
Tallgrass Prairie	X	
Savannah	X	
Provincially Rare S1, S2 and S3 vegetation communities	X	
Regionally or Locally Rare vegetation communities	X	
Specialized Habitats of Wildlife		
Waterfowl Nesting Area	X	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	X	
Woodland Raptor Nesting Habitat	X	
Turtle Nesting Areas		X (Potential)

Wildlife Habitat Category	Presence or Absence on Subject Lands Based on MNRF Criteria for Ecoregion 6E	
	Absent	Potential Presence
Seeps and Springs		X (Potential)
Amphibian Breeding Habitat (Woodland)		X (Potential)
Amphibian Breeding Habitat (Wetlands)		X (Potential)
Woodland Area-Sensitive Bird Breeding Habitat	X	
Habitats of Species of Conservation Concern		
Marsh Bird Breeding Habitat	X	
Open Country Bird Breeding Habitat	X	
Shrub/Early Successional Bird Breeding Habitat	X	
Terrestrial Crayfish	X	
Special Concern and Rare Wildlife Species		X (Potential)
Animal Movement Corridors		
Amphibian Movement Corridors	X	
Deer Movement Corridors	X	

In summary, this analysis has considered that there are seven potential SWH types on the subject lands. Two of these are under the *Seasonal Concentration Areas for Wildlife Species* category and are: Bat Maternity Colonies, Turtle Wintering Areas. The bat category is presumed given the presence of suitable habitat, however, was not studied. Turtle wintering is limited to man-made irrigation ponds that are generally not considered SWH. Four of the potential SWH types are under *Specialized Habitats of Wildlife* and are: Turtle Nesting Areas and Amphibian Breeding Habitat (woodland and wetland); seeps and springs, seasonal surveys would be required to determine presence/absence of turtles and hydrogeological studies would be required to determine seeps and springs. One potential SWH category were under *Habitats of Species of Conservation Concern*: Special Concern and Rare Wildlife Species. This is in relation to Eastern Wood-pewee and Barn Swallow. The numbers of species observed during seasonal surveys do not warrant such a designation.

None of these areas have been identified as potential SWH by the City.

Some of the features identified as potential SWH based on consideration of the Ecoregional criteria have been included in the NHS.

4.3 Summary of Key Natural Features

Table 7 provides a summary of the natural heritage features that have been identified and which need to be addressed with respect to potential development impacts based on field investigations completed in 2023. It is acknowledged that additional field surveys are required and will be conducted in the appropriate timing windows in 2024.

Table 7. Summary of Natural Heritage Features

Feature	Key Functions and Attributes
Provincially Significant Wetlands	• Based on LIO data, no Provincially Significant Wetlands (PSW) have been identified by MNRF within the Study Area.
Other Wetlands	• Additional wetland units that were present through field surveys as well and are indicated as additional wetland units on **Figure 2**. • Botanical composition and characterization of the identified wetlands is provided under Section 4.2. • Wetland communities include all SWD and MAM communities.
Watercourses & Fish Habitat	• Two watercourses are present on the golf course lands on the western proportion of the property as well as within the Greenbelt lands. • Additional DFs are present which are ephemeral in nature as shown on **Figure 3.** • Man-made irrigation ponds are present on the property. • Fish Habitat is not present within the DFs. •
Significant Wildlife Habitat	• Potential SWH was identified for the following categories: ○ Amphibian breeding habitat (wetland); ○ Amphibian breeding habitat (woodland); ○ Bat maternity colonies; ○ Turtle nesting areas; ○ Turtle wintering areas ○ Seeps and springs;

Feature	Key Functions and Attributes
	• The confirmation of SWH is the responsibility of the municipality and therefore no confirmed SWH is discussed. This report notes the difference in treatment of the PSW units and built golf course ponds with respect to SWH.
Threatened and Endangered Species Habitat	Seasonal surveys have not confirmed the presence of the following threatened and endangered species within the Study Area. • Potential suitable habitat for endangered bats has been recorded in the treed communities on the subject property and will be subject to seasonal surveys should removals be proposed. • Discussion with MECP and DFO will be undertaken to ensure compliance with the ESA and SARA.
Significant Woodlands	• Based on the criteria set out by the City of Hamilton, significant woodlands are present within the Study Area including FOD communities.

4.4 City of Hamilton Natural Heritage System

The City of Hamilton Official Plan presents a Natural Heritage System which consists of the Niagara Escarpment Plan area, and Core Areas and Linkages identified by the City, based on requirements of the Provincial Policy Statement. The Natural Heritage System approach of the City of Hamilton involves delineating a Natural Heritage System which includes Core Areas, as well as supportive features (Linkages) that maintain the ecological functionality and connectivity of the natural system. The Natural Heritage System for the Study Area is shown on Schedule B of the Rural Hamilton Official Plan. This NHS is presented in accordance with the City's mapping on **Figure 4**. Refinements to the NHS will be proposed upon completion of seasonal surveys in 2024.

