Appendix C

Environmental Assessment and Natural Heritage System

NATURAL HERITAGE CHARACTERIZATION ASSESSMENT
BLOCK 1 LANDS - CITY OF HAMILTON

Prepared for:

Fruitland-Winona Block 1 Owners

Prepared by:

Colville Consulting Inc.

File: C18028
Date: April 2024

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Colville Consulting Inc. was retained to prepare a Natural Heritage Characterization Assessment for lands identified as in the City of Hamilton. This assessment has been prepared to describe natural heritage features located on t he Subject Lands, with the intent of determining the extent of potential Core Areas, Linkages and Restoration Areas, as described in the Urban Hamilton Official Plan. A summary of our assessment is included below.

1.1 Description of the Subject Property

The Block 1 lands are generally defined by Fruitland Road to the west, Barton Street to the north, Highway 8 to the south, and Watercourse 6 (which runs roughly parallel to and just to the east of Jones Road) to the east. The Subject Lands of this assessment collectively measure approximately 101 hectares (295 acres) in size and are primarily anthropogenic in nature, with houses and other developments (including a cemetery) occurring along all four of the major roads.

As a majority of lands within the study area were formerly tender fruit orchards and vineyards, which were subsequently modified for residential, agricultural, industrial and institutional uses or left to undergo succession. Current land uses within the Block consist primarily of current and former agricultural lands, along with successional fields, scattered and isolated treed areas, thickets, hedgerows and disturbed wetlands.

Natural heritage features currently identified within these lands consist of Watercourse 5, which occurs on the western portion of the Study Area, as well as Watercourse 6 which generally forms the eastern limit of the Subject Lands. Isolated woodland and wetland features have also been identified in background mapping in association with Watercourse 6, however some of these lands are currently under appeal. Further description and discussion of these features are provided below.

Please note that lands identified as 238 Jones Road continue to be under appeal. Any designations or discussion regarding these lands have been intentionally excluded from this report.

1.2 Proposed Development

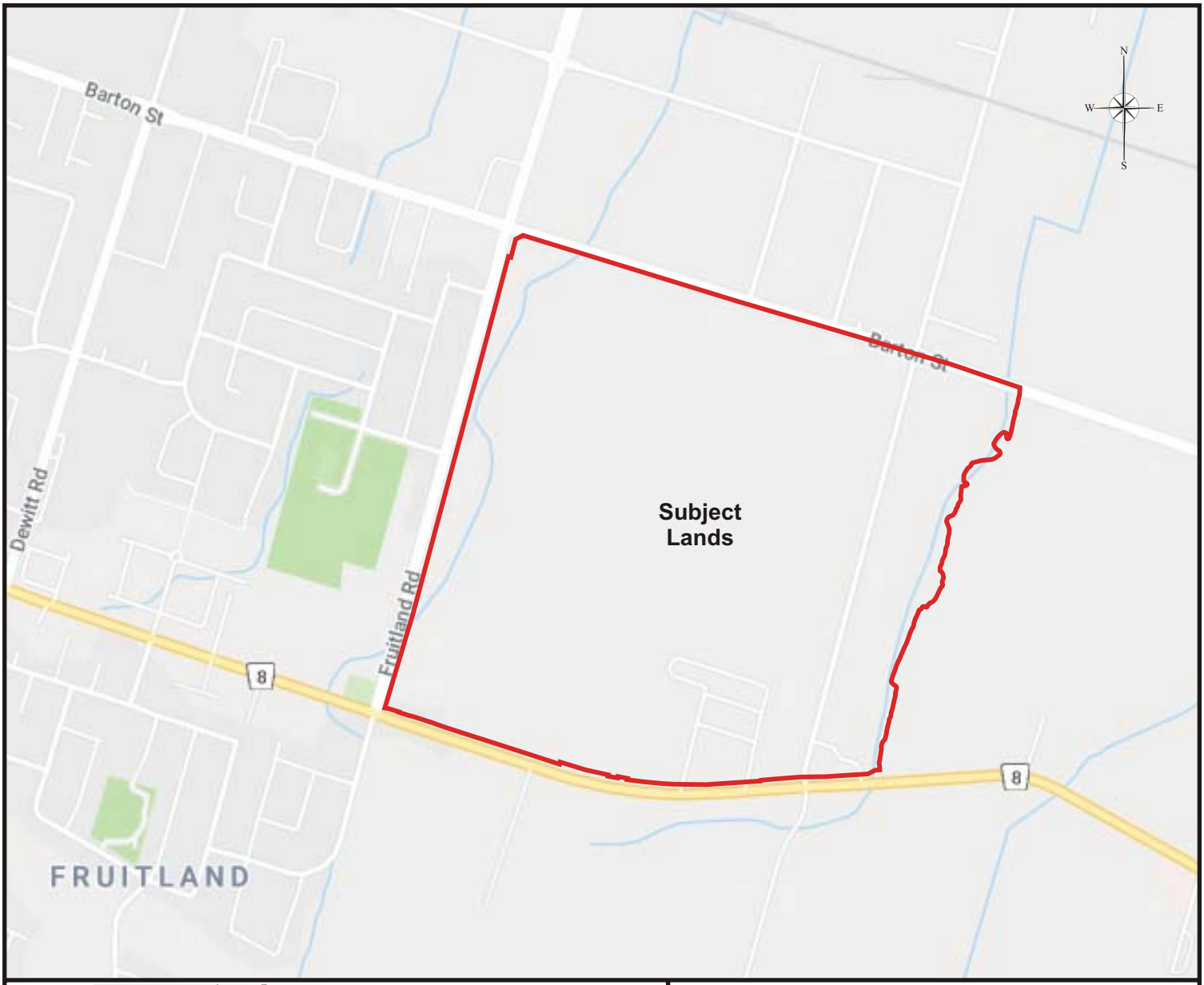
The current Block 1 Development Concept Plan (Urbantech November 2021) for the Block 1 lands includes two arterial roads, a mixture of low to medium density residential zones, as well as commercial and institutional uses, community and neighbourhood parks, stormwater management facilities, utility, and general open space. In addition to the proposed land uses, it is proposed that Watercourse 5 will be relocated to a watercourse block, which will also incorporate the associated floodplain, meander belt and vegetation protection zones.

2.0 STUDY APPROACH

2.1 Background Review

Prior to the commencement of primary field inventories, a review of background material available for the Subject Lands and surrounding area was conducted. Some of the background information reviewed included:

- Urban Hamilton Official Plan (City of Hamilton 2014);
- Fruitland-Winona Secondary Plan (City of Hamilton 2018);
- Ontario Ministry of Natural Resources Hamilton Species at Risk List (MNR 2018);



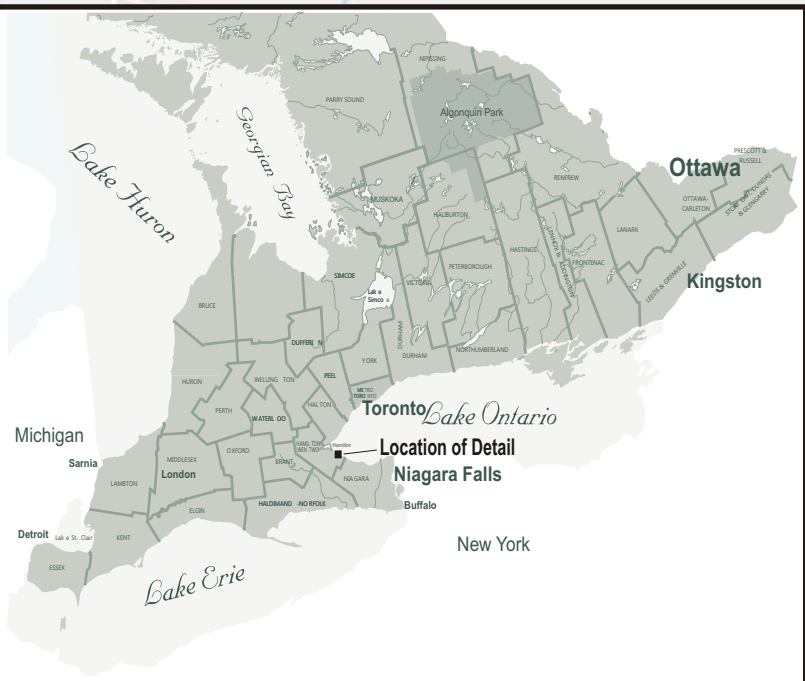


Figure 1
Location of Subject Lands

Environmental Impact Statement
Block 1 Lands, City of Hamilton

Prepared for:

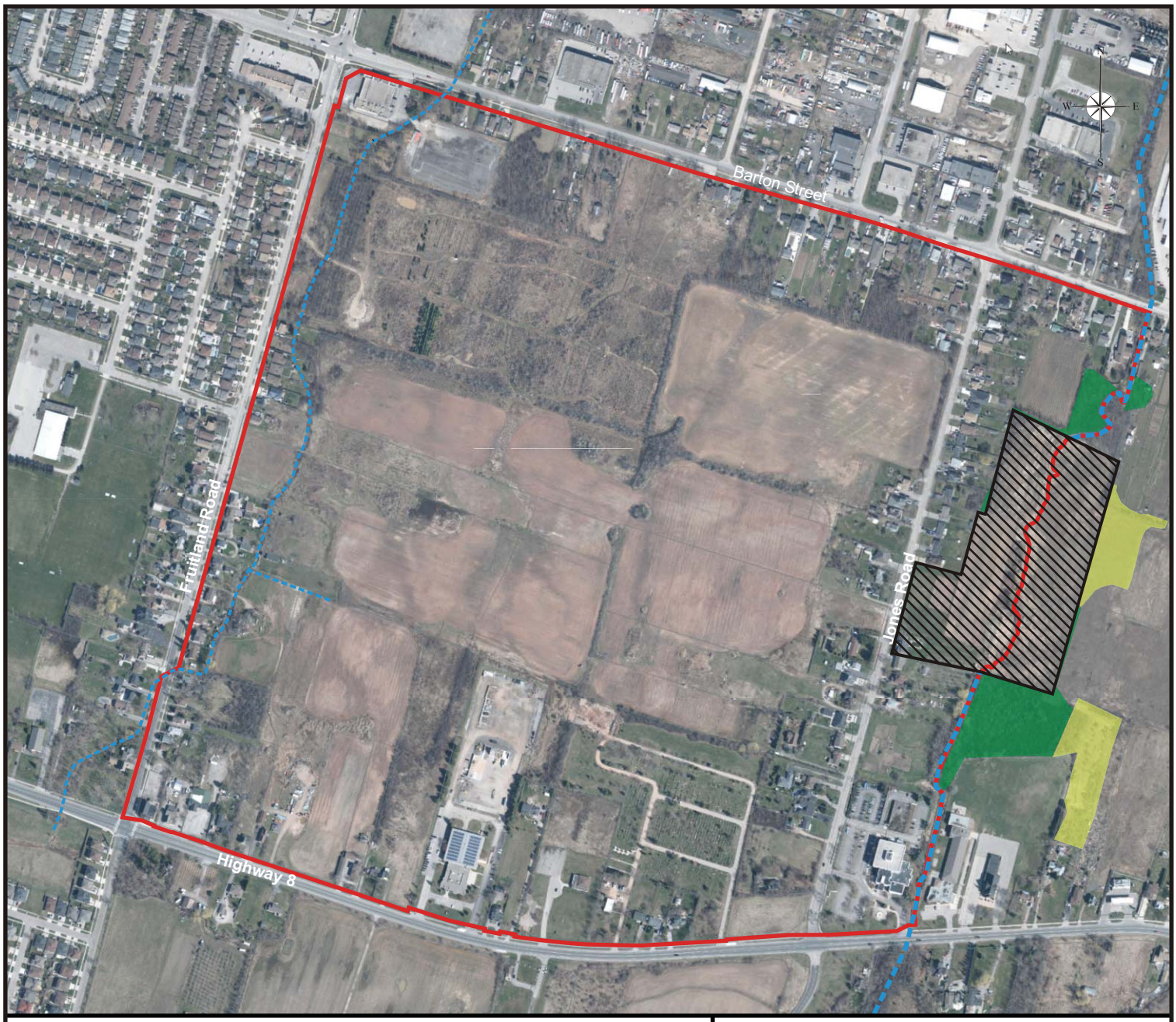
Fruitland-Winona
Block 1 Owners

Prepared by:

COLVILLE CONSULTING INC.

DATE: March 2024

FILE: 18028



Legend

- Subject Lands
- Watercourses
- Linkage
- Core Area (Significant Woodland)
- Lands Under Appeal

Source: Urban Hamilton Official Plan Schedules.
Hamilton Conservation Authority Regulatory Area and Buffer Requirements not shown.
Mapping is Approximate

Figure 2
Mapped Natural Heritage Features on the Subject Lands

Environmental Impact Statement
Block 1 Lands, City of Hamilton

Prepared for: **Fruitland-Winona Block 1 Owners**

Prepared by: COLVILLE CONSULTING INC.

Date: March 2024

FILE: 18028

- Background data available from the HCA (including data from the Hamilton Natural Heritage Database) and Ministry of Natural Resources and Forestry (MNRF);
- Fisheries and Oceans Canada (DFO) Aquatic species at risk map (DFO 2021);
- Hamilton Natural Areas Inventory, 3RD Edition (Schwetz 2014);
- Stoney Creek Urban Boundary Expansion (SCUBE) West Subwatershed Study Phase 1 and Phase 2 Final Report (Aquafor Beech Limited 2013);
- Natural Heritage Assessment of Lands Bounded by Fruitland Road, Glover Road, Barton Street and Highway 8, City of Hamilton (Dillon Consulting Limited 2009);
- Fruitland-Winona Block 1 Servicing Strategy Environmental Assessment & Natural Heritage System Plan (Dougan and Associates 2017) and,
- Aquatic Assessment Report Gordon Dean Avenue - Schedule 'C' Municipal Class Environmental Assessment (Phases 3 & 4) (Wood 2020).

2.2 Field Inventories

In order to ensure all natural heritage features on the properties were assessed adequately, the following inventories and assessments were conducted on the Subject Lands:

1) Breeding bird surveys;
2) Botanical inventories;
3) Assessment and description vegetation communities on the properties using the Ecological Land Classification System for Southern Ontario;
4) Aquatic Habitat Assessment and Electrofishing Survey;
5) Amphibian vocalizations surveys;
6) Assessment of potential bat roosting habitat;
7) Search for Species at Risk habitat on and adjacent the Subject Lands; and,
8) Documentation of wildlife on the Subject Lands.

Table 1: Summary of field visits and assessments.

Date	Observer	Time	Weather Conditions	Purpose
April 15, 2015	Dougan and Associates	08:00 – 12:00	Clear, calm, 15 °C	Reconnaissance Survey
April 29, 2015	Dougan and Associates	08:20 – 12:40	Partly cloudy, light southeast winds, 12 – 20 °C	Wildlife and SAR Survey #1
May 13, 2015	Dougan and Associates	08:45 – 13:00	Partly cloudy, light northwest winds, 10 – 17 °C	Wildlife and SAR Survey #2
May 21, 2015	Dougan and Associates	08:45 – 13:10	Partly cloudy, calm, 11 – 18 °C	Wildlife and SAR Survey #3
June 1, 2015	Dougan and Associates	---	N/A	ELC survey
June 3, 2015	Dougan and Associates	05:50 – 11:45	Clear, calm, 9 – 17 °C	Wildlife and SAR Survey #4 and Breeding Bird Survey #1
June 4, 2015	Dougan and Associates	---	N/A	ELC survey
June 12, 2015	Dougan and Associates	06:30 – 10:30	Cloudy, light southeast winds, 16 – 19 °C	Wildlife and SAR Survey #5 and Breeding Bird Survey #2

Date	Observer	Time	Weather Conditions	Purpose
August 6, 2015	Dougan and Associates	---	N/A	ELC survey and OWES wetland delineation
November 2, 2015	Dougan and Associates	---	N/A	OWES wetland refinement
December 22, 2015	Dougan and Associates	---	N/A	Review of cover changes on Benemar Lands and vicinity: 230 – 242 Fruitland Road, with D. Joyce of S. Woods Engineering
September 8, 2016	Dougan and Associates	---	N/A	Reconnaissance level review of cover changes at 238 Jones Road, 212 Fruitland Road, and 667 Highway 8, with I. Barrett of Colville Consulting
June 4, 2018	Colville Consulting	12:15 – 14:30	partly cloudy, calm, 18°C	Wildlife Survey
June 14, 2018	Colville Consulting	06:00 – 8:30	partly cloudy, light winds, 17°C	Breeding Bird Survey #1
June 15, 2018	Colville Consulting	---	partly cloudy, calm, 24°C	Botanical and ELC survey
June 29, 2018	Colville Consulting	---	partly cloudy, calm, 30°C	Wildlife Survey
July 6, 2018	Colville Consulting	06:30 – 8:45	partly cloudy, calm, 18°C	Breeding Bird Survey #2
July 19, 2018	Colville Consulting	09:15 – 11:30	partly cloudy, calm, 28°C	Wildlife Survey
September 16, 2018	Colville Consulting	14:15 – 16:50	partly cloudy, light winds, 21°C	Wildlife Survey
October 4, 2018	Colville Consulting	13:30 – 16:20	partly cloudy, light winds, 17°C	Wildlife Survey
October 28, 2018	Colville Consulting	---	partly cloudy, light winds, 6°C	Botanical and ELC survey
June 27, 2019	Dougan and Associates	05:45 - 07:45	clear, calm, 21 °C	Breeding Bird Survey #3
September 26, 2019	Dougan and Associates	17:00 – 18:00	Clear, calm	Fall botanical and ELC updates
May 28, 2020	Dougan and Associates	17:00 – 18:00	Clear, calm	Hawthorn identification
April 14, 2021	Dougan and Associates	20:32 – 22:30	partly cloudy, calm, 14 °C	Amphibian Call Survey #1
May 13, 2021	Dougan and Associates	21:05 - 22:09	clear, calm, 17°C	Nocturnal Amphibian Call Survey #2
June 2, 2021	Dougan and Associates	11:00 – 14:00	clear, calm, 20°C	Spring Botanical with focus on Hawthorns (flower collection)
June 9, 2021	Dougan and Associates	07:00 - 08:00	clear, calm, 21°C	Breeding Bird Survey #1

Date	Observer	Time	Weather Conditions	Purpose
June 9, 2021	Dougan and Associates	09:00 – 16:00	clear, calm, 25°C	Spring botanical and ELC Updates
July 1, 2021	Dougan and Associates	05:48 – 06:48	overcast, intermittent drizzle, calm 20°C	Breeding Bird Survey #2
September 30, 2021	Dougan and Associates	14:30 – 15:30	Clear, calm	Hawthorn identification
June 1, 2023	Colville Consulting	---	Mostly sunny, light winds, 18°C	Breeding Bird Survey #1 survey
June 21, 2023	Colville Consulting	---	partly cloudy, light winds, 21°C	Breeding Bird Survey #2 survey
July 4, 2023	Colville Consulting	---	Mostly sunny, light winds, 28°C	Botanical and ELC survey
September 26, 2023	Colville Consulting	---	partly cloudy, calm, 18°C	Botanical and ELC survey

The methods employed for each of the above components are provided in the appropriate sections below.