4.4.1 Environmentally Significant Areas

No Environmentally Significant Areas have been identified within the study area on the City of Hamilton Official Plan Mapping.

4.4.2 Aquatic Habitat and Drainage Features

Drainage features and associated aquatic habitat within the Study Area shown on Schedule B-8 of the Rural Hamilton Official Plan have been included within the proposed NHS (**Figure 4**).

4.4.3 Lakes and their Littoral Zones

Schedule B-5 of The City's Rural Official Plan identifies a number of "Lakes and their Littoral Zones" within the Study Area. These have been included within the proposed NHS (**Figure 4**).

4.4.4 Significant Woodlands

Significant Woodlands are generally depicted in Schedule B2 of the City's Official Plan. In the City of Hamilton, a woodland must meet at least two of the following criteria to qualify as significant:

- Size – Minimum patch size for significance is based on forest cover by planning unit:
  - < 5 % forest cover - 1 ha;
  - 5-10 % forest cover - 2 ha;
  - 11-15 % forest cover - 4 ha;
  - 16-20 % forest cover - 10 ha;
  - 21-30 % forest cover - 15 ha;
- Interior Forest - Woodlands that contain interior forest habitat. Interior forest habitat is defined as 100 metres from edge;
- Proximity/Connectivity - Woodlands that are located within 50 metres of a significant natural area (defined as wetlands 0.5 hectares or greater in size, ESAs, PSWs, and Life Science ANSIs);
- Proximity to Water - Woodlands where any portion is within 30 metres of any hydrological feature, including all streams, headwater areas, wetlands, and lakes;
- Age - Woodlands with trees of 100 years or more in age; and
- Rare Species - any woodland containing threatened, endangered, special concern, provincially or locally rare plant or wildlife species.

In determining significance, the Official Plan states that "woodlands shall meet a minimum average width of 40 metres."

Schedule B-2 of The City's Rural Official Plan identifies a number of "Significant Woodlands" within the Study Area. These woodlands identified by the OP have been included within the proposed NHS (**Figure 4**).

4.5 Buffers/Vegetation Protection Zones

The physical separation of development or land use changes from a natural feature (e.g., woodlands, wetlands, watercourses) using buffers or vegetated protection zones (VPZs) is often used for softening or reducing the impacts of land use changes on adjacent natural features (OMNR 2010). Buffers or VPZs can provide a number of benefits to natural features including reducing encroachments, reducing noise and light impact (particularly if the buffers contain dense vegetation), protecting root zones, enhancing woodland interior, and attenuating runoff (OMNR 2010).

While buffers or VPZs may sometimes be prescribed on the basis of policy, determining whether a buffer is required and/or establishing an appropriate buffer width requires consideration of the sensitivity of the feature and its ecological functions and the nature of the proposed change in adjacent land uses or activities. Buffers/VPZs are recommended based on their ability to protect existing natural features and their associated ecological functions from changes to adjacent land uses and activities. Buffers represent one of many tools available for mitigating impacts to natural heritage features.

Policy 2.5.10 of the City of Hamilton Urban Official Plan provides the following guidance for minimum vegetation protection zones.

> *2.5.10 Where vegetation protection zone widths have not been specified by watershed and sub-watershed plans, secondary, Environmental assessments and other studies, the following vegetation protection zone widths shall be evaluated and addressed by Environmental Impact Statements. Other agencies, such as Conservation Authorities, may have different vegetation protection zone requirements.*

a) Coldwater Watercourse and Critical Habitat – 30-metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel.
b) Warmwater Watercourse and Important and Marginal Habitat – 15 metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel.
c) Provincially Significant Wetlands – 30-metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources.
d) Unevaluated wetlands – Unevaluated wetlands and locally significant wetlands require a 15 metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources, unless an Environmental Impact Statement recommends a more appropriate vegetation protection zone.
e) Woodlands – 10-metre vegetation protection zone, measured from the edge (drip line) of the woodland.
f) Significant woodlands – 15-metre vegetation protection zone, measured from the edge (drip line) of the significant woodland.
g) Areas of Natural and Scientific Interest (ANSIs) – Life and Earth Science ANSIs require a 15-metre vegetation protection zone.
h) Significant Valleylands – As required by the relevant Conservation Authority.
i) Significant Habitat of Threatened or Endangered Species and Significant Wildlife Habitat: the minimum vegetation protection zone shall be determined through Environmental Impact Statements, dependent on the sensitivity of the feature.