3.0 STUDY FINDINGS

3.1 Botanical Inventories and Vegetation Mapping

Botanical inventories of the Subject Lands were conducted on June 1, June 4 and August 6, 2015, June 15 and October 28, 2018, September 26, 2019, May 28, 2020, June 2, June 9 and September 30, 2021, July 4 and September 26, 2023. Vegetation communities (ELC units – following Lee et al. 1998) were mapped and described, and a list of botanical species was compiled (see Appendix A). Species status was assessed for Ontario (Oldham and Brinker 2009) and City of Hamilton (Goodban 2014). Representative photos of the vegetation communities on these properties are presented in Appendix B. The results of our observations and assessment are provided below.

3.1.1 Botanical Inventories

Two hundred sixty-seven (267) plant species were documented during various botanical inventories (see Appendix A). No species considered at risk in Ontario were documented on the Subject Lands. Two provincially significant species were observed: Hairy Green Sedge (S3) and Fox Grape (which is considered Imperiled (S1), if naturally occurring). The Fox Grape observed throughout the study area is an agricultural variety, and has established from nearby vineyards.

Several species identified as rare or uncommon in the Hamilton were identified (Goodban 2014). Uncommon species include Necklace Sedge, Pear Hawthorn, Broad-leaved Frosted Hawthorn, Downy Hawthorn and Northern Dewberry. Species that are considered rare in Hamilton include Scarlett Hawthorn.

Hawthorn identifications were verified using both flower and fruit material for most species. Other Hawthorn species likely occur within the study area given their overall abundance and widespread distribution. Frosted Hawthorn, Downy Hawthorn and Scarlet Hawthorn were observed throughout the Study Area and were very abundant within the thickets and hedgerows. Pear Hawthorn was only observed at two locations, but is also likely present elsewhere within the Study Area.

Northern Dewberry was observed at several locations in the meadows and thickets and is likely present throughout the Study Area where these conditions occur. The specific locations, or relevant polygons where each significant species was observed are shown on Figure 3.

3.1.2 Vegetation Communities

The following is a list of vegetation communities were mapped and described on the Subject Lands:

CUM1-1	Dry - Moist Old Field Meadow Type
CUP3	Coniferous Plantation
FODM7-2	Green Ash Hardwood Lowland Deciduous Forest Type
FODM9-6	Fresh Moist Oak-Hardwood Deciduous Forest Type
HR	Hedgerow
MAMM1	Graminoid Mineral Meadow Marsh Ecosite
MEMM3	Dry - Fresh Mixed Meadow Ecosite
OAGM1	Annual Row Crops
SAGM1	Vineyard
THDM3	Dry - Fresh Deciduous Hedgerow Thicket Ecosite
THDM2-6	Buckthorn Deciduous Shrub Thicket Type
WODM4-4	Dry - Fresh Black Walnut Deciduous Woodland Type
WODM-5	Fresh - Moist Deciduous Woodland Ecosite

The extent of these vegetation communities are illustrated in Figure 3. No provincially or locally (City of Hamilton) significant plant communities were present.

The central portion of the Study Area consists primarily of Dry-Fresh Old Field Cultural Meadow Type (CUM1-1), along with areas that are in agricultural production. Vegetation in CUM1-1 communities consisted of mix of grasses, asters, goldenrods and typical meadow species, with scattered Grey Dogwood and Dotted Hawthorn throughout. Although not mapped as separate polygons, small inclusions of Graminoid Mineral Meadow Marsh occur in this community.

Isolated pockets of Dry – Fresh Mixed Meadow Ecosite (MEMM3) were also located on the east and southern portions of the Study Area. These areas were dominated by pioneering and disturbance tolerant grasses and forbs such as Canada Goldenrod, Kentucky Bluegrass and Fuller's Teasel. European Buckthorn and other shrubs such as Multiflora Rose, Staghorn Sumac and were common in these communities.

Located throughout the Study Area are several communities described as open Buckthorn Deciduous Shrub Thicket Type (THDM2-6). These communities have generally formed on lands previously used for agricultural orchard and nursery. Common Buckthorn dominates the shrub layer in these communities, with Grey Dogwood and Rose species also occurring. In open areas, Goldenrod and Aster species dominate the ground layer with field grasses, Wild Carrot, Grass-leaved Goldenrod, Common Strawberry and Ox-eye Daisy. Up to 10% cover in these communities is also formed by young trees or saplings, which mostly consist of Green Ash, Apple and Pear trees.

A Buckthorn Deciduous Shrub Thicket Type (THDM2-6) with complexes of Dry – Fresh Black Walnut Deciduous Woodland Type (WODM4-4) occur in the northwest corner of the Study Area. Tree cover in the open woodland portions of the community consist of open grown Black Walnut, and Green Ash trees, with the ash exhibiting significant canopy die back due to the Emerald Ash Borer infestation. Also common in the open canopy are tall Common Buckthorn. Common Buckthorn shrubs form approximately 60% cover in the sub-canopy layer, with Manitoba Maple Oaks and Staghorn Sumac also occurring. Cover in the shrub layer is greater than 60% and is

dominated by Common Buckthorn. Grey Dogwood, Honeysuckle, Rose species and the occasional Common Privet also occur in the shrub layer. Grasses and herbaceous meadow species fill in the ground layer.

Located within this open thicket is a small Coniferous Plantation (CUP3). This community is remnant from the former nursery operation on the property, with holes still present from where trees were spade from the ground. An even smaller stand of young Trembling Aspen trees occurs just to the east of this plantation, which is also remnant from the former nursery.

Several hedgerows, described as Deciduous Hedgerow Thicket (THDM3) and Buckthorn Deciduous Hedgerow Thicket Type (THDM3-1), are present in the Block 1 Study Area. European Buckthorn is common within most of these hedgerows, forming up to 80% cover in some instances. Additional species within these communities include Trembling Aspen, Eastern Cottonwood, Shagbark Hickory, Bur Oak and Basswood, along with young Green Ash, and Dotted Hawthorn. Several locally significant plants are abundant within the hedgerows, including Northern Dewberry and Hawthorns (see Appendix A).

Located along the northern extent of the Study Area are several small and isolated woodland communities. These woodlands were not studied extensively due to lack of access, however these areas were described on a preliminary basis as Green Ash Hardwood Lowland Deciduous Forest (FODM7-2) and Fresh-Moist Oak-Hardwood Deciduous Forest. (FODM9-6). Canopy cover in these woodland polygons was variable and these communities appear to be less than 80 years of age based on historical air photo review. The southern edge of FODM9-6a and the adjacent open thicket contained locally significant Broad-leaved Frosted Hawthorn and Hairy Green Sedge, as well as a number of other oak woodland associates such as Bastard Toadflax and Deceitful Pussytoes. A small inclusion of Red Maple swamp also appears to occur within FODM9-6a, however this area was not surveyed extensively and too small to map.

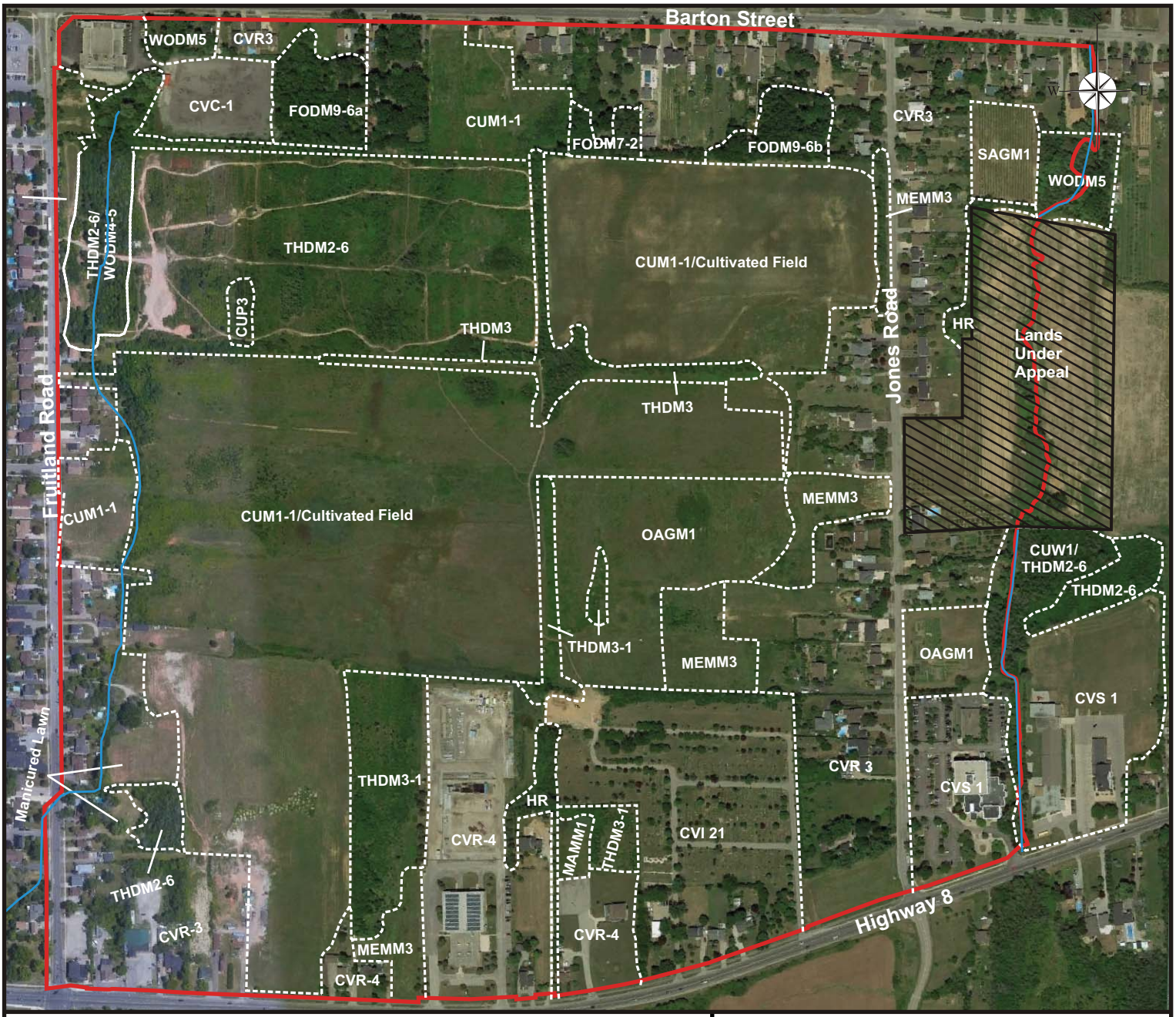
Small and isolated pockets of woodland were also identified in association with Watercourse 6, as well as south of Barton Street. These woodlands were not surveyed extensively, however canopy cover in these woodlands appears to have been significantly impacted by Ash die off associated with Emerald Ash Borer.

Small wetland communities were identified in the Study Area associated with Watercourse 6, as well as north of Highway 8. The community north of Highway 8 was described as Graminoid Mineral Meadow Marsh Ecosite (MAMM1). The southern portion of this community consisted primarily of a mix of sedges, with Common Reed occurring on the northern portion of the community. Two small communities described as Reed-canary Grass Graminoid Mineral Meadow Marsh Type (MAM2-2) were delineated adjacent to Watercourse 6. Reed Canary grass dominates this community, with scattered plants of Water Smartweed and an mixture of old field meadow species.

3.2 Wildlife and Wildlife Habitat

3.2.1 Breeding Bird Surveys

Breeding bird surveys within the Subject Lands were conducted on June 3 and June 12, 2015, June 14 and July 6, 2018, June 27, 2019, June 9 and July 21, 2021 and June 1 and June 21, 2023. Surveys were conducted following the protocols outlined by the Ontario Breeding Bird Atlas (OBBA 2001). Surveys were completed at least 15 days apart, under suitable weather conditions with little to no wind or precipitation. A thorough search of the Subject Lands was completed during surveys between dawn and no later than 10:00 am. All birds seen or heard calling were recorded and the



Legend

	Subject Lands
THDM2-6	Buckthorn Deciduous Shrub Thicket Type
THDM3-1	Buckthorn Deciduous Hedgerow Thicket Type
FODM9-6	Fresh Moist Oak-Hardwood Deciduous Forest Type
FODM7-2	Green Ash Hardwood Lowland Deciduous Forest Type
WODM-5	Fresh - Moist Deciduous Woodland Ecosite
WODM4-4	Dry - Fresh Black Walnut Deciduous Woodland Type
CUW1	Cultural Woodland Ecosite
MAMM1	Graminoid Mineral Meadow Marsh Ecosite
MAMM2-2	Reed-canary Grass Mineral Meadow Marsh Type
CUM1-1	Dry - Moist Old Field Meadow Type
MEMM3	Dry - Fresh Mixed Meadow Ecosite
CVR/CVI	Residential, Rural, Commercial, Educational Lots
OAGM1	Annual Row Crops
CUP3	Coniferous Plantation
SAGM1	Vineyard
HR	Hedgerow

*ELC Information and mapping generated from Colville Consulting Inc Natural Characterization Assessment (2019), Dougan & Associates EIS (Draft 2021) and observations in 2023.

Figure 3
Vegetation Communities on the Subject Lands

Environmental Impact Statement
Block 1 Lands, City of Hamilton

Prepared for: **Fruitland-Winona Block 1 Owners**

Prepared by: COLVILLE CONSULTING INC.

Date: March 2024

File: C18028

highest breeding evidence per species was determined in accordance with the criteria of the Atlas of the Breeding Birds of Ontario (Cadman et al. 2007).

A total of 65 species of birds were detected during the breeding bird surveys and other wildlife surveys (see Appendix C). Sixteen of these species were considered as possibly breeding on the site. Nine species were observed incidentally during flyovers and were considered non-breeding. Of the 60 species of birds observed, four species (Rock Pigeon, European Starling, House Finch, and House Sparrow) are considered introduced (non-native). Of the remaining 48 species (excluding non-native and non-breeding species), six are considered Species at Risk (Barn Swallow (detected in 2015 and 2018), Bobolink (detected in 2015 and 2018), Chimney Swift, Eastern Meadowlark (detected in 2015 only), Grasshopper Sparrow (detected in 2018 only) and Eastern-wood Pewee (detected only during the June 9, 2021 visit).

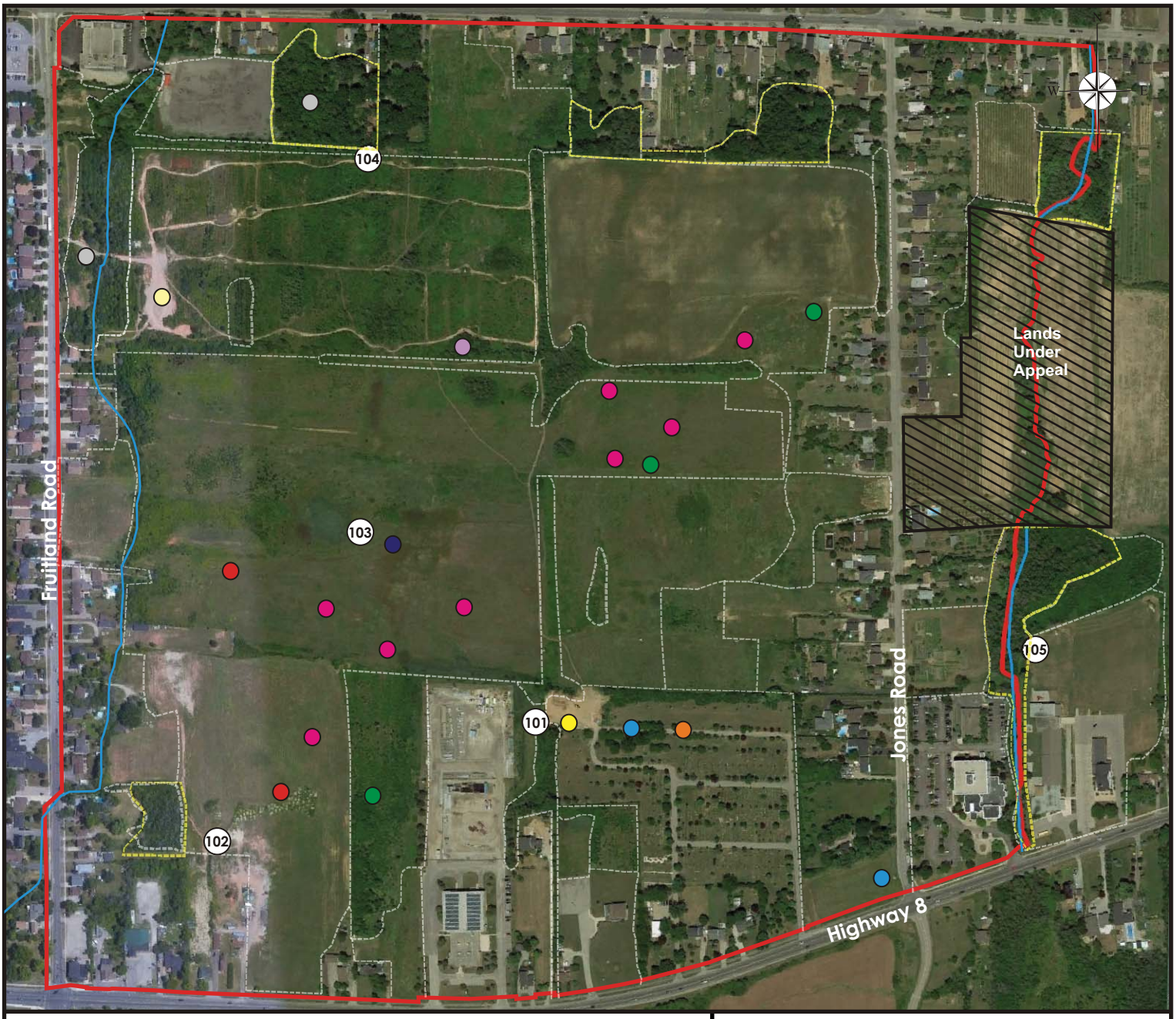
Barn Swallow, Eastern-wood Pewee and Grasshopper Sparrow are designated as Special Concern provincially and federally. Bobolink, Chimney Swift and, Eastern Meadowlark are designated as Threatened provincially and federally.

At a provincial level, all of the 48 native breeding species (excluding flyovers, non-native species and migrants) have been assigned an Srank of either S4 or S5 by the Natural Heritage Information Centre (NHIC 2017b), which indicates that their provincial populations are "apparently secure" or "secure", respectively (NHIC 2017a).

At a regional level, 19 species – American Woodcock, Baltimore Oriole, Barn Swallow, Bobolink, Brown Thrasher, Canada Goose, Eastern Meadowlark, Eastern Kingbird, Eastern Wood-pewee, Field Sparrow, Grasshopper Sparrow, Great Blue-heron, Green Heron, Killdeer, Northern Flicker, Northern Roughwinged Swallow, Savannah Sparrow, Vesper Sparrow and Wilson's Snipe – have been designated by Partners in Flight as priority species in BCR 13 (Lower Great Lakes/St. Lawrence plain) (Environment Canada 2014); BCR 13, the Lower Great Lakes – St. Lawrence Plain, corresponds roughly with the area south of the Canadian Shield. The Ontario Landbird Conservation Plan, from which the list of priority landbird species was obtained, is a coalition of government agencies and organizations led by Environment Canada Ontario Region (EC) and the Ontario Ministry of Natural Resources and Forestry (OMNRF), in partnership with Bird Studies Canada (BSC).

At a local level, 42 of the 48 potentially native breeding species are considered common to abundant and widespread in the City of Hamilton (Smith 2014). The eight (8) exceptions, with their status in brackets, are as follows: Brown Thrasher (uncommon), Eastern Meadowlark (uncommon), Grasshopper Sparrow (rare) Green Heron (uncommon), Northern Mockingbird (uncommon), Red-bellied Woodpecker (uncommon), Vesper Sparrow (uncommon) and Wilson's Snipe (rare). Chimney Swift (uncommon), Great-blue Heron (uncommon) Turkey Vulture (uncommon) and Winter Wren (uncommon) are also considered locally rare but where not considered as breeding in the study area.

The highest level of breeding evidence obtained during the surveys was "confirmed" breeding (OBBA 2001); this evidence was obtained for seven (7) species, either by the presence of fledged young or agitated behavior by adult birds: American Robin, Baltimore Oriole, Common Grackle, European Starling (non-native), Red-winged Blackbird, Savannah Sparrow, and Song Sparrow. The next highest level of breeding evidence was "probable" breeding (OBBA 2001), either by the observation of pairs of birds (code P) or territorial males (code T), which is defined as a singing male being present at the same location at least seven days apart. This evidence was the highest



Legend

Subject Lands

Wildife

101 Amphibian Monitoring Station

Potential Bat Maternity Roost Habitat

- Barn Swallow
- Brown Thrasher
- Bobolink
- Chimney Swift
- Eastern Meadowlark
- Eastern Wood-pewee
- Red-bellied Woodpecker
- Wilson's Snipe
- Vesper Sparrow

Vegetation

- Rubus flagellaris

*Wildlife and vegetation information obtained from Colville Consulting Inc Natural Characterization Assessment (2019) and Dougan & Associates EIS (Draft 2021) field inventories.

Figure 4
Locations of Significant Wildlife Observations on the Subject Lands

Environmental Impact Statement
Block 1 Lands, City of Hamilton

Prepared for: **Fruitland-Winona Block 1 Owners**

Prepared by: COLVILLE CONSULTING INC.

Date: March 2024

File: C18028

breeding level obtained for 28 species (including two non-native species). The next highest level of breeding evidence was "possible" breeding (OBBA 2001), as seen with singing males (code S) or birds being present in appropriate breeding habitat during the breeding season (code H). This evidence was the highest breeding level for 16 species, with those detected as either singing (S), or being present in suitable habitat (H), but not singing or displaying territoriality.

3.2.3 Amphibian Vocalization Surveys

Amphibian vocalization surveys were conducted on April 14 and May 13, 2021 to assess amphibian use of wetlands and areas of seasonal standing water in the Study Area. The locations of survey stations are illustrated in Figure 4. Call surveys for each survey area were conducted within the timing periods specified under the Marsh Monitoring Program protocols (BSC 2009). Wetland areas were generally dry at the time of the second vocalization survey, resulting in no calling from the study area. A third survey was not completed due to lack of suitable amphibian breeding habitat. The results of surveys are provided in Table 2 below.

Table 2: Results of amphibian call surveys

		Western Chorus Frog	American Toad	Northern Leopard Frog
Station 101	April 14, 2021	1-3	1-2	1-2
	May, 13, 2021	-	-	-
Station 102	April 14, 2021	-	-	-
	May, 13, 2021	-	-	-
Station 103	April 14, 2021	2-10	2-4	2-5
	May, 13, 2021	-	-	-
Station 104	April 14, 2021	2-5	1-3	1-1
	May, 13, 2021	-	-	-
Station 105	April 14, 2021	2-10	1-1	-
	May, 13, 2021	-	-	-

*Numbers in cells represent (calling code – estimated numbers).

3.2.4 Wildlife Observations

During the summer, the Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis and Tri-coloured Bats are found in a variety of forested habitats, as well as abandoned buildings, barns and attics. In forested habitats, cavities in trees, loose bark, foliage and other cover objects are used for roosting. These species forage in a variety of habitats where flying insects and spiders are present, often in association with wetlands, ponds and streams. Overwintering typically occurs in caves.

An assessment of potential bat roosting habitat was conducted on April 20, 2022 using methods described in MNRF (2017). From our observations, potential maternal roost habitat is provided by scattered dead Green Ash trees that were exhibiting loose bark. These potential trees were located in various vegetation communities within the Study Area. Loose bark on Shagbark Hickory trees was also documented in the FODM9-6 and FODM7-2 communities. The FODM9-6 communities also contained scattered Oak trees, which could provide potential roosting habitat.

Due to the nature of this project, no acoustic monitoring was conducted as part of this assessment, however since bat roosting habitat can be dynamic, it is recommended that further assessments of potential bat habitat be conducted as part of a site-specific EIS.

3.2.5 Wildlife Observations

Incidental wildlife observations including signs were recorded during each visit to the Study Area. Observations include Eastern Cottontail, Grey Squirrel and Northern Short-tailed Shrew, along with track evidence of White-tailed Deer, coyote and raccoon. Green Frogs were also observed in the watercourse.

Observations of insects were also documented during field assessments and included

- American Dog Tick (*Dermacentor variabilus*)
- Black Swallowtail (*Papilio polyxenes*)
- Bumble Bee (*Bombus* spp)
- Cabbage White Butterfly (*Pieris rapae*)
- Cicada (Cicadidae)
- Clouded Sulphur (*Colias philodice*)
- Cricket (Gryllidae)

Active hand searches of vegetation and debris were also completed during visits to the property to assess potential use by wildlife species. DeKay's Brownsnake and Eastern Gartersnake were observed during these surveys.

3.3 Aquatic Habitat Assessment

The following contains an assessment of aquatic habitat within the Block 1 Study Area. Although Watercourses 5 and 6 are located in the Study Area, this assessment focuses primarily on Watercourse 5, as this watercourse is located entirely within the Block 1 study area and represents a significant natural feature within these lands. Since Watercourse 6 is located on the peripheries of the Study Area and limited access was available for this project, it is anticipated that Watercourse 6 may be further studied as part of the assessment of Block 2 lands.

3.3.1 Review of Background Information

Aerial imagery and background information identify Watercourses 5 and 6 as first order streams. Watercourse 5, largely originates south of Highway 8 and west of Fruitland Road, within the Stoney Creek Numbered Watercourses Subwatershed (HCA, 2021). Much of the subwatershed area to the south of Highway 8 has been altered under residential subdivision. A stormwater outlet southwest of Highway 8 releases into a drainage swale which may contribute flow to the watercourse periodically. Watercourse 5 continues to drain generally north to Lake Ontario, crossing Fruitland Road through a concrete box culvert in a northeastern direction about 210 m north of Highway 8.

Similar to Watercourse 5, Watercourse 6 originates south of Highway 8 and conveys surface water from the Niagara Escarpment north to Lake Ontario. This watercourse south of Highway 8 appears to have been highly altered though previous agricultural and drainage works, and has been historically modified within the Study Area.

3.3.1.1. Online Databases

No fish records were available for Watercourses 5 or 6 within the online databases reviewed; however, LIO Aquatic Resource Area (ARA) Survey point data (2021) identified a location on Watercourse 5, south of the QEW as having a warm-water thermal regime.

A review of DFO aquatic Species at Risk (2021) mapping did not identify any records of aquatic SAR or Species of Conservation Concern (SOCC) as potentially occurring within the Study Area.

3.3.1.2. Aquatic Resource Reference Documents

Watercourse 5 & 6 Class Environmental Assessment Study Draft Report; Prepared for the City of Hamilton (Dillon 2007)

Watercourse 5 was identified as indirect fish habitat based on field surveys (just south of Barton Street to Lake Ontario) and consultation with Hamilton Conservation Authority (Dillon 2007). The watercourse outlet to Lake Ontario was concluded to inhibit fish movement given the perched nature of the culvert at that location, along with notably shallow water observed in portions of the channel, and other potential fish barriers to movement. The DFO and MNR identified Watercourse 5 as direct fish habitat: however, communication with MNR identified that no fisheries information existed (Dillon 2007), and as such remains unclear as to the basis for this conclusion.

Natural Heritage Assessment of Lands Bounded by Fruitland Road, Glover Road, Barton Street and Highway 8 (Dillon 2010)

The reach of Watercourse 5 between Highway 8 and Barton Street is identified as having permanent flow based on surveys conducted in May 2009. An electrofishing survey was also completed in May 2009, within three sections of the watercourse between Highway 8 and Fruitland Road, and did not record any fish. This report identified the watercourse within the Study Area as indirect fish habitat due to the lack of fish observations, constraints to fish movement, the lack of refuge pools and the distance to the lake.

Stoney Creek Urban Boundary Expansion (SCUBE) West Subwatershed Study Phase 1 AND Phase 2 Final Report (Aquafor Beech 2013)

Under this study, Watercourse 5 was investigated through background review and field investigations and was determined to be indirect fish habitat (Aquafor Beech 2013). The report conclusions suggested the potential for permanent direct fish habitat downstream of Barton Street through restoration work.

Aquatic Assessment Report Gordon Dean Avenue -Schedule 'C' Municipal Class Environmental Assessment (Phases 3 & 4) (WOOD 2020)

Wood (2020) undertook an aquatic field investigation in support of the Gordon Dean Avenue Class EA, specifically assessing the conditions associated with the Watercourse 5 crossing by Collector Road B. The habitat assessment included a detailed assessment 50 m downstream to 20 m upstream of the proposed crossing location, with a general assessment performed for the additional 150 m downstream and 30 m upstream of the proposed crossing location. The defined channel, visible high-water mark along the banks and lack of terrestrial vegetation within the channel suggest that Watercourse 5 within the aquatic Study Area is a permanent watercourse, although areas of low flow during drier periods (e.g. summer) are anticipated to impede fish passage. No fish were observed or collected during the Wood 2020 fish community survey, suggesting Watercourse 5 provides indirect fish habitat.

3.3.2 Aquatic Resource Findings

The following sections provide descriptions of the biophysical conditions as observed in various reaches of Watercourse 5, both within the Subject Lands, as well as upstream and downstream areas. The downstream areas were included to provide context in relation to watercourse habitat conditions between the proposed development area and Lake Ontario to the north relative to assessing potential impacts, and to assess the opportunities for or impediments to meaningful mitigation and enhancement of habitat and aquatic linkage functions in future planning. In order to facilitate the descriptions below with representative locations in the watercourse, Figures W-1, W-2 are provided in Appendix D. The areas surveyed have also been photo-documented in Appendix D.

3.3.2.1 Highway 8 Crossing

Within this assessed area, the Watercourse 5 channel runs in a north/south direction, perpendicular to Highway 8. Trees are present along the channel upstream and downstream of Highway 8 providing >80% cover. Water levels observed during field investigations are a potential barrier to fish movement.

Upstream of the Culvert

A 5 m length of the channel was visible upstream of Highway 8. At the upstream extent of the surveyed area, a 2 m high gabion basket wall is present across the channel, with three approximately 15 m long corrugated steel pipe (CSP) culverts conveying drainage originating from a stormwater management dry pond. A 0.8 m diameter CSP is at the same elevation as the channel bed with two 1.1 m diameter CSP culverts approximately 0.5 m above the channel bed (Appendix D Photo 1). Within this section, the wetted width of the channel was 0.3 to 0.8 m and water depth generally ranged from 0.1 to 0.5 cm during the various site visits with a maximum depth of 9 cm observed during the June survey (Appendix D Photo 2). The 2.2 m wide channel is fully armoured with gabion baskets forming the banks on both sides which connect to the cross-channel gabion wall 5 m upstream. A 1 m high gabion basket bank toe treatment provides stability and supports a second tier of gabion baskets (~1 m high) for the entire 5 m length of this culvert inlet channel. The channel substrate was predominantly placed flat rock and cobble (gabion stone) with minor clay and gravel present. Manicured grass is present outside of the approximately 30 m wide treed area surrounding the culvert inlet and this maintained meadow continues upstream outside of the drainage feature. Residential properties are located beyond the manicured grassed area and are located approximately 35 m east, 105 m west and 100 m south of the inlet channel area. No channel morphology was observed as there was no observable flow during the surveys.

Within the Culvert

The water within the approximately 1.8 m wide box culvert was observed from both ends of the culvert. The observed wetted width of 1.5 to 2.0 m and depth of 0.3 to 3.0 cm (Appendix D Photo 3) are dependent on the distribution of substrates on the culvert floor. Some cobble and gravel were present within the culvert, with a large area being characterized by exposed concrete culvert floor.

Downstream of the Culvert

The culvert outlet channel was predominantly characterized by cobble substrates, with shallow water depths. The wetted width ranged from approximately 0.25 to 2 m and water depths ranged from 0.3 to 3.0 cm within the first 10 m downstream of the culvert (Appendix D Photos 4, 5). Cobble dominated the substrate, with gravel and silt also present. Dense riparian vegetation blocked visual

assessment of the creek downstream of Highway 8 into the private property area. The reach of watercourse between Highway 8 and Fruitland Road, is characterized by shrubs and large trees that line the channel and provide considerable shading of the channel. Evidence of property maintenance included a mature felled tree that was left laying largely longitudinally in the channel, thereby representing large woody debris as a component of the aquatic habitat (Appendix D Photo 4). The trees that are present along both sides of the channel lightly separate the watercourse from a maintained cemetery immediately to the east and a maintained deep residential property to the west. No channel morphology was observed as there was no observable flow during the surveys.

3.3.2.2 Fruitland Road Crossing

Watercourse 5 continues north in a relative natural state angling to the northeast until it approaches Fruitland Road. The watercourse then appears to have been channelized for approximately 75 m to follow the Fruitland Road alignment as a component of the west lateral ditch system. Within this reach the watercourse passes under two residential driveways through twin CSP culverts that total approximately 20 m of piped channel. The lateral ditch areas are largely manicured lawn with the exception of a small, approximately 10 m reach where the channel and has been permitted to naturalize with dense vegetation (which may only represent a temporary condition pending landowner maintenance) (Appendix D Photo 6). The dense vegetation is dominated by cattail which would potentially provide a barrier to fish movement. At the end of this 75 m reach, the watercourse enters a concrete box culvert, oriented to the northeast, that passes under Fruitland Road. Water levels observed during field investigations are a potential barrier to fish movement.

Upstream of the Fruitland Road Culvert

The culvert inlet channel runs parallel to Fruitland Road, as a roadside ditch in front of residential properties (Appendix D Photo 7). Manicured lawn is present along both sides of the 0.2 to 0.5 m wide channel, with gabion basket culvert inlet protection on the right bank immediately upstream of the concrete box culvert crossing Fruitland Road along with a small CSP that presumably discharges storm water into the channel. The water depths were observed to be very shallow and ranged from 0.04 to 1.0 cm. Minimal channel habitat or riparian habitat is available in this reach due to the intense lawn maintenance. The culvert inlet is at a slight angle to the road, as the culvert crosses the road in a northeast direction. No channel morphology was observed as there was no observable flow during the surveys.

Within the Fruitland Road Culvert

Shallow water, approximately 0.1 to 1.0 cm deep was observed at the inlet and outlet of the approximately 3.3 m wide and 32 m long concrete box culvert. No observable flow was present during the surveys.

Downstream of the Fruitland Road Culvert

Water approximately 0.1 to 0.4 m wide and 0.1 to 1.0 cm in depth was observed immediately downstream of the culvert, with substrates consisting of silt and mud. The general width of the culvert outlet channel itself was approximately 3.0 m (Appendix D Photo 8). During the June 2021 field survey, the channel was dry immediately downstream of the culvert, for approximately 1 m. Additionally, shallow water appeared to be present approximately 6 m downstream of the culvert; however, vegetation limited visual assessment. The watercourse flows east, perpendicular to Fruitland Road, with residential land use on either side of the channel. The watercourse is bordered by a narrow dense, treed riparian area which appear to continue for some 200 m downstream passing through residential back yards. At the road crossing where observations were taken, the

canopy cover was quite dense providing >80% riparian cover and shading of the watercourse channel. No channel morphology was observed as there was no observable flow during the surveys.

3.3.2.3 Fruitland Road to Barton Street Accessible Lands

Due to the approximately 900 m length of the watercourse between Fruitland Road Crossing and Barton Street, Watercourse 5 has been separated into sections to describe the aquatic conditions. The channel is generally orientated in a north/south direction, with slight meandering present and runs parallel to Fruitland Road which is located 40 to 85 m west of the channel. The channel is bordered by woody and herbaceous vegetation within the surveyed reaches. Residential properties with manicured lawns and fallow agricultural lands are present between the channel and Fruitland Road. East of the channel, fallow agricultural land, scrubland and wooded areas are present. Significant anthropogenic influences including walkways, paths, and roads over the tributary are present, along with the surrounding alterations to the landscape. Sections of the watercourse not accessible due to permission to enter were bordered by maintained lawn with the riparian buffer removed. Please see Figure W-2 in Appendix D identifying the reaches described below as well as locations of the crossings.

Residential Driveway Crossing

Shallow water and a dry section of the channel was recorded in June and July which would impede fish movement. Additionally, rock and woody debris at the upstream end of the culvert, and shallow water in the culvert could impede fish movement (Appendix D Photo 12). The watercourse was bordered by a narrow strip of trees and shrubs along the east bank, with mowed lawn beyond. The west bank upstream of the driveway was bordered by grass with woody vegetation also present. The residential property west of the channel was densely treed. Downstream of the driveway, an approximately 8 m wide treed riparian area is present along the west bank, with mowed lawn outside of this up to Fruitland Road. No channel morphology was observed as there was no observable flow during the surveys.

Upstream of the Culvert

Shallow water, 0.1 to 0.2 cm deep, was recorded within the approximately 1.5 m wide channel upstream of the culvert (Appendix D Photo 9). A small, isolated pool, 20 cm deep, 0.3 m long and 0.2 m wide was recorded during the 5 July 2021 field visit (Appendix D Photo 10).

Within the Culvert

Water 0.1 cm deep was recorded within the approximately 3.5 m long culvert during the 17 June 2021 field survey (Appendix D Photo 11). Cobble and woody debris at the upstream end of the culvert could impede fish passage (Appendix D Photo 12).

Downstream of the Culvert

Dense vegetation limited visibility downstream of the culvert, though water could be observed (Appendix D Photo 13).