Based on the sensitivity and ecological and hydrological functions of the core NHS components, the minimum MVPZs outlined above are considered appropriate for the Study Area; therefore, the following VPZ were applied:

- 15 m – Significant Woodlands;
- 15 m – Unevaluated/Locally Significant Wetlands;
- 10 m – Other Woodlands;
- 15 m – Warmwater Watercourses and Important or Marginal Fish Habitat; and
- 30 m – Cool or Coldwater Watercourses or Critical Fish Habitat.

It is recommended that VPZs be planted with native species to restore and enhance the ecological condition and function of the VPZs, particularly where they extend over previously disturbed areas such agricultural fields. VPZ should be preserved in a naturalized condition to maintain their protective ecological functions.

These buffers have been applied to the features identified by the OP on **Figure 4**. For the purposes of this report and in the absence of complete seasonal field data, Beacon has not recommended refinements to the EIS, this will be conducted as the project moves forward upon completion of field surveys.

4.6 Linkages

The importance of maintaining, and where possible improving, connections between and among protected natural features and areas, particularly in urbanizing settings, is well-recognized in the scientific literature (e.g., see papers cited in Environment Canada 2013).

The City of Hamilton Official Plan defines Linkages as natural areas within the landscape that ecologically connect Core Areas. Connections between natural areas provide opportunities for plant and animal movement, hydrological and nutrient cycling, and maintain ecological health and integrity of the overall NHS. It is intended that Linkages be protected, restored, and enhanced to sustain the Natural Heritage System wherever possible.

No linkage features have been identified within the Study Area in the Official Plan Mapping. Beacon will conduct a linkage assessment as part of the Environmental Impact Study to be prepared upon completion of field surveys and companion reports.

4.7 Restoration and Enhancement Areas

The City's Official Plan recognizes Core Areas, Linkages, "and the matrix of lands between them which may be suitable for restoration" as components of the NHS. This approach implements PPS natural heritage s. 2.1.2 which states that the: "The diversity and connectivity of natural features in an area … should be maintained, restored or, where possible, improved…" and the definition of Natural Heritage System which includes "...lands which have been restored or have the potential to be restored to a natural state…". These policies recognize that the ecological integrity of natural areas is often impaired due to land use transformations (e.g., clearing for agriculture or urbanization) and that in such areas, opportunities may exist to restore or enhance core areas of the NHS through a variety of management and stewardship measures either within or adjacent to core areas.

Restoration areas are not explicitly identified or mapped in the City's Official Plan and have not been addressed in this report. Should it be determined to be required as the project moves forward, Beacon will recommend restoration and enhancement opportunities as part of the Environmental Impact Study to be prepared upon completion of field surveys and companion reports.

4.8 Natural Hazard Constraints

Natural hazards, including areas prone to flooding and erosion, are not identified by the City of Hamilton as Core Areas of the NHS; however, such areas are regulated by the Grand River Conservation Authority and Section 3.1 of the PPS has policies governing development within and adjacent to natural hazards.

The NPCA mapping does not show any floodplain within the Study Area. This will be confirmed by the project engineer and incorporated into the NHS mapping should it be required.

5. Conclusion & Next Steps

Beacon was retained to undertake the necessary ecological investigations, analyses, and evaluations required to identify an NHS for the White Church Landowners group that is consistent with the Rural Hamilton Official Plan Schedules.

The assignment included some characterization of natural heritage and hydrological features and linkages within the study area, based on a review of the Rural Hamilton Official Plan mapping and some seasonal field investigations. A limited evaluation of their significance using provincial and municipal criteria and guidelines, and identification of a NHS in accordance with the goals, objectives and polices of the Provincial Policy Statement (PPS) and the City of Hamilton Official Plan was undertaken.

Based on information collected through the background review and field investigations, the ecological functions and significance of natural heritage and hydrologic features within the study area were described.

Key natural heritage and hydrological features mapped in the Rural Hamilton Official Plan were identified as Core Areas of the Natural Heritage System in accordance with the policies of the City of Hamilton Urban Official Plan. Supporting features including vegetation protection zones, linkages, and restoration/enhancement areas will be identified in a future Environmental Impact Statement to form a robust and sustainable NHS for the Study Area.

The Study Area supports several small, isolated woodlands, wetlands, agricultural ponds, and minor headwater drainage features that provide a lower level of ecological or hydrological functions and/or do not meet the provincial or municipal significance criteria of Core Areas.

The City of Hamilton Official Plan applies a systems approach to natural heritage system planning, which involves delineating a Natural Heritage System to include Core Areas and supportive features, such as linkages and restoration areas that maintain the ecological functionality and connectivity of the natural system. The NHS for the Study Area was delineated based on the Schedules of the Rural Hamilton Official Plan. Future refinements will be developed based on field studies completed as part of an Environmental Impact Statement in collaboration with planning and engineering consultants. Through this process, Beacon will provide input on natural heritage and hydrological constraints and restoration opportunities to inform a conceptual development plan (character plan) for the Study Area. In establishing the NHS within the context of the character plan, the focus will be on the maintenance and protection of key natural heritage and hydrological features, creating new or enhancing existing ecological and hydrological linkages, and providing areas for habitat restoration and enhancement.

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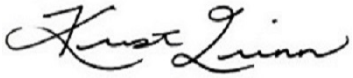

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Appendix A

Vascular Plant List

Appendix A

Vascular Plant List

Scientific Name	Common Name	Family	COSEWIC	SARO	SRank	Hamilton	Nat Status
Acer negundo	Manitoba Maple	Aceraceae			S5	C	N
Acer platanoides	Norway Maple	Aceraceae			SE5	IX	I
Acer saccharinum	Silver Maple	Aceraceae			S5	C	N
Acer saccharum	Sugar Maple	Aceraceae			S5	C	N
Acer x freemanii	(Acer rubrum X Acer saccharinum)	Aceraceae			SNA	hyb	N
Achillea millefolium	Common Yarrow	Asteraceae			SE5?	IX	I
Actaea pachypoda	White Baneberry	Ranunculaceae			S5	C	N
Agrostis gigantea	Redtop	Poaceae			SE5	IX	I
Alisma triviale	Northern Water-plantain	Alismataceae			S5	X	N
Alliaria petiolata	Garlic Mustard	Brassicaceae			SE5	IC	I
Ambrosia artemisiifolia	Common Ragweed	Asteraceae			S5	C	N
Ambrosia trifida	Great Ragweed	Asteraceae			S5	U	N
Amphicarpaea bracteata	American Hog-peanut	Fabaceae			S5	C	N
Anemone virginiana	Tall Anemone	Ranunculaceae			S5	C	N
Apocynum androsaemifolium	Spreading Dogbane	Apocynaceae			S5	C	N
Arctium lappa	Great Burdock	Asteraceae			SE5	IX	I
Arisaema triphyllum	Jack-in-the-pulpit	Araceae			S5	C	N
Asclepias syriaca	Common Milkweed	Apocynaceae			S5	C	N
Atriplex patula	Spear Saltbush	Chenopodiaceae			SE5	IU	I
Bidens cernua	Nodding Beggarticks	Asteraceae			S5	C	N
Bidens frondosa	Devil's Beggarticks	Asteraceae			S5	C	N
Boehmeria cylindrica	Small-spike False Nettle	Urticaceae			S5	C	N
Brassica nigra	Black Mustard	Brassicaceae			SE5	IR	I
Bromus inermis	Smooth Brome	Poaceae			SE5	IC	I
Carex bebbii	Bebb's Sedge	Cyperaceae			S5	C	N
Carex interior	Inland Sedge	Cyperaceae			S5	U	N
Carex intumescens	Bladder Sedge	Cyperaceae			S5	C	N

Scientific Name	Common Name	Family	COSEWIC	SARO	SRank	Hamilton	Nat Status
Carex lupulina	Hop Sedge	Cyperaceae			S5	C	N
Carex pedunculata	Long-stalked Sedge	Cyperaceae			S5	C	N
Carex pensylvanica	Pennsylvania Sedge	Cyperaceae			S5	C	N
Carex plantaginea	Plantain-leaved Sedge	Cyperaceae			S5	C	N
Carex rosea	Rosy Sedge	Cyperaceae			S5	C	N
Carex scoparia	Pointed Broom Sedge	Cyperaceae			S5	C	N
Carex tribuloides	Blunt Broom Sedge	Cyperaceae			S4	C	N
Carex vulpinoidea	Fox Sedge	Cyperaceae			S5	C	N
Carpinus caroliniana	Blue-beech	Betulaceae			S5	C	N
Carya glabra	Pignut Hickory	Juglandaceae			S3	R	N
Carya ovata	Shagbark Hickory	Juglandaceae			S5	C	N
Caulophyllum thalictroides	Blue Cohosh	Berberidaceae			S5	C	N
Cephalanthus occidentalis	Eastern Buttonbush	Rubiaceae			S5	C	N
Cichorium intybus	Wild Chicory	Asteraceae			SE5	IC	I
Cicuta maculata	Spotted Water-hemlock	Apiaceae			S5		N
Circaea canadensis	Broad-leaved Enchanter's Nightshade	Onagraceae			S5	C	N
Cirsium arvense	Canada Thistle	Asteraceae			SE5	IC	I
Cirsium vulgare	Bull Thistle	Asteraceae			SE5	IX	I
Collinsonia canadensis	Canada Horsebalm	Lamiaceae			S4	C	N
Cornus obliqua	Silky Dogwood	Cornaceae			S5	C	N
Cornus racemosa	Grey Dogwood	Cornaceae			S5	C	N
Cornus sericea	Red-osier Dogwood	Cornaceae			S5	C	N
Crataegus douglasii	Douglas' Hawthorn	Rosaceae			S4?		N
Crataegus mollis	Downy Hawthorn	Rosaceae			S4S5		N
Crataegus monogyna	English Hawthorn	Rosaceae			SE4	IX	I
Dactylis glomerata	Orchard Grass	Poaceae			SE5	IC	I
Daucus carota	Wild Carrot	Apiaceae			SE5	IC	I
Desmodium canadense	Canada Tick-trefoil	Fabaceae			S4	C	N
Dipsacus fullonum	Common Teasel	Dipsacaceae			SE5	IX	I
Echinochloa crus-galli	Large Barnyard Grass	Poaceae			SE5	IC	I
Elaeagnus umbellata	Autumn Olive	Elaeagnaceae			SE3	IX	I
Eleocharis erythropoda	Red-stemmed Spikerush	Cyperaceae			S5	C	N
Eleocharis obtusa	Blunt Spikerush	Cyperaceae			S5	C	N
Elodea canadensis	Canada Waterweed	Hydrocharitaceae			S5	C	N