3.3.2.4 Watercourse Reach WC5-A

A large pool (4 m wide, 5 m long) was present at the upstream end of this section, with a maximum depth of 0.45 m (Appendix D Photo 14). A fallen pedestrian bridge is within the channel and could impede fish passage (Appendix D Photo 15). This section had little to no observable flow during the surveys. The mean wetted width was 1.5 to 2.0 m and the mean water depth was 10 cm, deepening to 30 cm in pools, which occupied approximately 40% of the section. Shallow areas of

water, <0.2 cm were present, along with dry sections, during surveys, which could impede fish movement (Appendix D Photos 16, 17). The substrate within this section was comprised of clay, silt, gravel and muck, with some cobble present. Scour and undercut banks were also present within this stretch (Appendix D Photo 18). The mean bankfull width and depth were 3.0 m and 1.5 m, respectively. The channel is bordered on both sides with deciduous trees, providing an overall riparian cover >70%. Fallow agricultural land is present between the channel and Fruitland, approximately 80 m to the east. The landscape west of the channel is undeveloped and comprised of trees, shrubs and herbaceous vegetation. At the downstream of this section a metal culvert, with a 1.3 m diameter and 4.5 m length is present, with a grass path overtop.

3.3.2.5 Watercourse Reach WC5-B

Water 0.1 cm deep was within the 1.3 m diameter steel culvert at the upstream end of this section (Appendix D Photo 19). Woody debris was present just downstream of the culvert, which could impede fish passage (Appendix D Photo 20). Flat (70%) and pool (30%) morphology dominated the watercourse, with little to no observable flow. Flat morphology consisted of areas with shallower water, while pools were identified as areas with deeper water. The mean water depth within flats was 8 cm while the mean pool wetted width and depth were 60 cm and 19 cm, respectively. Shallow areas of water, <0.2 cm were present, along with dry sections, during surveys, which could impede fish movement (Appendix D Photos 21 to 25). Mean bankfull width and depth were 1.5 m and 3 m, respectively. Substrate was comprised of clay and gravel, with silt and cobble also present. Erosion is present on both banks, with trees, shrubs and herbaceous vegetation bordering the channel on both sides. Residential properties with mowed lawn and fallowed agricultural fields are located to the west and thicket to the east. The riparian vegetation provides >80% cover.

A Wood survey conducted in March 2020 identified riffle and run morphology accounting for 15% of the morphology within the most upstream 50 m of this section (Wood 2020). Increased water depth (2 to 4 cm) and water flow were present during this survey compared to 2021 field surveys. Debris at the culvert outlet, potentially impeding fish passage, was also observed during the March 2020 field survey (Wood 2020).

3.3.2.6 Watercourse Reach WC5-C

This small section of the channel (~13 m length) runs through a narrow woodlot with residential properties upstream and downstream. A large pool was at the upstream end, with a maximum recorded wetted width and depth of 2 m and 34 cm, respectively, accounting for approximately 75% of the section (Appendix D Photos 26, 27). A fallen tree has uplifted the roots, creating a large undercut on the left bank at this pool. The water level decreased along with the channel width moving downstream, with a wetted width and depth of 0.2 m and 0.1 cm at the downstream end. The shallow water observed at the downstream end could impede fish movement. No measurable flow was observed during field investigations. The channel is densely vegetated with deciduous trees and shrubs on both sides, though some exposed soil is present on the banks, with tree roots (Appendix D Photo 28). The channel is bordered by mowed lawn immediately outside of this section (Appendix D Photo 29)

3.3.2.7 Watercourse Reach WC5-D

Little to no observable flow was present during field surveys, with a mean wetted width and depth of 2.3 m and 20 cm. Pools with deeper water, (30 cm), accounted for approximately 5% of this section. Areas of shallow water (< 0.3 cm) and dry areas were present which could impede fish

passage (Appendix D Photos 30, 31). Mean bankfull width and depth were 4.0 m and 1.6 m, respectively. Substrate consisted of muck with silt, gravel and minor cobble. Some erosion and undercutting were recorded along the banks, which are bordered by trees and shrubs providing > 80% riparian cover. Large woody debris was present within the channel. An approximately 6 m span and 3.5 m long wooden bridge is located at the downstream end of this section, with a dirt path over top. A large, ~40 m wide woodlot is present east of the channel for the length of this section. The treed riparian area is approximately 10 m wide along the west side of the channel with fallow agricultural land and trees between this and Fruitland Road, approximately 45 m to the west.

A potential barrier to fish passage occurred above a pool, due to a 45 to 55 cm vertical increase in elevation above the water level (Appendix D Photo 33). Dry channel was present immediately upstream of this elevation change, with pools isolated or joined by shallow (0.1 cm) water upstream. Another potential barrier to fish passage was located just upstream of an access path across Watercourse 5 at the downstream extent of this section (Appendix D Photos 36 to 38). At this location, a 20 cm difference in ground elevation occurs over a 2 m length, with 0 to 0.1 cm water depth recorded over this incline. At the top of this incline, tree roots protrude 28 cm above the channel bed, across the entire width of the channel. A small pool, ~30 cm deep was present at the top of the incline, on the downstream side of the tree root barrier. The combination of the increase in ground elevation over an area with low to no flow and bedrock substrate, and the protruding tree roots at the top of this elevation increase, could impede fish passage. These potential barriers were also recorded during the 2020 field investigations (Wood 2020).

3.3.2.8 Watercourse Reach WC5-E

Little to no flow was observable during field surveys, with areas of shallower (flat) and deeper (pool) water noted within the channel. The watercourse recorded a mean wetted width and depth of 1.3 m (flat) and 2.1 m (pool) and 10 cm (flat) and 20 cm (pool), respectively (Appendix D Photos 40 to 45). Areas of shallow water (< 0.3 cm) and dry areas were also present which would impede fish passage (Appendix D Photo 41). Mean bankfull width and depth were 4.0 m and 1.6 m, respectively. The substrate was comprised of muck with silt, gravel and minor cobble. Some erosion and undercutting were recorded along the banks, which are bordered by trees and shrubs providing > 80% riparian cover. Treed vegetation dominates the landscape for an approximately 40 m width on both sides of the channel. Large woody debris was present within the channel.

3.3.2.9 Barton Street Crossing

The channel runs in a north/south direction, perpendicular to Barton Street. No channel morphology was observed as there was no observable flow during the surveys. Dry portions of channel and shallow water observed during field investigations could impede fish movement. Riparian vegetation borders the channel upstream and downstream of the crossing, providing >80% riparian cover.

Upstream of the Culvert

Shallow water 0.1 to 0.4 cm deep was present a few metres upstream of the culvert, deepening to a maximum depth of 2 cm (June 2021 survey) immediately upstream of the culvert (Appendix D Photos 46, 47). The 1.4 m wide channel had a narrow section of water within it which had a wetted width ranging from 0.2 to 0.8 m during surveys. Gravel was the dominant substrate, with some cobble, sand and silt present. Vegetation was present along the 1.2 m high left bank and 1.8 m high

right bank. Residential property is located east of the channel with a commercial development to the west.

Within the Culvert

The culvert is a combination of a 2 m diameter, 1.4 m long CSP joined with a 1.8 m span, 23.5 m long (approximately) non-rigid frame concrete culvert. A shallow isolated pool of water was present within the culvert during all field visits, with a maximum depth of 19 cm (Appendix D Photo 48). This isolated pocket of water comprised approximately 10% of the area within the culvert. Gravel and cobble were the dominant substrates, with silt and muck present.

Downstream of the Culvert

Dry sections of channel were visible during each field visit, with an isolated shallow pool of water (Appendix D Photos 49 to 52). Maximum water depth ranged from 10 to 20 cm and wetted width ranged from 0.3 to 2 m. The shallow pool ranged from 5 to 10 m in length. Substrate was comprised of gravel, cobble, silt and muck. Large cobble is present along the channel bed at the left bank. Undercutting was observed along the banks which are partially bare. The left bank is 1.7 m high while the right bank is >2 m high. A residential property is located east of the channel with a commercial development to the west.

3.3.2.10 Arvin Avenue Crossing

The channel runs in a north/south direction, perpendicular to Arvin Avenue, with a narrow, densely vegetation riparian area dominated by trees and shrubs. Commercial development surrounds the channel. No channel morphology was observed as there was no observable flow during the surveys. Water levels observed during field investigations are a potential barrier to fish movement.

Upstream of the Culvert

The channel is approximately 3 m wide with dense herbaceous vegetation growing in ¾ of the channel width during all field visits (Appendix D Photo 53). A narrow section of the channel did not have vegetation growing, indicating water is present at least part of the year, potentially during periods of high flow or precipitation events. Water was observed during the 5 July 2021 field survey only, with a section of standing water, 0.4 m wide and 1 to 4 cm deep. A stormwater outlet is located on the east side of the channel, 4 m upstream of the culvert. The narrow, treed area is not present within the initial 9 m length upstream of the culvert. Tall grasses are present at the top of the 1.9 m high banks, with manicured lawn on both sides, providing 60% cover.

Within the Culvert

The channel was dry during the 17 June and 15 July 2021 field investigations with two shallow isolated pools observed during the 5 July 2021 survey (Appendix D Photo 54). The box culvert has a 4.3 m span and 15.06 m length.

Downstream of the Culvert

The channel was dry downstream of the culvert with herbaceous vegetation growing in the middle of the channel (Appendix D Photo 55). A narrow section of channel with no vegetation was present on each side of the channel, indicating water is present at least part of the year, potentially during periods of high flow or precipitation events. During the 5 July 2021 field survey, a 2 m long, 0.2 m wide and 3 cm deep isolated pool was present approximately 5 m downstream of the culvert. A CSP outlet is located immediately downstream of the culvert. Trees are present in proximity to the

culvert outlet, providing >80% cover. Paved landscape is present outside the narrow vegetated riparian area on both sides of the channel.

3.3.2.11 South Service Road Crossing

The watercourse runs south to north, perpendicular to South Service Road, through an approximately 4.5 m wide box culvert. The channel is bordered by trees and shrubs on both sides, upstream and downstream of South Service Road, providing >80% riparian cover. Water levels observed during field investigations are a potential barrier to fish movement.

Upstream of the Culvert

An approximately 10 to 15 m length of the watercourse was visible, with a wetted width and depth ranging from 2 to 4 m and 5 to 12 cm (Appendix D Photo 56), respectively, with no observable flow. Banks were vegetated on both sides and the substrate appeared soft. Industrial development was present east of the riparian area, with undeveloped property containing herbaceous vegetation and shrubs to the west.

Within the Culvert

Shallow water was observed within the 3.67 span and 27.4 m long culvert (Appendix D Photos 57, 58). Dry sections were present with culvert, which contained silt, sand and gravel predominantly within the substrate. Minor cobble was also present.

Downstream of the Culvert

Dense cattail was present within the initial 4 m length of the channel, with a 0.4 m wide opening containing water 0.2 to 5.0 cm deep (Appendix D Photos 59, 60). The wetted width then widened to approximately 2.5 m with shallow water observed. Herbaceous vegetation and shrubs were present along the channel for the initial 6 m length, with trees then dominating the riparian area north of that (Appendix D Photo 61). Undeveloped property containing trees, shrubs and herbaceous vegetation is present east of the channel, with a commercial property containing a large lot with cars west of the channel.

3.3.2.12 North Service Road Crossing

The watercourse runs at a slight northeast angle across the North Service Road. Outside of the culvert the watercourse has been hardened with geogrid material along the bed and banks. Water levels observed during field investigations are a potential barrier to fish movement.

Upstream of the Culvert

Dense phragmites is present within the channel immediately upstream of the culvert for the length of the channel visible from the culvert (Appendix D Photo 62). Wetted width and depth ranged from 0.5 to 3.0 m and 0.5 to 1 cm, respectively (Appendix D Photo 64) and a flat morphology. The riparian area is densely vegetated with trees and shrubs on both sides of the channel.

Within the Culvert

Within the 5 m span and 37.4 m long (approximately) box culvert, water width and depth ranged from 1 to 3.5 m and 0.1 to 0.5 cm, respectively (Appendix D Photo 64).

Downstream of the Culvert

Chain link fence is located above the outlet of the Norther Service Road Culvert. Additionally, fencing along the east side of the channel which borders a commercial property is present. A 4.5 m wide flat area is present downstream of the culvert, bordered by banks >3 m high on each side.

Large cement blocks form the right bank. A 1 to 2 m wide open area with brick/stone flat floor is present in the middle, with dense herbaceous vegetation along each side. Water width and depth ranged from 0 to 1.5 m and 0 to 2 cm, respectively (Appendix D Photos 65 to 67) with slow moving water present during the July field surveys.

Approximately 8 m downstream of the culvert two adjoining box culverts are present, with a 3.8 and 1.5 m span, which outlet to Lake Ontario. Steel bars prevent entrance into these cells. A large opening in the floor of each cell was observed, which allows water to enter Lake Ontario (Appendix D Photos 68, 69). This drop functions as a perched culvert which can limit the ability of small-bodied fish to move upstream into watercourse 5.

This section is approximately 3 m below grade, with commercial development to the east and residential properties immediately west.

3.3.2.13 Fish Community Surveys

Two Electrofishing surveys of approximately 40m and 50m each were conducted in Watercourse 5 on June 29, 2018, however no fish were observed or captured. Additionally fish community surveys via backpack electrofishing, netting and trapping techniques under Licence No. 1098497 from MNRF were completed on 17 June 2021 and 15 July 2021.

On 17 June 2021, two minnow traps (one within the Barton Street culvert, one 245 m north of Barton Street) along with dipnetting were used to assess fish species presence. The traps were left to soak for 6.5 hours with no fish captured. Dipnetting within the accessible portions of Watercourse 5 where PTE was granted did not capture any fish. Additionally, no fish were observed.

On 15 July 2021, electrofishing was conducted within accessible portions of Watercourse 5 where PTE was granted. Starting within the furthest downstream section (WC5-E DS), working upstream, completing the survey at the Residential Driveway Crossing. Surveys were completed using a Halltech backpack electrofisher with one netter, for a total effort of 2,996 seconds. During this survey, no fish were observed or captured.

3.3.2.14 Fish and Fish Habitat

No fish were captured or observed during the three 2021 Wood field investigations, including habitat assessments and fish community surveys. Wood also completed a fish community survey and aquatic habitat assessments in March (fish and habitat) and June (habitat) 2020 between Fruitland Road and Barton Street (within accessible lands) (Wood 2020) and immediately upstream and downstream of the Highway 8 crossing in April and August 2019. No fish were recorded during any of these surveys. No fish species data was available through online databases or background review. Additionally, in previous correspondence with MNRF regarding Watercourse 5, no fish data was available (10 January 2020).

The outlet into Lake Ontario likely serves as a permanent barrier to fish entering the watercourse upstream of Lake Ontario (Appendix D Photo 69), specifically small-bodied fish due to the significant change in watercourse elevation through existing engineered structures. Sections of dry channel and low water level (<0.5 cm) were recorded at every road crossing and in various locations between Barton Street and Fruitland Road (Appendix D Photos 16, 23, 31, 36, 41), during the 2021 surveys, which limits the potential for habitat to support fish and/or provide upstream fish passage (Figure W-2 in Appendix D). Additionally, elevation increases and debris within the channel provide barriers to fish passage (Appendix D Photos 12, 15, 20, 33, 37). These conditions have been observed throughout the watercourse during various years and seasons and channel

characteristics are not indicative of a fish bearing watercourse. Field observations recorded minimal baseflow levels in spring and summer, with potential inputs from stormwater outflows, snow melt and rain events providing temporary inputs into the system. This low baseflow may persist year-round, with shallow, stagnant water and dry sections of channel present. The lack of observable flow, presence of dense aquatic algae and dry portions of channel indicate deteriorating stagnant water conditions, which would also severely limit the potential to support a permanent fish community. Between anthropogenic and natural barriers, the deteriorating remnant standing surface water conditions and minimal to non-discernable baseflow in spring and summer, suggests that this system is very limiting to the overall aquatic community and severely limiting to any fish community.

The combination of background information review including online databases, reports and agency consultation, along with field investigations conducted by Wood in 2019-2021, identify Watercourse 5 through the study area as an intermittent watercourse that appears to be considerably limiting in exhibiting characteristics that support direct fish habitat and as such is concluded to represent indirect fish habitat.

4.0 ASSESSMENT OF SIGNIFICANT NATURAL HERITAGE FEATURES AND POTENTIAL CORE AREAS

4.1.1 Significant Habitat of Endangered and Threatened Species

No Endangered species were documented on or adjacent to the Study Area during inventories and surveys. Threatened species observed during various surveys were limited to Bobolink, Eastern Meadowlark and Chimney Swift.

Surveys indicate that four Chimney Swift were seen foraging over the intersection of Highway 8 (Queenston Road) and Jones Road on June 3, 2015. Single birds were observed foraging over Mountainview Garden Cemetery just north of Highway 8 in 2019 and 2021, and this species was also documented foraging over the Subject lands on June 1, 2023. No suitable nesting structures have been documented in the Study Area, however the regular observations of this species may suggest that it is nesting in the vicinity of the Study Area.

At least four territorial male Bobolink were present in open areas west of Jones Road in 2015, with two of these birds in the southwest corner of the Study Area and two in the northeast corner. Subsequent breeding bird surveys indicated that Bobolink was present in the Study area in 2018 and no Bobolink were observed during breeding bird surveys in 2019, 2021 or 2023. Although this species was not documented in the Study Area since 2018, potential habitat for Bobolink (open country birds) is included in Figure 5. From our observations, it is probable that Bobolinks were historically breeding on the Subject Lands, however further assessment should be completed as part of future work on these lands to verify use by Bobolink and other open country bird species.

Eastern Meadowlark were observed in 2015, with one bird documented in the open fields in the southwest corner of the Study Area and one in the fields in the northeast corner. These birds were observed in the same general locations as Bobolink. The current extent of remaining potential habitat for this species is included on Figure 4. No Eastern Meadowlarks were observed during breeding bird surveys in 2018, 2019, 2021 or 2023. Similar to Bobolink, it is recommended that further assessment should be completed as part of future work on these lands to verify use by Eastern Meadowlark and other open country bird species.

As part of our assessment, we completed a Species at Risk Screening for the Study Area based on data available from the Ministry of Natural Resources and Forestry (MNRF 2018) (Appendix E). Information available from NHIC in close proximity to the Subject Lands indicated that three endangered species (Jefferson Salamander, Cucumber Tree and Butternut), as well as the Threatened Bank Swallow have been documented in this area. Typical habitat for all of these species is not present on the Subject Lands and none of these species were documented during botanical inventories and wildlife surveys.

4.1.2 Other Potential Species of Conservation Concern

Special Concern Species documented during survey work include Barn Swallow, Eastern Wood-pewee and Grasshopper Sparrow.

Barn Swallows were observed foraging above the Study Area during bird surveys in 2015, 2018, 2019, 2021 and 2023. Outbuildings were documented on several properties in the Study Area and could be used by this species during breeding, however none of these structures were confirmed to be providing nesting habitat for Barn Swallows. It is therefore our assessment that the Subject Lands are providing opportunistic foraging habitat for Barn Swallows, but no nests were documented on or adjacent to the Subject Lands. It is recommended that assessments for nesting use of structures be completed in the future as needed prior to the removal of any buildings or structures that could be providing habitat for Barn Swallows.

One Eastern Wood-pewee was heard singing during the first breeding bird survey in 2021 in the northwest section of the Study Area, near the intersection of Fruitland Road and Barton Street. An Eastern Wood-pewee was also heard calling from a woodland north of the study area during the first breeding bird survey in 2023. Both of these observations are considered to be transient males and are not considered to represent nesting pairs in the study area. It is not likely that significant habitat for this species is present in or adjacent to the Study Area.

Grasshopper Sparrow was documented as a possible breeder on the Subject Lands in 2018. This species was not observed during any other breeding bird survey, and it is likely that this species was more incidentally using habitats available in the Study Area. Suitable habitat for this species is no longer considered to be present in the Study Area.

Based on information provided by MNRF, Special Concern Species known to occur in the vicinity of the Study Area include Wood Thrush, Peregrine Falcon, Red-headed Woodpecker and Snapping Turtle. Our assessment indicates that typical habitat for these species is not present on the Subject Lands and none of these species were observed during inventories and surveys.

In addition to the above, NHIC data indicates that Shreber's Aster (S2), and Hairy Green Sedge (S3) have been documented in the vicinity of the Subject Lands. Hairy Green Sedge was documented on the southern edge and south of FODM9-6a during botanical inventories. Shreber's Aster was not documented during inventories, and therefore the Subject Lands do not provide habitat for this species.

4.2 Significant Wildlife Habitat

4.2.1 Seasonal Concentration Areas of Animals

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E identifies 14 types of seasonal concentrations of animals that may be considered significant wildlife habitat. These include, but are not limited to:

- Waterfowl Stopover and Staging Areas (Aquatic and Terrestrial);
- Shorebird Migratory Stopover Area;
- Raptor Wintering Area;
- Bat Hibernacula;
- Bat Maternity Colonies;
- Turtle Wintering Areas;
- Reptile Hibernaculum;
- Colonially -Nesting Bird Breeding Habitat (Bank and Cliff);
- Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs);
- Colonially -Nesting Bird Breeding Habitat (Ground);
- Migratory Butterfly Stopover Areas;
- Landbird Migratory Stopover Areas; and
- Deer Winter Congregation Areas.

Seasonal concentration areas are typically designated as significant wildlife habitat if an area supports a species at risk or a large population may be lost if the habitat is destroyed. As indicated above, scattered trees within the Study Area have the potential to provide roosting habitat for various species of bats. Since this type of habitat is dynamic and was not studied extensively as part of this project, it is recommended that further assessment of potential roosting habitat be completed as part of site specific EIS's.

Aside from potential bat roosting habitat areas illustrated in Figure 5, none of these types of seasonal concentrations of animals were observed or documented in the Study Area. An assessment of SWH is provided in Appendix F.

4.2.2 Rare Vegetation Communities

Rare vegetation communities often contain rare species, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. Those areas that qualify as rare habitats are assigned an SRank of S1, S2 or S3 by the Natural Heritage Information Center (NHIC).

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E identifies 7 specialized habitats that may be considered significant wildlife habitat. They are:

- Cliffs and Talus Slopes;
- Sand Barren;
- Alvar;
- Old Growth Forest;
- Savannah;
- Tallgrass Prairie; and
- Other Rare Vegetation Communities.

No rare vegetation communities are present on or adjacent to the Subject Lands.

4.2.3 Specialized Habitats of Wildlife considered SWH

Some wildlife species require large areas of suitable habitat for their long-term survival and many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations are at risk of decline when habitat becomes fragmented or reduced in size

Specialized habitats for wildlife include:

- Waterfowl Nesting Area;

- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat;
- Woodland Raptor Nesting Habitat;
- Turtle Nesting Areas;
- Seeps and Springs;
- Amphibian Breeding Habitat (Woodland);
- Amphibian Breeding Habitat (Wetlands); and
- Woodland Area-Sensitive Bird Breeding Habitat.

Amphibian vocalization surveys were conducted in various locations throughout the Study Area to assess amphibian use of wetland vegetation communities and areas of seasonal standing water. Assessments indicate that these areas are providing potential breeding habitat for Western Chorus Frog, Northern Leopard Frog and American Toad, however it does not appear that the hydroperiods of most of these areas are sufficient to sustain successful recruitment. Therefore, it is our conclusion that no specialized habitats for wildlife are located on the Subject Lands.

4.2.4 Habitats of Species of Conservation Concern considered SWH

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species as identified by the Endangered Species Act. The following habitats are considered candidate SWH:

- Marsh Breeding Bird Habitat;
- Open Country Bird Breeding Habitat;
- Shrub/Early Successional Bird Breeding Habitat;
- Terrestrial Crayfish; and
- Special Concern and Rare Wildlife Species.

As described above, Eastern Wood-pewee and Grasshopper Sparrow were documented within the Study Area during various surveys. Suitable habitat for Grasshopper Sparrow is no longer considered to be present in the Study Area and breeding use of the lands by Eastern Wood-pewee was not confirmed.

Breeding bird surveys completed since 2015 indicate periodic use of thicket habitats by early successional bird species. Brown Thrasher was documented on the site in 2015, along with regular observations of Willow Flycatcher and Field Sparrow during more recent surveys (see Appendix C). Because Brown Thrasher has not been identified on site since 2015, no portion of the Subject Lands are considered to continue to support early successional breeding bird habitat.

Observations of the Study Area during breeding bird surveys also indicates that portions of the Study Area may be providing foraging habitat for Barn Swallows. Because foraging habitat for this species is highly variable, foraging habitat for this species is not generally considered significant wildlife habitat. However, since adequate foraging habitat in the vicinity of nests is required to support this species during breeding, it is recommended that site specific assessments for active nests and individual assessments of potential foraging needs be assessed as part of future inventories of properties in the Study Area.

4.2.5 Animal Movement and Migration Corridors

The SWHTG defines animal movement corridors as elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another. To qualify as significant wildlife habitat, these corridors should be a critical link between habitats that are regularly used by wildlife.

Based on our review of air photos and mapping, no portion of the Study Area forms part of a Migration Corridor. Watercourses 5 and 6 may be providing some minor linkage function to allow for species such as Eastern Cottontail and Grey Squirrel to move between vegetation communities at the north and south limits of the Subject Lands, however since there are limited natural heritage features located north of Barton Street, west of Fruitland Road or south of Highway 8, the Subject Lands do not form part of a migration corridor.

4.3 Significant Areas of Natural and Scientific Interest (ANSI)

No Areas of Natural and Scientific Interest are located on or adjacent to the Subject Property.

4.4 Significant Woodlands

A woodland in this part of the City of Hamilton must meet two or more of the following criteria to be considered significant:

a) Size – Be greater than 2ha and average more than 40m in width;
b) Interior Forest Habitat – Provide interior forest habitat that is located a minimum of 100 metres from a woodland edge;
c) Proximity/Connectivity - Be 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);
d) Proximity to Water – Be located within 30 metres of any hydrological feature, including all streams, headwater areas, wetlands, and lakes;
e) Woodland Age – Contain 10 or more native trees/hectare greater than 100 years old; or
f) Rare Species – Provide habitat for any threatened, endangered, special concern, provincially or locally rare species.

Table 3: Assessment of Significant Woodland Criteria.

Criterion	Polygon				
	FODM9-6a	**FODM9-6b**	**FODM7-2**	**WODM5**	**CUW1**
Size	0.71ha	0.31ha	0.43ha	0.69ha	0.89ha
Interior Habitat	No	No	No	No	No
Proximity/ Connectivity	No	No	No	No	No
Proximity to Water	No	No	No	Yes	Yes
Age	No	No	No	No	No
Rare Species	Potentially	Potentially	No	No	No
Total Criteria Satisfied	1 (potential)	1 (potential)	0	1	1
Assigned Significant Woodland Status	No	No	No	No	No

Based on our review of background information, no Significant Woodlands have been previously identified within the Subject Lands between Fruitland Road and Jones Road. This assessment confirmed that no woodlands located within this area satisfy the criteria to be considered Significant Woodland (see Table 3).

This assessment also suggests that woodland communities WODM5 and CUW1 do not satisfy the criteria to be considered Significant Woodlands, however since these woodlands were not studied as extensively as woodlands east of Jones Road, it is recommended that further assessment of these features be completed in the future to verify the conclusions of this report.

4.5 Streams

As described above, two watercourses (Watercourse 5 and Watercourse 6) traverse the Study Area. Assessments completed as part of this EIS confirm that these watercourses are warmwater, intermittent watercourses, which contribute to fish habitat downstream of the Subject Lands.

To protect the integrity and ecological functions of Watercourse 5 and riparian areas, it is recommended that a buffer of 15m be established on each side of the watercourse from the bankfull channel. The approximate extent of the 15m buffer is illustrated in Figure 5.

It is understood that the flood and erosion hazards associated with Watercourse 5 have been delineated through appropriate modeling studies. Based on our assessment, it does not appear that any buffers from the flood or erosion hazards beyond what is recommended above for the protection of ecological functions of Watercourse 5 are warranted on these lands.

The proposed relocation of Watercourse 5 will create an opportunity to provide appropriate buffering, riparian enhancement, and incorporate in stream habitat features which will result in an overall net environmental benefit to watercourse.

It is understood that the flood and erosion hazards associated with watercourse 6 have not yet been fully defined. It is recommended that the limit of these hazards be determined and any lands to be included within the hazard areas managed appropriately.

4.6 Wetlands

Our assessment indicates that vegetation communities on the Subject Lands (other than lands under appeal) are limited to a small pocket of Graminoid Mineral Meadow Marsh Ecosite (MAMM1) on the southern portion of the Subject lands north of Highway 8. This wetland is not of sufficient size or function to warrant evaluation and is not considered to meet the UHOP definition of wetland.

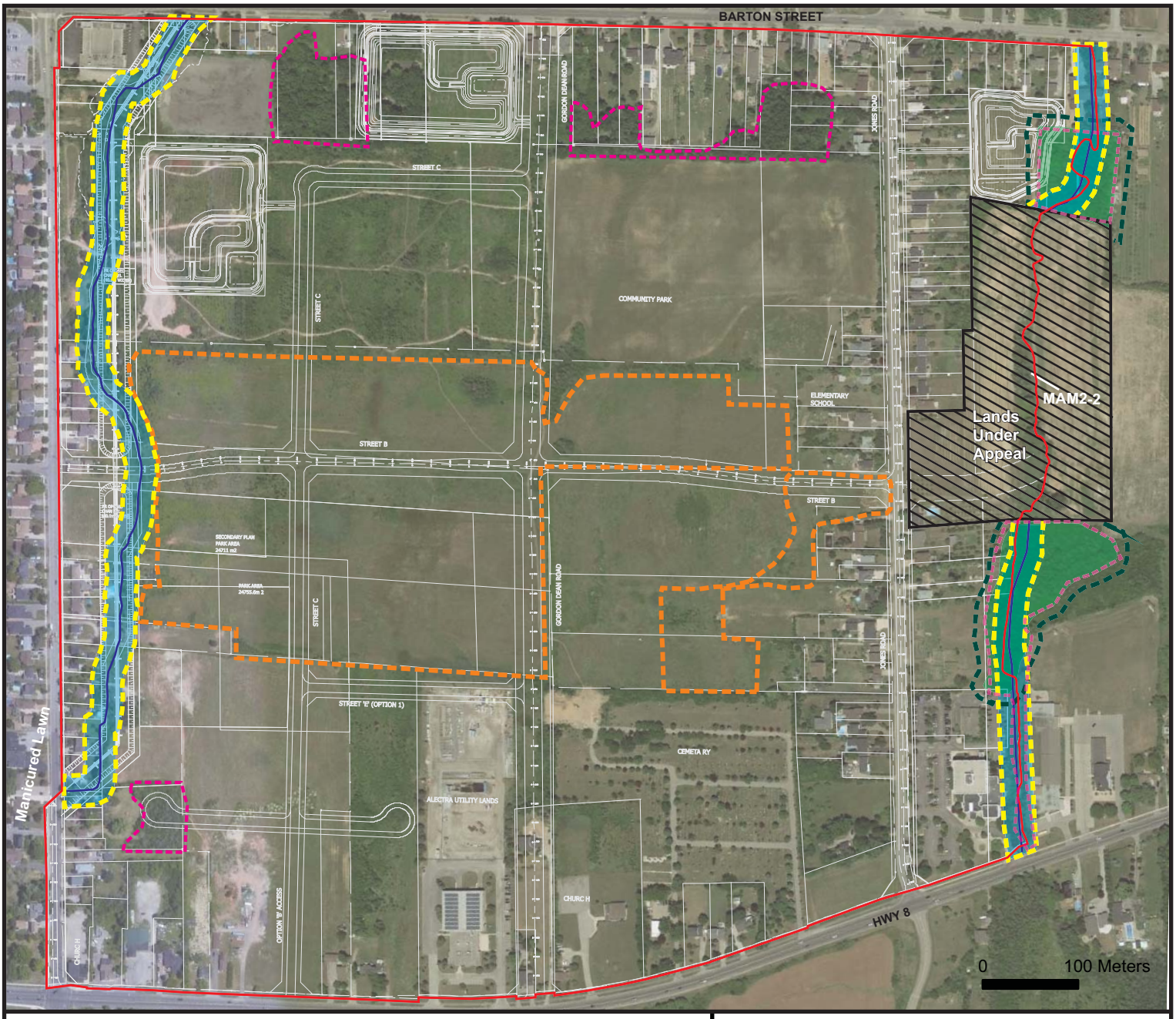
Several small depressional areas within the cultural meadow/cultivated area exhibited characteristics of meadow marsh, however these areas were too small to map as inclusions.

Because these wetland communities are too small and low functioning to evaluate using the Ontario Wetland Evaluation System (OWES), it is our assessment that no portion of the Subject Lands meets the definition of wetland in the UHOP.

4.7 Linkages

Based on our review of background mapping, Linkages have been identified in association with Watercourses 5 and 6. Linkages are defined in the Urban Hamilton Official Plan as natural areas within the landscape that ecologically connect Core Areas. Linkages are intended to act as avenues along which plants and animals can propagate, genetic interchange can occur, populations can move in response to environmental changes and life cycle requirements, and species can be replenished from other natural areas.

Based on our assessment and review of background information, no Core Areas are located upstream or downstream of Watercourse 5 outside of the Study Area. Although Watercourse 5 and the adjacent lands do not serve to connect Core Areas, the 15m buffer recommended from the watercourse will be more than sufficient in size to maintain the movement of plant and animal species observed during assessments.



Legend

- Study Area
- Watercourses
- 15 Metre Watercourse Buffer
- Linkages
- Woodlands
- 10 Metre Buffer from Woodlands
- Extent of Potential Bobolink/Open Country Bird Habitat
- Extent of Potential Bat Roosting Habitat

N
W E
S

Notes: Woodlands associated with Watercourse 6 are to be assessed further as part of Block 2 investigations. A buffer of 10m has been applied for the purpose of this assessment, but is subject to future refinement.
Draft Plan: Fruitland Block 1 BSS ACAD-20-263-BASE.dwg

Figure 5
Refined Extent of Natural Heritage Features on the Subject Lands

Environmental Impact Statement
Block 1 Lands, City of Hamilton

Prepared for: **Fruitland-Winona Block 1 Owners**

Prepared by: COLVILLE CONSULTING INC.

Date: March 2024

File: C18028

Our review of Schedule B of the Rural Hamilton Official Plan indicates that a small Core Area is located south of Highway 8 and is partially associated with Watercourse 6, however no Core Areas associated with Watercourse 6 occur north of Barton Street. Similar to Watercourse 5, Watercourse 6 does not serve as a linkage between Core Areas outside of the Study Area, and therefore does not meet the intent of Linkage.

5.0 ENVIRONMENTAL POLICY

5.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) was issued under Section 3 of the Planning Act and came into effect on May 22, 1996. The PPS was updated in 1997 and more recently in 2020. It applies to all applications submitted after March 1, 2005 and states that decisions affecting planning matters "shall be consistent with" policy statements issued under the Act. This EIS has been prepared in compliance with Part V, Policy 2.1 of the PPS, which deals specifically with the long-term protection and management of natural heritage features and areas.

The intent of the PPS is to ensure that natural features and areas be protected for the long term. The PPS indicates that 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.

Natural heritage features and areas are defined in the PPS as those which are important for their environmental and social values as a legacy of the natural landscapes of an area and include: significant wetlands, significant coastal wetlands, fish habitat, significant woodlands south and east of the Canadian Shield, significant valleylands south and east of the Canadian Shield, significant habitat of endangered species and threatened species, significant wildlife habitat and significant areas of natural and scientific interest.

As indicated in Section 2.1.4, development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E and 7E1 and within significant coastal wetlands.

Unless it can be demonstrated that there will be no negative impacts on the natural heritage features or their ecological functions, development and site alteration is not permitted in or adjacent to:

- significant woodlands and valleylands south and east of the Canadian Shield;
- significant wildlife habitat;
- significant fish habitat; and
- significant areas of natural and scientific interest.

Development and site alteration shall not be permitted on adjacent lands to the natural heritage features identified above, 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.

5.2 City of Hamilton - Urban Hamilton Official Plan

The Urban Hamilton Official Plan (UHOP) is the first OP for the amalgamated communities of Ancaster, Dundas, Flamborough, Glanbrook, Hamilton and Stoney Creek (July 2009). This official

plan is intended to replace the Region of Hamilton-Wentworth OP and the six OPs representing the former municipalities.

During the preparation of the UHOP, the City of Hamilton has created a Natural Heritage System, which is comprised of Core Areas and Linkages that are recognized as Key Natural Heritage Features, Key Hydrologic Features and Local Natural Areas. Key Natural Heritage Features include features such as significant habitat of endangered, threatened, and special concern species, fish habitat, wetlands, Life Science Areas of Natural and Scientific Interest (ANSIs), significant valleylands, significant woodlands and significant wildlife habitat. Key Hydrologic Features include features such as permanent and intermittent streams, seepage areas and springs, and wetlands.

Within the UHOP are a series of policies relating to the management of natural heritage features and the Natural Heritage System. These policies are contained within Section C2.0 of the UHOP and are intended to achieve the following goals:

- Protect and enhance biodiversity and ecological functions;
- Achieve a healthy, functional ecosystem;
- Conserve the natural beauty and distinctive character of Hamilton's landscape;
- Maintain and enhance the contribution made by the Natural Heritage System to the quality of life of Hamilton's residents; and
- Restore and enhance connections, quality and amount of natural habitat.

To assist in attaining the above goals, the UHOP includes specific policies which relate to the management of natural heritage features. The policy sections relevant to this property are included below.

Section C2.2.2 – The boundaries of Core Areas and Linkages, shown on Schedule B - Natural Heritage System, are general in nature. Minor refinements to such boundaries may occur through Environmental Impact Statements, watershed studies or other appropriate studies accepted by the City without an amendment to this Plan. Major changes to boundaries, the removal or addition of Core Areas and Linkages identified on Schedule B - Natural Heritage System and Schedules B-1-8 – Detailed Natural Heritage Features require an amendment to this Plan.