Scientific Name	Common Name	Family	COSEWIC	SARO	SRank	Hamilton	Nat Status
Elymus hystrix	Bottlebrush Grass	Poaceae			S5	C	N
Epilobium ciliatum	Northern Willowherb	Onagraceae			S5		N
Epilobium coloratum	Purple-veined Willowherb	Onagraceae			S5	C	N
Erechtites hieraciifolius	Eastern Burnweed	Asteraceae			S5	U	N
Erigeron annuus	Annual Fleabane	Asteraceae			S5	C	N
Euonymus obovatus	Running Strawberry-bush	Celastraceae			S4	C	N
Eupatorium perfoliatum	Common Boneset	Asteraceae			S5	C	N
Eurybia macrophylla	Large-leaved Aster	Asteraceae			S5	C	N
Euthamia graminifolia	Grass-leaved Goldenrod	Asteraceae			S5	C	N
Fagus grandifolia	American Beech	Fagaceae			S4	C	N
Fragaria virginiana	Wild Strawberry	Rosaceae			S5		N
Fraxinus americana	White Ash	Oleaceae			S4	C	N
Fraxinus pennsylvanica	Red Ash	Oleaceae			S4	C	N
Geranium maculatum	Spotted Geranium	Geraniaceae			S5	C	N
Geranium robertianum	Herb-Robert	Geraniaceae			S5	C	N
Geum canadense	Canada Avens	Rosaceae			S5	C	N
Geum laciniatum	Rough Avens	Rosaceae			S4	C	N
Glechoma hederacea	Ground-ivy	Lamiaceae			SE5	IC	I
Glyceria septentrionalis	Eastern Mannagrass	Poaceae			S4	C	N
Hackelia virginiana	Virginia Stickseed	Boraginaceae			S5	C	N
Helianthus tuberosus	Jerusalem Artichoke	Asteraceae			SU	IX	N
Hesperis matronalis	Dame's Rocket	Brassicaceae			SE5	IC	I
Hordeum jubatum	Foxtail Barley	Poaceae			S5?		N
Hydrophyllum virginianum	Virginia Waterleaf	Hydrophyllaceae			S5	C	N
Hypericum perforatum	Common St. John's-wort	Clusiaceae			SE5	IC	I
Impatiens capensis	Spotted Jewelweed	Balsaminaceae			S5	C	N
Inula helenium	Elecampane	Asteraceae			SE5	IX	I
Iris versicolor	Harlequin Blue Flag	Iridaceae			S5	C	N
Juglans nigra	Black Walnut	Juglandaceae			S4?	C	N
Juncus dudleyi	Dudley's Rush	Juncaceae			S5	C	N
Juncus effusus	Soft Rush	Juncaceae			S5		N
Juncus tenuis	Path Rush	Juncaceae			S5	C	N
Juniperus virginiana	Eastern Red Cedar	Cupressaceae			S5	C	N
Lactuca serriola	Prickly Lettuce	Asteraceae			SE5	IX	I

Scientific Name	Common Name	Family	COSEWIC	SARO	SRank	Hamilton	Nat Status
Leersia oryzoides	Rice Cutgrass	Poaceae			S5	C	N
Lemna minor	Small Duckweed	Lemnaceae			S5?	C	N
Lepidium campestre	Field Peppergrass	Brassicaceae			SE5	IX	I
Ligustrum vulgare	European Privet	Oleaceae			SE5	IX	I
Lobelia cardinalis	Cardinal Flower	Campanulaceae			S5	C	N
Lolium perenne	Perennial Ryegrass	Poaceae			SE4	IC	I
Lonicera tatarica	Tatarian Honeysuckle	Caprifoliaceae			SE5	IX	I
Lotus corniculatus	Garden Bird's-foot Trefoil	Fabaceae			SE5	IC	I
Lycopus americanus	American Water-horehound	Lamiaceae			S5	C	N
Lythrum salicaria	Purple Loosestrife	Lythraceae			SE5	IC	I
Malus pumila	Common Apple	Rosaceae			SE4	IX	I
Matteuccia struthiopteris	Ostrich Fern	Dryopteridaceae			S5	C	N
Medicago lupulina	Black Medick	Fabaceae			SE5	IC	I
Melilotus albus	White Sweet-clover	Fabaceae			SE5	IC	I
Melilotus officinalis	Yellow Sweet-clover	Fabaceae			SE5	IC	I
Menispermum canadense	Canada Moonseed	Menispermaceae			S4	C	N
Mentha canadensis	Canada Mint	Lamiaceae			S5	C	N
Nepeta cataria	Catnip	Lamiaceae			SE5	IX	I
Onoclea sensibilis	Sensitive Fern	Dryopteridaceae			S5	C	N
Ostrya virginiana	Eastern Hop-hornbeam	Betulaceae			S5	C	N
Oxalis stricta	Upright Yellow Wood-sorrel	Oxalidaceae			S5	C	N
Panicum capillare	Common Panicgrass	Poaceae			S5	C	N
Panicum virgatum	Old Switch Panicgrass	Poaceae			S4	R	N
Parthenocissus vitacea	Thicket Creeper	Vitaceae			S5	C	N
Penthorum sedoides	Ditch Stonecrop	Crassulaceae			S5	C	N
Persicaria lapathifolia	Pale Smartweed	Polygonaceae			S5	C	N
Persicaria maculosa	Spotted Lady's-thumb	Polygonaceae			SE5	IC	I
Phalaris arundinacea	Reed Canarygrass	Poaceae			S5	C	N
Phleum pratense	Common Timothy	Poaceae			SE5	IC	I
Phragmites australis	Common Reed	Poaceae			S4?		N
Picea abies	Norway Spruce	Pinaceae			SE3	IR	I
Picea glauca	White Spruce	Pinaceae			S5	C	N
Picea pungens	Blue Spruce	Pinaceae			SE1	IR	I
Pilea pumila	Dwarf Clearweed	Urticaceae			S5	C	N

Scientific Name	Common Name	Family	COSEWIC	SARO	SRank	Hamilton	Nat Status
Pinus banksiana	Jack Pine	Pinaceae			S5	IR	N
Pinus strobus	Eastern White Pine	Pinaceae			S5	C	N
Pinus sylvestris	Scots Pine	Pinaceae			SE5	IX	I
Poa palustris	Fowl Bluegrass	Poaceae			S5	C	N
Poa pratensis	Kentucky Bluegrass	Poaceae			S5		N
Podophyllum peltatum	May-apple	Berberidaceae			S5	C	N
Populus deltoides	Eastern Cottonwood	Salicaceae			S5		N
Populus tremuloides	Trembling Aspen	Salicaceae			S5	C	N
Potentilla recta	Sulphur Cinquefoil	Rosaceae			SE5	IX	I
Prunella vulgaris	Common Self-heal	Lamiaceae			S5		N
Prunella vulgaris ssp. lanceolata	Lance-leaved Self-heal	Lamiaceae			S5	C	N
Prunus avium	Sweet Cherry	Rosaceae			SE4	IX	I
Prunus serotina	Black Cherry	Rosaceae			S5	C	N
Prunus virginiana	Chokecherry	Rosaceae			S5	C	N
Pyrus communis	Common Pear	Rosaceae			SE4	IX	I
Quercus rubra	Northern Red Oak	Fagaceae			S5	C	N
Reynoutria japonica	Japanese Knotweed	Polygonaceae			SE5	IX	I
Rhamnus cathartica	European Buckthorn	Rhamnaceae			SE5	IC	I
Rhus typhina	Staghorn Sumac	Anacardiaceae			S5	C	N
Ribes americanum	American Black Currant	Grossulariaceae			S5	C	N
Robinia pseudoacacia	Black Locust	Fabaceae			SE5	IC	I
Rosa multiflora	Multiflora Rose	Rosaceae			SE5	IC	I
Rosa rubiginosa	Sweetbriar Rose	Rosaceae			SE4		I
Rubus allegheniensis	Allegheny Blackberry	Rosaceae			S5	C	N
Rubus occidentalis	Black Raspberry	Rosaceae			S5	C	N
Rumex crispus	Curled Dock	Polygonaceae			SE5	IX	I
Salix amygdaloides	Peach-leaved Willow	Salicaceae			S5	C	N
Salix bebbiana	Bebb's Willow	Salicaceae			S5	C	N
Salix discolor	Pussy Willow	Salicaceae			S5	C	N
Salix eriocephala	Cottony Willow	Salicaceae			S5	C	N
Salix interior	Sandbar Willow	Salicaceae			S5	C	N
Salix x fragilis	(Salix alba X Salix euxina)	Salicaceae			SNA	hyb	I
Sambucus canadensis	Common Elderberry	Caprifoliaceae			S5	C	N