Section C2.2.7 – Where properties contain two or more overlapping natural features of differing significance which overlap in the Natural Heritage System, the more restrictive policies pertaining to those natural features shall apply. If more than one policy applies to a natural feature the more restrictive policy shall apply.

Section C2.2.8 – All natural features, required vegetation protection zones, and enhancement or restoration areas on a property shall be placed under appropriate zoning in the zoning by-law and/or protected through a conservation easement to the satisfaction of the City or the relevant Conservation Authority.

Section C2.3 – It is the intent of this policy to preserve and enhance Core Areas and to ensure that any development or site alteration within or adjacent to them shall not negatively impact their natural features or their ecological functions.

Section C2.3.3 – The natural features and ecological functions of Core Areas shall be protected and where possible and deemed feasible to the satisfaction of the City enhanced. To accomplish this

protection and enhancement, vegetation removal and encroachment into Core Areas shall generally not be permitted, and appropriate vegetation protection zones (VPZ) shall be applied to all Core Areas.

Section C2.5.3 – New development and site alteration shall not be permitted within fish habitat, except in accordance with provincial and federal requirements.

Section C2.5.4 – New development and site alteration shall not be permitted within significant woodlands, significant valleylands, significant wildlife habitat and significant areas of natural and scientific interest unless it has been demonstrated that there shall be no negative impacts on the natural features or on their ecological functions.

Section C2.5.5 – New development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in Section C.2.5.2 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.

Section C2.5.8 – New development or site alteration subject to policies C2.5.3 to C2.5.7 requires, prior to approval, the submission and approval of and 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 Areas or their ecological functions;

b) Connectivity between Core Areas shall be maintained, or where possible, enhanced for the movement of surface and groundwater, plants and wildlife across the landscape; and

c) The removal of other natural heritage features shall be avoided or minimized by the planning and design of the proposed use or site alteration wherever possible.

Section C2.5.9 - An Environmental Impact Statement shall propose a vegetation protection zone which 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, restores or enhances the Core Area and/or its ecological functions.

Section C2.5.10 – Where vegetation protection zone widths have not been specified by watershed and sub-watershed plans, secondary plans, 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.

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

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

iii) Significant Valleylands – As required by the relevant Conservation Authority; and

iv) 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.

Section C2.5.11 – Vegetation protection zone widths greater or less than those specified 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.

Section C2.5.12 – 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.

Section C2.5.13 – 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.

5.3 Hamilton Conservation Authority

The Hamilton Conservation Authority (HCA) is responsible for reviewing development applications within its jurisdiction pursuant to the Conservation Authorities Act and Ontario Regulation 41/24. At the time of this report, policies to assist with administration of the act and regulation are not available, and therefore it is assumed that HCA review of any proposed development activities on these lands will be limited to the assessment of potential affects on the control of flooding, erosion, dynamic beaches or unstable soil or bedrock.

Features regulated by the HCA on the Subject Lands (excluding lands under appeal) primarily consist of Watercourses 5 and 6, as well as the associated flood and erosion hazards. A secondary channel of Watercourse 5 has also been identified in HCA mapping on the central portion of the Block 1 lands, however this feature lacked definition on site and was not assessed as part of this study.

6.0 RECOMMENDED CORE AREAS AND NATURAL HERITAGE SYSTEM

Based on this assessment, significant natural heritage features in the Study Area are limited to Watercourses 5 and 6, as well as potential habitat of Open Country Birds (primarily Bobolink and Eastern Meadowlark) and potential bat roosting habtiat (see Figure 5). For the purposes of this assessment, it is recommended that a 15m buffer/VPZ be incorporated with both Watercourses 5 and 6, with the VPZ's providing Linkage functions as well as buffer potential impacts associated with future development.

Please note that woodlands associated with Watercourse 6 have been identified on Figure 5, despite not meeting the criteria for Significant Woodland. As these woodlands were not assessed in detail as part of this study, these woodlands continue to be identified out of an abundance of caution. Further assessment of these woodlands is recommended as part of investigations associated with Block 2.

7.0 IMPACT ASSESSMENT

7.1 Proposed Development

The current Block 1 Development Concept Plan (Urbantech November 2021) for the Block 1 lands includes two arterial roads, a mixture of low to medium density residential zones, as well as commercial and institutional uses, community and neighbourhood parks, stormwater management facilities, utility, and general open space. The extent of the arterial roads and stormwater management facilities are illustrated in Figure 5.

In addition to the proposed land uses, Watercourse 5 will be relocated to a watercourse block, which will also incorporate the associated floodplain, meander belt and vegetation protection zones.

The following is a preliminary assessment of potential impacts likely associated with the proposed development of these lands.

7.2 Terrestrial

Based on the conceptual plan, the following impacts may or will occur when the plan is implemented, affecting identified NHS features and ecological functions.

Direct Impacts

- Potential encroachment into NHS features during channel re-construction;
- Removal of potential open country habitat which may support avian Species at Risk and other associated species, and conversion to a variety of residential-focused urban land uses;
- Disturbance or destruction of nesting birds by clearing and grading works;
- Major road crossings of Watercourses 5 and 6, affecting aquatic habitat as well as previously disturbed riparian and wetland communities currently associated with the watercourses;
- Relocation and reconstruction of portions of Watercourses 5, and potentially Watercourse 6; and
- Introduction of stormwater management infrastructure adjacent to the NHS – ponds, outlets etc.

Indirect Impacts

- Potential erosion and sedimentation during construction;
- Alteration of existing drainage patterns, and introduction of impervious cover affecting runoff rates;
- Displacement or confinement of existing wildlife; future development will restrict key wildlife groups to the NHS and 'softer' landscape elements such as stormwater management facilities; and
- Introduction of stormwater management facilities and restored channel corridors offering long term 'green infrastructure' i.e. successional habitat and associated ecological functions.

Roads and Grading Impacts

With respect to grading, preliminary road grades provided by Urbantech indicate that the arterial roads will generally respect existing grades; however, surface flows from development lands will be directed into the stormwater system and outlet to one of three proposed stormwater facilities to be located near Barton Street. This will require some moderate increasing of grades at the draft plan scale to direct runoff towards the front of lots and building sites, and toward the arterial roads.

Construction of the road network will require the removal of vegetation from various areas of the Subject Lands. A majority of these roads will have no impact on significant natural heritage features, however vegetation removal will be required. It is recommended that appropriate mitigation measures below be incorporated during construction to help avoid impacts to wildlife in the area.

As illustrated in Figure 5, a crossing of Watercourse 5 has been proposed. It is anticipated that this crossing will be designed to convey storm flows and have little impact on the channel of the watercourse. Although wildlife movement in the area was observed to be limited, it is recommended that the culvert to be installed be designed to assist with wildlife passage under the roadway. Details and features to be incorporated should be discussed at detailed design.

Stormwater Management Ponds

As illustrated in Figure 5, three stormwater management facilities are proposed within the Study Area. The stormwater pond to be constructed in the northwest corner of the Block is proposed to be constructed in an area that is vegetated with scattered trees and shrubs. Removal of vegetation will be required to construct this pond, however our assessment indicates that this vegetation is not providing any significant habitat functions. It is recommended that a more detailed assessment of potential impacts to trees and vegetation be completed when designs have been finalized, however no impacts to significant natural heritage features are anticipated.

The stormwater pond located at the end of the Block is proposed to be constructed in an area with few trees or any observed natural heritage features. Construction of this pond will have no impact on natural heritage features, however it is recommended that trees be retained around the pond where possible.

The stormwater pond proposed in the northeast corner of the block is proposed to be constructed primarily within a small vineyard and adjacent to a suspected woodland. Removal of vegetation associated with the vineyard will have no impact on adjacent natural heritage features. It appears that a small portion of the woodland may be required to be removed to construct the pond in this area, however this woodland was not assessed during our surveys and the extent of the woodland on the affected property has not been verified. It is anticipated that the majority of grading associated with this pond will occur adjacent to the woodland, however it is recommended that an assessment of potential impacts to trees in the woodland be completed when detailed designs are available. This pond will have no impact on the observed functions of Watercourse 6.

Watercourse Relocation

Relocation of Watercourse 5, and profile adjustments to create a more consistent gradient, will reduce barriers to fish movement, and will produce more uniform floodplain conditions to allow for wetland creation. Based on a preliminary design which accommodates a 23m meander belt, GEOMorphix has estimated that up to 0.6 ha of new floodplain wetlands will ultimately be created.

Currently the channels of Watercourses 5 and 6 are extensively impacted by adjacent land uses, resulting in fragmented pockets of quality riparian vegetation. We recommend that a range of vegetation communities and habitat types be targeted for restoration within the new watercourse corridor, including upland woodland and thicket in the VPZs and on slopes, and marsh and thicket swamp in the floodplains. Offline depressions can also help diversify vegetation communities on these lands.

Although detailed designs have yet to be prepared, it is recommended that natural channel design features be incorporated into the relocated channel. This will help ensure a stable channel profile and minimize the potential for erosion. It is recommended that only native plants be incorporated into restoration areas and that the restoration areas be monitored periodically to ensure success of plantings and manage for invasive species as needed.

Based on the current preliminary grading information, areas that do not drain to the stormwater management system will likely be confined to the west side of Watercourse 5, and to the developments west of Watercourse 6. Clean runoff from rooftops and backyards in this area can benefit both the watercourse and restored or created habitats that are contained within the NHS corridors. Impacts are intended to be addressed through a variety of measures, including feature protection, VPZ's and mitigation to be determined through scoped Environmental Impact Statements as part of draft plans of subdivision.

8.0 MITIGATION MEASURES

Mitigation measures will be provided based on site-specific designs, however the following are a list of preliminary mitigation measures to be considered during detailed design and staging.

- It is recommended that watercourse crossings be designed with the input of the Fluvial Geomorphologist to assist with minimizing impacts to the meander belt associated with Watercourses 5.
- Adequate sediment and erosion controls should be installed prior to the commencement of work to help prevent any off-site movement of soil material during construction. Sediment controls should remain in place until all disturbed areas have been vegetated and stabilized.
- Any required tree removal should be conducted between September 15 and March 30 to avoid impacting nesting birds or roosting bats in the area.
- The use of street lighting in the vicinity of the watercourses should be minimized where possible. Appropriate shading or directional lighting is recommended where needed to minimize light pollution into restoration areas.
- It is recommended that the use of LID technologies be considered where possible to lessen the volume of runoff and promote infiltration.
- Continuous fencing should be installed at the rear of each lot backing onto the watercourse blocks to limit the potential for encroachment into VPZ's.
- It is recommended that grading be avoided where possible in designated VPZ's. Where grading is required to occur, it is recommended that a restoration plan be prepared to ensure the affected VPZ will continue to function as intended.
- It is recommended that MECP be engaged early in the design process to discuss Species at Risk requirements and maintain compliance with the ESA.

- Several locally rare and uncommon species were documented in the Study Area during our assessments. To help maintain these species in the area, it is recommended that any locally rare or uncommon species be identified and assessed for relocation to parklands and VPZ's within the Block. Further assessment and planning for relocations should occur as part of future site specific assessments.

9.0 RECOMMENDATIONS

The primary intent of this project is to characterize natural heritage features on the Subject Lands and delineate the extent of any Core Areas as defined by the UHOP. Core Areas on the Subject Lands consist of Watercourse 5 and Watercourse 6. Watercourses 5 and 6 were determined to be intermittent warmwater watercourses, which are providing contributions to fish habitat downstream of the Subject Lands. To protect the integrity of the watercourses, it is recommended that a 15m buffer be established from the edge of the bankfull channel, on both sides of the watercourse. This watercourse buffer will also serve to maintain any linkage between areas upstream and downstream of the Subject Lands.

In addition to Watercourses 5 and 6, our assessment indicates that potential bat roosting habitat is located in treed areas along the north end of the Study Area, as well as along Watercourse 6 and in an isolated thicket in the southwest corner of the Study Area. It is recommended that bat use of these areas be further assessed prior to tree removals.

From our assessment, a portion of the Subject Lands consists of a cultural meadow/cultivated area that has historically provided potential breeding habitat for Bobolink and Eastern Meadowlark. The extent of potential Open Country habitat is delineated in Figure 5. As this area is less than 30ha in size, it is recommended that MECP be contacted prior to any detailed designs for the Subject Lands to discuss any obligations to remain compliant with the Endangered Species Act.

Although this report includes identified VPZ's adjacent to Watercourses 5 and 6, as well as suspected woodland features, it is recommended that the appropriateness of these buffers be assessed as part of future development application, when detailed designs have been completed. Any adjustments to these VPZ's should be aligned with policies within the UHOP.

Please do not hesitate to contact the undersigned should you have any question regarding this project.

Respectfully submitted by:

Ian Barrett, M.Sc.
Colville Consulting Inc.

10.0 LITERATURE CITED

Aquafor Beech Limited. 2013. SCUBE Subwatershed Study: Phase 3: Implementation. 114pp.

Cadman, M. D., D. A. Sutherland, G. G. Beck, D. Lepage and A. R. Couturier (eds.). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp.

City of Hamilton. 2014. Urban Hamilton Official Plan. City of Hamilton.

City of Hamilton. 2018. Fruitland-Winona Secondary Plan. City of Hamilton.

Dillon Consulting Ltd. 2010. Natural Heritage Assessment of Lands Bounded by Fruitland Road, Glover Road, Barton Street, and Highway 8, City of Hamilton. City of Hamilton report. 139 pp

Dougan and Associates. 2017. Fruitland-Winona Block 1 Servicing Strategy Environmental Assessment & Natural Heritage System Plan. 38pp.

Fisheries and Oceans Canada (DFO). 2021. Aquatic SAR mapping. http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Goodban, A.G. 2014. The Vascular Plants of Hamilton, Ontario. pp. 1 to 91, In: Schwetz, N. (ed.), Hamilton Natural Areas Inventory Project 3rd Edition, Nature Counts 2, Species Checklist Document. Hamilton Conservation Authority, Ancaster, Ontario.

Hamilton Conservation Authority. 2013a. What's Alive in Hamilton – Bird Checklist 2013. (data source Hamilton Natural Areas Database, 2013).

Hamilton Conservation Authority. 2013b. What's Alive in Hamilton – Reptile and Amphibian Checklist 2013. (data source Hamilton Natural Areas Database, 2013).

Lee, H.T., W.D. Bakowsky, J.L. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Community Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Ministry of Northern Development and Mines, Natural Resources and Forestry, 2021. Natural Heritage Information Centre (NHIC) Online Make-a-Map

Oldham, M.J. and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Ontario Ministry of Natural Resources, Peterborough, Ontario. 188 pp.

Ontario Ministry of Natural Resources, 2000. Significant Wildlife Habitat Technical Guide. 151 pp

Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for natural heritage policies of the Provincial Policy Statement, 2005. Second Edition. Toronto, ON: Queen's Printer for Ontario. 248 pp.

Ontario Ministry of Natural Resources and Forestry. 2014. Significant Wildlife Habitat Mitigation Support Tool. 533 pp.

Ontario Ministry of Natural Resources and Forestry. 2017. Survey Protocol for Species at Risk Bats within Treed Habitats - Little Brown Myotis, Northern Myotis & Tri-Colored Bat. Ontario Ministry of Natural Resources and Forestry Guelph District. 13pp.

Ontario Ministry of Natural Resources. 2018. Hamilton SAR. Guelph, ON: Ontario Ministry of Natural Resources, Guelph District. 4 pp.

Peck, G.K., and R.D. James. 1987. Breeding birds of Ontario: Nidiology and distribution. Volume 2: passerines. Life Sciences Miscellaneous Publications, Toronto, ON: Royal Ontario Museum. 387 pp.

Schwetz, N. 2014. Hamilton Natural Areas Inventory Project 3rd Edition, Site Summaries Document. Hamilton Conservation Authority. 752pp.

Wood. 2020. Aquatic Assessment Report Gordon Dean Avenue - Schedule 'C' Municipal Class Environmental Assessment (Phases 3 & 4)

Appendix A

Vascular Plant Checklist

Scientific Name	Common Name	G Rank	S Rank	COSEWIC	COSSARO	Lrank	CoeCons	CoeWet
Abutilon theophrasti	Velvetleaf	G?	SE5				-	4
Acer negundo	Manitoba Maple	G5	S5				0	-2
Acer platanoides	Norway Maple	G?	SE5				0	5
Acer rubrum	Red Maple	G5	S5				4	0
Achillea millefolium ssp. millefolium	Common Yarrow	G5	SE				0	3
Agrimonia sp	Agrimony Species	-	-				-	-
Agrostis stolonifera	Creeping Bentgrass	G5	SNA				0	-3
Alisma triviale	Northern Water-plantain	G5	S5				1	-5
Alisma plantago-aquatica	Common Water-plantain	G5	S5				3	-5
Alliaria petiolata	Garlic Mustard	GNR	SNA				0	0
Allium canadense var. canadense	Wild Garlic	G5	S5				8	3
Allium schoenoprasum var. schoenoprasum	European Chives	G5T5	SNA				0	-1
Amaranthus sp	Pigweed Species	-	-				-	-
Ambrosia artemisiifolia	Common Ragweed	G5	S5				0	3
Antennaria parlinii ssp. fallax	Deceitful Pussytoes	G5T4T5	S5				2	5
Anthemis arvensis	Corn Chamomile	G?	SE5				0	5
Arctium minus ssp. minus	Common Burdock	G?	SE5				0	5
Arisaema triphyllum ssp. triphyllum	Jack-in-the-pulpit	G5	S5				5	-2
Asclepias syriaca	Common Milkweed	G5	S5				0	5
Asparagus officinalis	Asparagus	G5?	SE5				0	3
Aster ericoides var. ericoides	Heath Aster	G5	S5				4	4
Aster lanceolatus ssp. lanceolatus	Panicled Aster	G5	S5				3	-3
Aster novae-angliae	New England Aster	G5	S5				2	-3
Aster pilosus var. pilosus	Hairy Aster	G5	S5				4	2
Barbarea vulgaris	Bitter Wintercress	GNR	SNA				0	0
Berberis vulgaris	Common Barberry	G?	SE5				0	3
Betula sp	Birch Species	-	-				-	-
Bidens cernua	Nodding Beggar-ticks	G5	S5				2	-5
Bidens frondosa	Devil's Beggar-ticks	G5	S5				3	-3
Bidens sp	Beggar's Ticks Species	-	-				-	-
Bromus commutatus	Hairy Brome	GNR	SNA				0	5
Bromus inermis ssp. inermis	Smooth Brome	G4G5	SE5				0	5
Calystegia sepium ssp. angulata	Hedge Bindweed	G5T5	SU				2	0
Campanula rapunculoides	Creeping Bellfower	GNR	SNA				0	5
Carex arctata	Drooping Wood Sedge	G5?	S5				5	5
Carex bebbii	Bebb's Sedge	G5	S5				3	-5
Carex blanda	Woodland Sedge	G5	S5				3	0
Carex gracillima	Graceful Sedge	G5	S5				4	3
Carex hirsutella	Hairy Green Sedge	G5	S3				8	5
Carex hystericina	Porcupine Sedge	G5	S5				5	-5
Carex molesta	Troublesome Sedge	G4	S4S5				5	2
Carex projecta	Necklace Sedge	G5	S5			u	5	-4
Carex rosea	Stellate Sedge	G5	S5				5	5
Carex scoparia	Pointed Broom Sedge	G5	S5				5	-3
Carex sp	Sedge Species	-	-				-	-
Carex spicata	Spiked Sedge	GNR	SNA				0	5