Scientific Name	Common Name	Family	COSEWIC	SARO	SRank	Hamilton	Nat Status
Schoenoplectus tabernaemontani	Soft-stemmed Bulrush	Cyperaceae			S5	C	N
Scirpus atrocinctus	Black-girdled Bulrush	Cyperaceae			S5		N
Scirpus cyperinus	Common Woolly Bulrush	Cyperaceae			S5	C	N
Setaria pumila	Yellow Foxtail	Poaceae			SE5	IX	I
Setaria viridis	Green Foxtail	Poaceae			SE5	IX	I
Sium suave	Common Water-parsnip	Apiaceae			S5	C	N
Solanum dulcamara	Bittersweet Nightshade	Solanaceae			SE5	IC	I
Solanum nigrum	Black Nightshade	Solanaceae			SE1	IR	I
Solidago altissima	Tall Goldenrod	Asteraceae			S5		N
Solidago flexicaulis	Zigzag Goldenrod	Asteraceae			S5	C	N
Solidago juncea	Early Goldenrod	Asteraceae			S5	C	N
Sonchus arvensis	Field Sow-thistle	Asteraceae			SE5	IX	I
Sorbus aucuparia	European Mountain-ash	Rosaceae			SE4	IX	I
Spiraea alba	White Meadowsweet	Rosaceae			S5	C	N
Symphyotrichum ericoides	White Heath Aster	Asteraceae			S5		N
Symphyotrichum lanceolatum	Panicled Aster	Asteraceae			S5	C	N
Symphyotrichum novae-angliae	New England Aster	Asteraceae			S5	C	N
Symphyotrichum pilosum	Old Field Aster	Asteraceae			S5		N
Syringa vulgaris	Common Lilac	Oleaceae			SE5	IR	I
Taraxacum officinale	Common Dandelion	Asteraceae			SE5	IC	I
Thelypteris palustris	Marsh Fern	Thelypteridaceae			S5	C	N
Thuja occidentalis	Eastern White Cedar	Cupressaceae			S5	C	N
Tilia americana	Basswood	Tiliaceae			S5	C	N
Toxicodendron radicans	Poison Ivy	Anacardiaceae			S5		N
Trifolium hybridum	Alsike Clover	Fabaceae			SE5	IC	I
Trifolium pratense	Red Clover	Fabaceae			SE5	IC	I
Triticum aestivum	Common Wheat	Poaceae			SE1	IR	I
Tussilago farfara	Coltsfoot	Asteraceae			SE5	IX	I
Typha angustifolia	Narrow-leaved Cattail	Typhaceae			SE5	IX	I
Typha latifolia	Broad-leaved Cattail	Typhaceae			S5	C	N
Ulmus americana	White Elm	Ulmaceae			S5	C	N
Urtica dioica	Stinging Nettle	Urticaceae			S5		N
Verbascum thapsus	Common Mullein	Scrophulariaceae			SE5	IC	I

Scientific Name	Common Name	Family	COSEWIC	SARO	SRank	Hamilton	Nat Status
Verbena hastata	Blue Vervain	Verbenaceae			S5	C	N
Veronica officinalis	Common Speedwell	Scrophulariaceae			SE5	IC	I
Viburnum acerifolium	Maple-leaved Viburnum	Caprifoliaceae			S5	C	N
Viburnum opulus ssp. trilobum	Highbush Cranberry	Caprifoliaceae			S5	C	N
Vicia cracca	Tufted Vetch	Fabaceae			SE5	IC	I
Viola pubescens	Yellow Violet	Violaceae			S5	C	N
Viola sororia	Woolly Blue Violet	Violaceae			S5	C	N
Vitis riparia	Riverbank Grape	Vitaceae			S5	C	N

KEY

S-Rank (from Natural Heritage Information Centre) for breeding status: S1 (Extremely Rare), S2 (Very Rare), S3 (Rare to Uncommon) (S4 (Common), S5 (Very Common) SNA (Not applicable…'because the species is not a suitable target for conservation activities'; includes non-native species), E (Exotic)