Scientific Name	Common Name	G Rank	S Rank	COSEWIC	COSSARO	Lrank	CoeCons	CoeWet
Carex stipata	Awl-fruited Sedge	G5	S5				3	-5
Carex tenera	Tender Sedge	G5	S5				4	-1
Carex tribuloides	Blunt Broom Sedge	G5	S4				5	-4
Carex vulpinoidea	Fox Sedge	G5	S5				3	-5
Carya cordiformis	Bitternut Hickory	G5	S5				6	0
Carya ovata	Shagbark Hickory	G5	S5				6	3
Chenopodium album	Lamb's Quarters	G5	SE5				0	1
Chrysanthemum leucanthemum	Ox-eye Daisy	G?	SE5				0	5
Cichorium intybus	Chicory	GNR	SNA				0	5
Circaea canadensis	Canada Enchanter's Nightshade	G5	S5				3	3
Cirsium arvense	Canada Thistle	GNR	SNA				0	3
Cirsium vulgare	Bull Thistle	G5	SE5				0	4
Comandra umbellata ssp. umbellata	Bastard Toadflax	G5T5	S5				6	3
Convolvulus arvensis	Field Bindweed	GNR	SNA				0	5
Cornus racemosa	Grey Dogwood	G5	S5				2	-2
Cornus sericea	Red-osier Dogwood	G5	S5				2	-3
Crataegus calpodendron	Pear Hawthorn	G--T5	S4			h	4	5
Crataegus coccinea var. coccinea	Scarlet Hawthorn	G3	S4			H	4	5
Crataegus cognata	Cognate Hawthorn	GNR	S4S5				4	5
Crataegus macrosperma	Big-fruited Hawthorn	G5	S5				4	5
Crataegus macracantha	Long-spined Hawthorn	G5	S5				4	5
Crataegus mollis	Downy Hawthorn	G5	S5			u	4	-2
Crataegus pruinosa var. rugosa	Broad-leaved Frosted Hawthorn	G5TNR	S4?			h	4	5
Crataegus punctata	Dotted Hawthorn	G5	S5				4	5
Crataegus sp	Hawthorn Species	-	-				-	-
Dactylis glomerata	Orchard Grass	GNR	SNA				0	3
Daucus carota	Wild Carrot	G?	SE5				0	5
Dianthus armeria	Deptford Pink	GNR	SNA				0	5
Dichanthelium implicatum	Mat Panicgrass	G5T5	S5				3	0
Digitaria sanguinalis	Large Crabgrass	G5	SE5				0	3
Dipsacus fullonum	Common Teasel	GNR	SNA				0	5
Dipsacus fullonum ssp. sylvestris	Common Teasel	G?	SE5				0	5
Echinochloa sp	Barnyard Grass Species	-	-				-	-
Elaeagnus angustifolia	Russian Olive	G?	SE3				0	4
Eleocharis obtusa	Blunt Spikerush	G5	S5				5	-5
Elymus repens	Creeping Wildrye	GNR	SNA				0	3
Epilobium parviflorum	Small-flowered Willow- herb	G?	SE4				0	3
Epilobium sp	Willow-herb Species	-	-				-	-
Erigeron annuus	Annual Fleabane	G5	S5				0	1
Erigeron philadelphicus var. philadelphicus	Philadelphia Fleabane	G5	S5				1	-3
Eutrochium maculatum	Spotted Joe-pye-weed	G5	S5				3	-5
Euthamia graminifolia	Grass-leaved Goldenrod	G5	S5				2	-2
Eutrochium maculatum	Spotted Joe-pye-weed	G5	S5				3	-5
Festuca rubra	Red Fescue	G5	S5				0	1
Festuca sp	Fescue Species	-	-				-	-
Fragaria vesca	Woodland Strawberry	G5	S5				4	4

Scientific Name	Common Name	G Rank	S Rank	COSEWIC	COSSARO	Lrank	CoeCons	CoeWet
Fragaria virginiana	Wild Strawberry	G5	S5				2	1
Fraxinus americana	White Ash	G5	S4				4	3
Fraxinus nigra	Black Ash	G5	S5				7	-4
Fraxinus pennsylvanica	Green Ash	G5	S4				3	-3
Fraxinus sp	Ash Species	-	-				-	-
Galium aparine	Cleavers	G5	S5				4	3
Galium sp	Bedstraw Species	-	-				-	-
Geranium maculatum	Spotted Crane's-bill	G5	S5				6	3
Geum aleppicum	Yellow Avens	G5	S5				2	-1
Geum canadense	White Avens	G5	S5				3	0
Geum laciniatum	Rough Avens	G5	S4				4	-3
Geum sp	Avens Species	-	-				-	-
Geum urbanum	Wood Avens	G5	SNA				0	5
Glechoma hederacea	Ground Ivy	GNR	SNA				0	3
Glyceria striata	Fowl Manna Grass	G5	S5				3	-5
Hemerocallis fulva	Tawny Day-lily	G?	SE5				0	5
Hesperis matronalis	Dame's Rocket	G4G5	SNA				0	5
Hieracium sp	Hawkweed Species	-	-				-	-
Hypericum perforatum	Common St. John's-wort	GNR	SNA				0	5
Hypericum punctatum	Spotted St. John's-wort	G5	S5				5	-1
Impatiens capensis	Spotted Jewelweed	G5	S5				4	-3
Juglans nigra	Black Walnut	G5	S4?				5	3
Jugland regia	English Walnut	GNR	SNA				0	5
Juncus dudleyi	Dudley's Rush	G5	S5				1	0
Juncus effusus	Soft Rush	G5	S5				4	-5
Juncus sp	Rush Species	-	-				-	-
Juncus tenuis	Path Rush	G5	S5				0	0
Juniperus virginiana	Eastern Red Cedar	G5	S5				4	3
Lactuca sp	Lettuce Species	-	-				-	-
Lathyrus tuberosus	Tuberous Vetchling	GNR	SNA				0	5
Leersia oryzoides	Rice Cut Grass	G5	S5				3	-5
Lepidium campestre	Field Peppergrass	GNR	SNA				0	5
Lepidium sp	Pepper-grass Species	-	-				-	-
Leucanthemum vulgare	Oxeye Daisy	GNR	SNA				0	5
Ligustrum vulgare	European Privet	GNR	SNA				0	1
Linaria vulgaris	Butter-and-eggs	G?	SE5				0	5
Lonicera morrowii	Morrow's Honeysuckle	G?	SE3				0	5
Lonicera tatarica	Tartarian Honeysuckle	GNR	SNA				0	3
Lonicera X bella	Showy Fly Honeysuckle	G?	SE2					3
Lotus corniculatus	Bird's-foot Trefoil	G?	-				0	1
Lycopus uniflorus	Northern Water- horehound	G5	S5				5	-5
Lysimachia nummularia	Moneywort	G?	SE5				0	-4
Lythrum salicaria	Purple Loosestrife	G5	SNA				0	-5
Malus coronaria	Wild Crabapple	G5	S4				5	5
Malus pumila	Common Apple	G5	SNA				0	5
Malus sp	Apple Species	-	-				-	-

Scientific Name	Common Name	G Rank	S Rank	COSEWIC	COSSARO	Lrank	CoeCons	CoeWet
Matricaria chamomilla	German Mayweed	GNR	SNA				0	5
Medicago lupulina	Black Medic	GNR	SNA				0	1
Melilotus alba	White Sweet-clover	G5	SE5				0	3
Morus alba	White Mulberry	GNR	SNA				0	0
Nepeta cataria	Catnip	GNR	SNA				0	1
Oenothera biennis	Common Evening- primrose	G5	S5				0	3
Ostrya virginiana	Hop Hornbeam	G5	S5				4	4
Oxalis sp	Wood-sorrel Species	-	-				-	-
Oxalis stricta	Upright Yellow Wood- sorrel	G5	S5				0	3
Panicum dichotomiflorum ssp. dichotomiflorum	Fall Panicgrass	G5T5	SNA				0	-2
Parthenocissus quinquefolia	Thicket Creeper	G5	S4?				6	3
Parthenocissus vitacea	Thicket Creeper	G5	S5				3	3
Persicaria maculosa	Spotted Lady's-thumb	G3G5	SNA				0	-3
Phalaris arundinacea	Reed Canary Grass	G5	S5				0	-4
Phleum pratense	Common Timothy	GNR	SNA				0	3
Phragmites australis ssp. australis	European Reed	G5T5	SNA				3	-5
Picea abies	Norway Spruce	G?	SE3				0	5
Picea pungens	Blue Spruce	G?	SE?					3
Pilosella flagellaris	Whiplash Hawkweed	GNA	SNA				2	1
Pinus nigra	Black Pine	GNR	SNA				0	-5
Pinus strobus	Eastern White Pine	G5	S5				4	3
Pinus sylvestris	Scots Pine	G?	SE5				0	5
Pisum sativum	Garden Pea	G?	SE?				0	5
Plantago lanceolata	Ribgrass	G5	SE5				0	0
Plantago major	Common Plantain	G5	SE5				0	-1
Plantago rugelii	Pale Plantain	G5	S5				1	0
Poa nemoralis	Woods Bluegrass	G5	SNA				0	0
Poa palustris	Fowl Bluegrass	G5	S5				5	-4
Poa pratensis ssp. pratensis	Kentucky Blue Grass	G?	S5				0	1
Poa sp	Blue Grass Species	-	-				-	-
Polygonatum pubescens	Hairy Solomon's Seal	G5	S5				5	5
Polygonum persicaria	Lady's Thumb	G?	SE5				0	-3
Populus balsamifera	Balsam Poplar	G5	S5				4	-3
Populus deltoides ssp. deltoides	Eastern Cottonwood	G5	S5				4	-1
Populus grandidentata	Large-toothed Aspen	G5	S5				5	3
Populus tremuloides	Trembling Aspen	G5	S5				2	0
Potentilla norvegica	Rough Cinquefoil	G5	S5				0	0
Potentilla recta	Sulphur Cinquefoil	GNR	SNA				0	5
Potentilla simplex	Old-field Cinquefoil	G5	S5				3	4
Prunella vulgaris ssp. lanceolata	Heal-all	G5	S5				5	5
Prunus avium	Sweet Cherry	GNR	SNA				0	5
Prunus cerasifera	Cherry Plum	GNR	SNA				0	5
Prunus serotina	Black Cherry	G5	S5				3	3
Prunus virginiana ssp. virginiana	Choke Cherry	G5	S5				2	1
Pyrus communis	Common Pear	G5	SE4				0	5
Quercus alba	White Oak	G5	S5				6	3

Scientific Name	Common Name	G Rank	S Rank	COSEWIC	COSSARO	Lrank	CoeCons	CoeWet
Quercus bicolor	Swamp White Oak	G5	S4				8	-4
Quercus macrocarpa	Bur Oak	G5	S5				5	1
Quercus palustris	Pin Oak	G5	S4				9	-3
Quercus rubra	Northern Red Oak	G5	S5				6	3
Quercus x schuettei	Schuette's Oak	GNA	SNA				-	-
Ranunculus acris	Tall Buttercup	G5	SNA				0	-2
Ranunculus sceleratus	Cursed Buttercup	G5	S5				2	-5
Rhamnus cathartica	Common Buckthorn	GNR	SNA				0	3
Rhus radicans ssp. negundo	Climbing Poison-ivy	G5	S5				5	-1
Rhus typhina	Staghorn Sumac	G5	S5				1	5
Ribes americanum	Wild Black Currant	G5	S5				4	-3
Robinia pseudo-acacia	Black Locust	G5	SE5				0	4
Rosa canina	Dog Rose	GNR	SNA				0	5
Rosa carolina	Carolina Roe	G5	S5				6	3
Rosa multiflora	Multiflora Rose	GNR	SNA				0	3
Rosa sp	Rose Species	<Null>	<Null>				-	-
Rubus allegheniensis	Allegheny Blackberry	G5	S5				2	2
Rubus flagellaris	Northern Dewberry	G5	S4			h	4	4
Rubus hispidus	Swamp Dewberry	G5	S4S5				6	-3
Rubus idaeus subsp. strigosus	Wild Red Raspberry	G5	S5				2	3
Rubus occidentalis	Black Raspberry	G5	S5				2	5
Rudbeckia hirta	Black-eyed Susan	G5	S5				0	3
Rumex crispus	Curly Dock	GNR	SNA				0	-1
Salix alba	White Willow	G5	SE4				0	-3
Salix amygdaloides	Peach-leaved Willow	G5	S5				6	-3
Salix bebbiana	Bebb's Willow	G5	S5				4	-4
Salix discolor	Pussy Willow	G5	S5				3	-3
Salix sp	Willow Species	-	-				-	-
Salix x fragilis	(Salix alba X Salix euxina)	GNA	SNA				0	-4
Salix X rubens	Hybrid White Willow	G?	SE4				0	-4
Sambucus canadensis	Common Elderberry	G5	S5				5	-2
Schoenoplectus tabernaemontani	Soft-stemmed Bulrush	G5	S5				5	-5
Scirpus atrovirens	Dark-green Bulrush	G5?	S5				3	-5
Scirpus cyperinus	Wool Grass	G5	S5				4	-5
Scirpus sp	Bulrush Species	-	-				-	-
Scorzoneroides autumnalis	Fall Hawkbit	G?	SE5				-	3
Setaria pumila	Yellow Foxtail	G?	SE5				0	0
Solanum dulcamara	Climbing Nightshade	GNR	SNA				0	0
Solanum sp	Nightshade Species	-	-				-	-
Solidago altissima var. altissima	Tall Goldenrod	G?	S5				1	3
Solidago canadensis var. canadensis	Canada Goldenrod	G5	S5				1	3
Solidago gigantea	Giant Goldenrod	G5	S5				4	-3
Solidago juncea	Early Goldenrod	G5	S5				3	5
Solidago nemoralis ssp. nemoralis	Gray Goldenrod	G5	S5				2	5
Solidago rugosa ssp. rugosa	Rough Goldenrod	G5	S5				4	0
Sonchus asper ssp. asper	Spiny-leaved Sow-thistle	G?	SE5				-	3

Scientific Name	Common Name	G Rank	S Rank	COSEWIC	COSSARO	Lrank	CoeCons	CoeWet
Symphyotrichum ericoides	White Heath Aster	G5	S5				4	4
Symphyotrichum ericoides var. ericoides	Heath Aster	G5	S5				4	4
Symphyotrichum lanceolatum var. lanceolatum	Panicled Aster	G5	S5				3	-3
Symphyotrichum lateriflorum var. lateriflorum	One-sided Aster	G5	S5				3	-2
Symphyotrichum novae-angliae	New England Aster	G5	S5				2	-3
Symphyotrichum pilosum var. pilosum	Hairy Aster	G5	S5				4	2
Symphyotrichum X amethystinum	Amethyst Aster	GNA	SNA				0	0
Syringa vulgaris	Common Lilac	GNR	SNA				0	5
Taraxacum officinale	Common Dandelion	G5	SNA				0	3
Taxus sp	Yew species	G5	S5				-	-
Thlaspi arvense	Field Penny-cress	GNR	SNA				0	5
Thuja occidentalis	Eastern White Cedar	G5	S5				4	-3
Tilia americana	Basswood	G5	S5				4	3
Toxicodendron radicans var. radicans	Climbing Poison-ivy	G5	S5				5	-1
Tragopogon porrifolius	Purple Goat's-beard	GNR	SNA				0	5
Trifolium pratense	Red Clover	G?	SE5				0	2
Trifolium repens	White Clover	G?	SE5				0	2
Tussilago farfara	Coltsfoot	G?	SE5				0	3
Typha angustifolia	Narrow-leaved Cattail	G5	S5				-	-5
Typha latifolia	Broad-leaved Cattail	G5	S5				1	-5
Ulmus americana	American Elm	G5	S5				3	-2
Ulmus pumila	Siberian Elm	GNR	SNA				0	5
Ulmus sp	Elm Species	-	-				-	-
Valeriana officinalis	Common Valerian	GNR	SNA				0	0
Verbascum thapsus	Common Mullein	G?	SE5				0	5
Verbena hastata	Blue Vervain	G5	S5				4	-4
Verbena urticifolia	White Vervain	G5	S5				4	-1
Veronica officinalis	Common Speedwell	G5	SNA				0	5
Viburnum cassinoides	Wild Raisin	G5	S5				7	-3
Viburnum lentago	Nannyberry	G5	S5				4	-1
Viburnum opulus	European Highbush Cranberry	G5	SE4				0	0
Vicia cracca	Tufted Vetch	GNR	SNA				0	5
Vicia tetrasperma	Four-seeded Vetch	GNR	SNA				0	5
Vitis labrusca	Fox Grape "Concord"	G5	S1				3	3
Vitis riparia	Riverbank Grape	G5	S5				0	-2
Vitis sp	Grape Species	-	-				-	-
Xanthium strumarium	Rough Cocklebur	G5	S5				2	0

Legend

CoeCons. - Coefficient of Conservatism. Scores for each species range from 0 (low conservatism) to 10 (high conservatism). A conservatism value of 0 indicates species is widespread. A value of 8, 9 or 10 indicates that a species is a habitat specialist.

CoeWet. - Coefficient of Wetness
5 - Almost always occur in upland areas
4, 3, 2 - Usually occur in upland areas
1, 0, -1 - Found equally in upland and wetland areas
-2, -3, -4 Usually occur in wetlands
-5 Almost always occur in wetlands

Grank - Global Rank G1 — Critically Imperiled, G2 — Imperiled, G3 — Vulnerable, G4 — Apparently Secure, G5 — Secure

COSEWIC - Committee on the Status of Endangered Wildlife in Canada

COSSARO - Committee on the Status of Species at Risk in Ontario

Srank - Subnational Rank
S1 — Critically Imperiled - Critically imperiled in the province because of extreme rarity, (often 5 or fewer occurrences)
S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer)
S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer)
S4 — Apparently Secure - Uncommon but not rare
S5 — Secure - Common, widespread, and abundant in the province
SE — Exotic

Lrank - Local Rank
U - Uncommon in the City of Hamilton

Appendix B

Site Photographs

Photo 1. Example of vegetation conditions in the CUM1-1/Cultivated Area on the Subject Lands.

Photo 2. Example of vegetation conditions in the CUM1-1/Cultivated Area on the Subject Lands.

Photo 3. Example of vegetation conditions in the CUM1-1 community on the Subject Lands.

Photo 4. Example of vegetation conditions in the THDM2-6 community on the 192 Fruitland Road Property.

Photo 5. Example of vegetation conditions in the THDM2-6 community on the 192 Fruitland Road Property.

Photo 6. Example of vegetation conditions within and adjacent to Watercourse 5 on the 212 Fruitland Road property.

Photo 7. Example of vegetation conditions within and adjacent to Watercourse 5 on the 236 Fruitland Road property.