I introduced; thought to have been present in the Carolinian Zone or individual CZ area prior to European settlement; believed to be deliberately or inadvertently introduced to the CZ by humans (followed by a status, below)

C common
N Native
U uncommon
R rare
H historic records only (generally >30 years)
X present; status unknown or not specified in source lists
? unconfirmed report
hyb hybrid

Appendix B

Breeding Bird List

Appendix B

Breeding Bird List

Common Name	Scientific Name	Status				# Breeding Pairs/ Territories[4]
		COSEWIC[1]	COSSARO[2]	SRANK[3]	Area Sensitive?	
Mallard	*Anas platyrhynchos*			S5		3
Mourning Dove	*Zenaida macroura*			S5		13
Killdeer	*Charadrius vociferus*			S5		13
Spotted Sandpiper	*Actitis macularius*			S5		3
Green Heron	*Butorides virescens*			S4		1
Great Blue Heron	*Ardea herodias*			S5		F
Turkey Vulture	*Cathartes aura*			S4		F
Red-tailed Hawk	*Buteo jamaicensis*			S5		F
Downy Woodpecker	*Dryobates pubescens*			S5		3
Red-bellied Woodpecker	*Melanerpes carolinus*			S4		3
Northern Flicker	*Colaptes auratus*			S4		4
Eastern Wood-Pewee	*Contopus virens*	Special Concern	Special Concern	S4		3
Willow Flycatcher	*Empidonax traillii*			S5		4
Great Crested Flycatcher	*Myiarchus crinitus*			S5		6
Eastern Kingbird	*Tyrannus tyrannus*			S5		7
Warbling Vireo	*Vireo gilvus*			S5		4
Red-eyed Vireo	*Vireo olivaceus*			S5		5
Common Raven	*Corvus corax*			S5		1
American Crow	*Corvus brachyrhynchos*			S5		2
Blue Jay	*Cyanocitta cristata*			S5		5
Black-capped Chickadee	*Poecile atricapillus*			S5		7
Horned Lark	*Eremophila alpestris*			S5		10
Tree Swallow	*Tachycineta bicolor*			S5		2
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*			S5		2
Bank Swallow	*Riparia riparia*	Threatened	Threatened	S5		F
Barn Swallow	*Hirundo rustica*	Threatened	Special Concern	S5		12
Cliff Swallow	*Petrochelidon pyrrhonota*			S5		1

Common Name	Scientific Name	Status				# Breeding Pairs/ Territories[4]
		COSEWIC[1]	COSSARO[2]	SRANK[3]	Area Sensitive?	
White-breasted Nuthatch	*Sitta carolinensis*			S5	x	3
House Wren	*Troglodytes aedon*			S5		5
Carolina Wren	*Thryothorus ludovicianus*			S4		2
European Starling	*Sturnus vulgaris*			SNA		16
Gray Catbird	*Dumetella carolinensis*			S5		10
Chipping Sparrow	*Spizella passerina*			S5		8
Field Sparrow	*Spizella pusilla*			S5		4
Vesper Sparrow	*Pooecetes gramineus*			S4		3
Savannah Sparrow	*Passerculus sandwichensis*			S5	x	28
Song Sparrow	*Melospiza melodia*			S5		95
Swamp Sparrow	*Melospiza georgiana*			S5		1
Orchard Oriole	*Icterus spurius*			SZB		2
Baltimore Oriole	*Icterus galbula*			S4		9
Red-winged Blackbird	*Agelaius phoeniceus*			S5		96
Brown-headed Cowbird	*Molothrus ater*			S5		27
Common Grackle	*Quiscalus quiscula*			S5		16
American Robin	*Turdus migratorius*			S5		85
Cedar Waxwing	*Bombycilla cedrorum*			S5		9
Common Yellowthroat	*Geothlypis trichas*			S5		2
Yellow Warbler	*Setophaga petechia*			S5		19
American Redstart	*Setophaga ruticilla*			S5		2
House Finch	*Haemorhous mexicanus*			SE		6
American Goldfinch	*Spinus tristis*			S5		17
Northern Cardinal	*Cardinalis cardinalis*			S5		8
Indigo Bunting	*Passerina cyanea*			S5		4
Rose-breasted Grosbeak	*Pheucticus ludovicianus*			S5		1
House Sparrow	*Passer domesticus*			SNA		7

[1]Committee on the Status of Endangered Wildlife in Canada
[2]Committee on the Status of Species at Risk in Ontario
[3]Provincial Conservation Status: S4=Apparently Secure, S5=Secure, SNA=Status Not Applicable
[4]F=Flyover (not breeding on property)