Photo 8. Example of conditions within and adjacent to Watercourse 5 on the 258 Fruitland Road property.

Photo 9. Example of vegetation conditions in the THDM2-6 community on the 258 Fruitland Road property.

Photo 10. Example of vegetation conditions in the THDM2-6/WODM4-4 community on the 258 Fruitland Road property.

Photo 11. Example of vegetation conditions in the CUP3 community on the 258 Fruitland Road property.

Photo 12. Example of vegetation conditions in the FOD9 community north of the 258 Fruitland Road property.

Appendix C

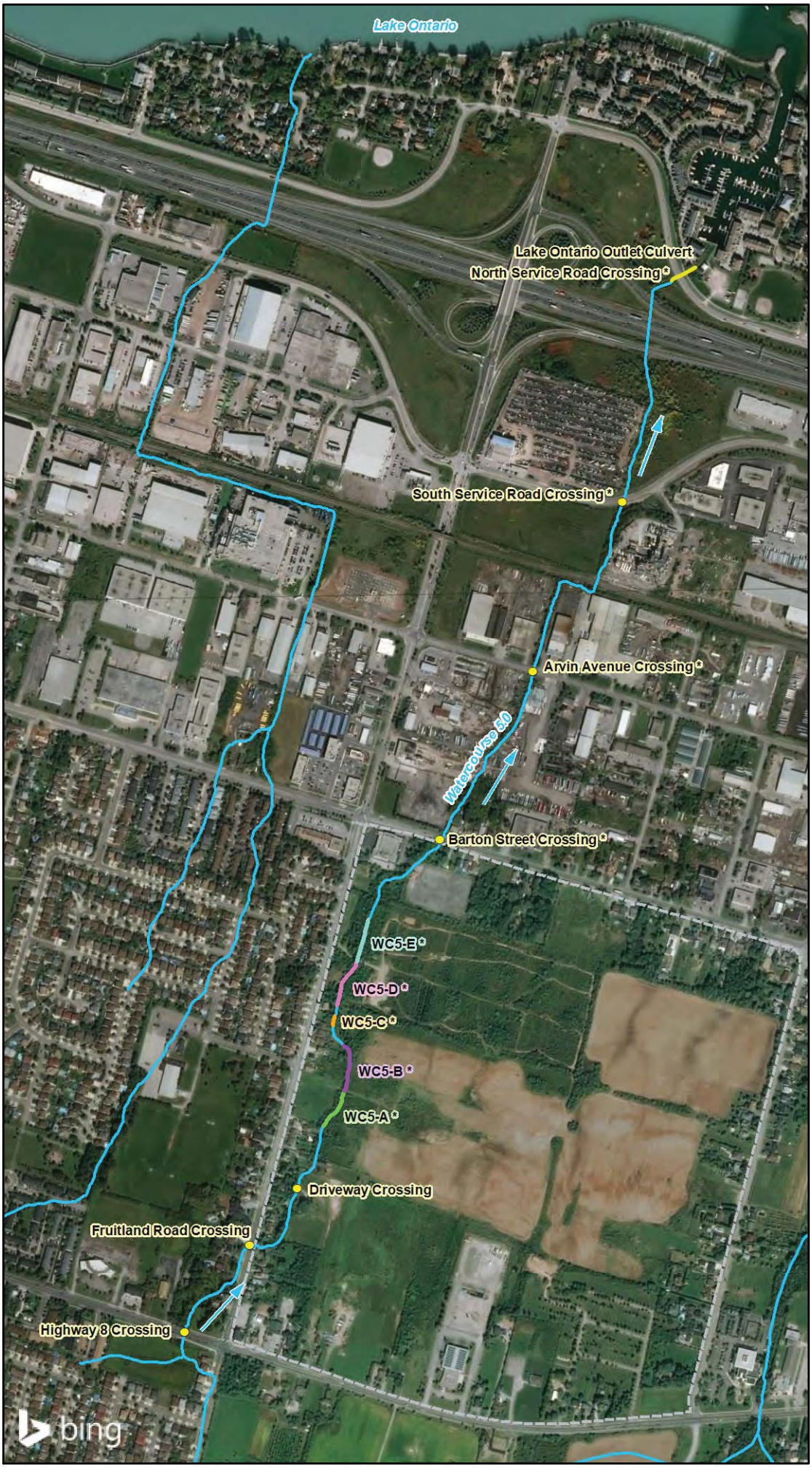
Breeding Bird Survey Results

Common Name	Scientific Name	COSEWIC	COSSARO	S Rank	2015	2018	2019	2021	2023
American Crow	*Corvus brachyrhynchos*	---	---	S5B	X	X	X	X	X
American Goldfinch	*Spinus tristis*	---	---	S5B	X	X	X	X	X
American Robin	*Turdus migratorius*	---	---	S5B	X	X	X	X	X
American Woodcock	*Scolopax minor*	---	---	S4B			X	X	
Baltimore Oriole	*Icterus galbula*	---	---	S4B	X	X	X	X	X
Barn Swallow	*Hirundo rustica*	SC	SC	S4B	X	X	X	X	X
Black-capped Chickadee	*Poecile atricapillus*	---	---	S5	X	X	X	X	X
Blue Jay	*Cyanocitta cristata*	---	---	S5					X
Bobolink	*common - ubiquitous*	THR	THR	S4	X	X			
Brown Thrasher	*Toxostoma rufum*	---	---	S4B	X			X	
Brown-headed Cowbird	*Molothrus ater*	---	---	S4B	X	X	X	X	X
Canada Goose	*Branta canadensis*	---	---	S5		X	X	X	
Caspian Tern	*Hydroprogne caspia*	---	---	S3				X	
Cedar Waxwing	*Bombycilla cedrorum*	---	---	S5B	X	X	X	X	X
Chimney Swift	*Chaetura pelagica*	THR	THR	S3	X		X	X	X
Chipping Sparrow	*Spizella passerina*	---	---	S5B	X		X	X	
Common Grackle	*Quiscalus quiscula*	---	---	S5B	X	X	X	X	X
Common Yellowthroat	*Geothlypis trichas*	---	---	S5B	X	X	X	X	X
Dark-eyed Junco	*Junco hyemalis*	---	---	S5	X				
Double Crested Cormorant	*Nannopterum auritum*	---	---	S5	X			X	
Downy Woodpecker	*Dryobates pubescens*	---	---	S5	X	X	X	X	X
Eastern Meadowlark	*Sturnella magna*	THR	THR	S4	X				
Eastern Kingbird	*Tyrannus tyrannus*	---	---	S4B	X	X	X	X	X
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S4B				X	X
European Starling	*Sturnus vulgaris*	---	---	SNA	X	X	X	X	X
Field Sparrow	*Spizella pusilla*	---	---	S4B	X	X		X	X
Grasshopper Sparrow	*Ammodramus savannarum*	SC	SC	S4		X			
Gray Catbird	*Dumetella carolinensis*	---	---	S4B	X	X	X	X	X
Great Blue Heron	*Ardea herodias*	---	---	S4	X			X	X
Great Crested Flycatcher	*Myiarchus crinitus*	---	---	S4B	X		X	X	
Green Heron	*Butorides virescens*	---	---	S4B	X		X	X	
Horned Lark	*Eremophila alpestris*	---	---	S5B			X	X	
House Finch	*Haemorhous mexicanus*	---	---	SNA	X	X	X	X	X
House Sparrow	*Passer domesticus*	---	---	SNA	X	X	X	X	X
House Wren	*Troglodytes aedon*	---	---	S5	X	X	X		X
Indigo Bunting	*Passerina cyanea*			S4	X		X		X
Killdeer	*Charadrius vociferus*	---	---	S5B,S5 N	X	X	X	X	X
Mallard	*Anas platyrhynchos*	---	---	S5	X	X			X
Mourning Dove	*Zenaida macroura*	---	---	S5	X	X	X	X	X
Northern Cardinal	*Cardinalis cardinalis*	---	---	S5	X	X	X	X	X
Northern Flicker	*Colaptes auratus*	---	---	S4	X	X	X		X
Northern Mockingbird	*Mimus polyglottos*	---	---	S4		X			
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	---	---	S4	X	X	X		
Palm Warber	*Setophaga palmarum*	---	---	S5	X				
Purple Martin	*Progne subis*	---	---	S4B					X
Red-bellied Woodpecker	*Melanerpes carolinus*	---	---	S4	X				
Red-eyed Vireo	*Vireo olivaceus*	---	---	S5	X		X		X
Red-tailed Hawk	*Buteo jamaicensis*	---	---	S5	X			X	
Red-winged Blackbird	*Agelaius phoeniceus*	---	---	S4	X	X	X	X	X
Ring-billed Gull	*Larus delawarensis*	---	---	S5	X	X	X	X	X
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	---	---	S4	X				
Rock Pigeon	*Columba livia*	---	---	SNA		X		X	
Savannah Sparrow	*Passerculus sandwichensis*	---	---	S4B	X	X	X	X	X
Song Sparrow	*Melospiza melodia*	---	---	S5B	X	X	X	X	X
Spotted Sandpiper	*Actitis macularius*	---	---	S5	X		X		X
Swamp Sparrow	*Melospiza georgiana*	---	---	S5B		X			X
Tree Swallow	*Tachycineta bicolor*	---	---	S4		X	X		X
Turkey Vulture	*Cathartes aura*	---	---	S5		X			
Vesper Sparrow	*Pooecetes gramineus*	---	---	S4			X		
Warbling Vireo	*Vireo gilvus*	---	---	S5B	X		X	X	
Willow Flycatcher	*Empidonax traillii*	---	---	S5B	X	X	X	X	X
Wilson's Snipe	*Gallinago delicata*	---	---	S5B				X	
Winter Wren	*Troglodytes hiemalis*	---	---	S4				X	
Yellow-rumped Warbler	*Setophaga coronata*	---	---	S5	X	X			
Yellow Warbler	*Setophaga petechia*	---	---	S5B	X	X	X	X	X

Appendix D

Aquatic Resource Findings:

Figure and Photographs



Legend

- Fruitland BSS Study Area
- Roadside Visual Aquatic Habitat Survey
- Aquatic Habitat Surveyed in Channel (WC5-A to -E and near Lake Ontario Outlet)
- Flow Direction

* Fish Survey Conducted

0 100 200 400

Metres

Imagery Credits: © 2021 Microsoft Corporation © 2021 Maxar ©CNES (2021) Distribution Airbus DS

Fruitland - Winona Block 1
Environmental Impact Statement

Watercourse 5.0
Aquatic Assessment Locations

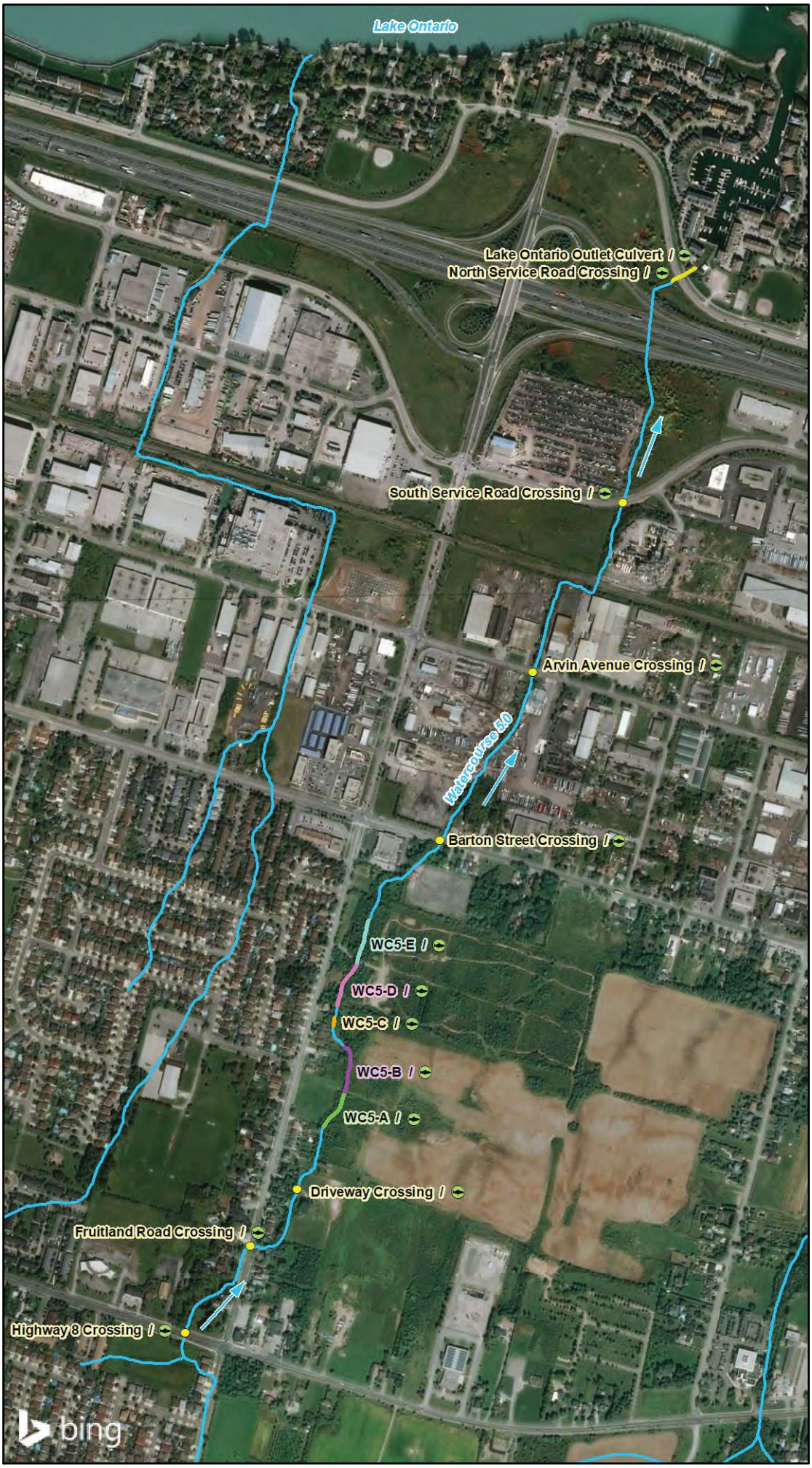
PROJECT:	
CLIENT:	
DATE:	November 2021
SCALE:	1:10,500
DRAWN BY:	TR
CHECKED BY:	RD

UTM Zone 17 NAD83

FIGURE:

W-1

S:\Gis\Projects\TP\115082_Fruitland\ArcGIS\Fig W-1 Assessment Locations.mxd ANALYST: trevor.robertson 21-11-30 11:36:17 AM



Legend

- Fruitland BSS Study Area
- Roadside Visual Aquatic Habitat Survey
- Aquatic Habitat Surveyed in Channel (WC5-A to -E and near Lake Ontario Outlet)
- Flow Direction
- / Potential Fish Barrier(s) Observed
- Indirect Fish Habitat

0 100 200 400
Metres

Fruitland - Winona Block 1
Environmental Impact Statement

Existing Aquatic Habitat Conditions

PROJECT:
CLIENT:

UTM Zone 17 NAD83

DATE:	November 2021
SCALE:	1:10,500
DRAWN BY:	TR
CHECKED BY:	RD

FIGURE:

W-2

S:\Gis\Projects\TP\115082_Fruitland\ArcGIS\Fig W-2 Habitat Conditions.mxd ANALYST: trevor.robertson 21-11-30 11:52:12 AM

Appendix A **Representative Photographs**

Project Photos

Project Photo	Description
	Photo 1: 5 July 2021. Facing upstream of Highway 8 culvert inlet. Stormwater outlet culverts and outlet/inlet channel bordered by gabion baskets. Upstream extent of a discernable watercourse channel.
	Photo 2: 5 July 2021. Upstream of Highway 8 box culvert with view of structure inlet and gabion bank reinforcement (facing downstream).
	Photo 3: 5 July 2021. Shallow water (3 mm deep) within Highway 8 culvert characteristic of limited aquatic habitat.

Photo 4: 5 July 2021. Highway 8 concrete box culvert outlet channel (facing upstream).

Photo 5: 5 July 2021. Shallow water (3 cm deep) in the Highway 8 box culvert outlet channel.

Photo 6: 17 June 2021. Watercourse 5.0 upstream view, west of Fruitland Road, in remnant section of roadside channel that appears naturalized with vegetation. Dense vegetation combined obscures the channel.

Photo 7: 17 June 2021. Fruitland Road box culvert inlet channel. Upstream view, west side of Fruitland Road, with twin CSP culverts of residential driveway crossing in background.

Photo 8: 17 June 2021. Fruitland Road culvert outlet. Standing water conditions (1 mm deep and with no observable flow).

Photo 9: 17 June 2021. Upstream (south) of 212 Fruitland Road culvert inlet. Shallow water (approximately 1 to 2 mm) within the channel. Intermittently distributed dry sections of channel were present.

	Photo 10: 5 July 2021. Isolated pool immediately upstream (south) of 212 Fruitland Road culvert inlet. Standing water conditions with no observable flow.
	Photo 11: 17 June 2021. Inlet of 212 Fruitland Road culvert. Cobble and wood may provide a barrier to fish movement in event of any higher flows.
	Photo 12: 17 June 2021. Outlet of 212 Fruitland Road culvert. Shallow water (1 to 2 mm) within the culvert.

	Photo 13: 5 July 2021. Downstream of 212 Fruitland Road culvert outlet. Dense overhanging riparian vegetation. Shallow standing water observed within the channel.
	Photo 14: 17 June 2021. Upstream (south) view of watercourse section WC5-A. Pool morphology with a maximum depth of 0.45 m. Outlet of metal culvert at inaccessible private property.
	Photo 15: 17 June 2021. Watercourse Section WC5-A. Shallow water (1 mm) and fallen pedestrian bridge with debris blocking channel and aquatic corridor function.

	Photo 16: 17 June 2021. Watercourse Section WC5-A. Dry area in channel surrounded by shallow (<2 cm) standing water. Substrates consisting of fines, cobble and assorted debris.
	Photo 17: 15 July 2021. Watercourse Section WC5-A. Standing water area of aquatic habitat with no observable flow within the channel. Fine substrates.
	Photo 18: 15 July 2021. Watercourse Section WC5-A, near downstream end of the reach. More defined channel with undercutting on right (west) bank and shallow pool habitat. Riparian vegetation is present along the channel providing overhead shading and cover.

	Photo 19: 17 June 2021. Culvert inlet under grass access path between Watercourse sections WC5-A and WC5-B. Water 1 mm deep within the 4.5 m long culvert.
	Photo 20: 17 June 2021. Culvert outlet under grass access path between Watercourse sections WC5-A and WC5-B. Debris at culvert outlet extends 55 cm above channel invert partially blocking the flow path. No discernable flow was observed.
	Photo 21: 15 July 2021. Watercourse Section WC5-B exhibiting characteristic intermittent shallow water area with aquatic algae coating a substrate of fines and cobbles. No flow was observed.

		Photo 22: 15 July 2021. Watercourse Section WC5-B exhibiting a shallow standing water pool habitat area.
		Photo 23: 17 June 2021. Shallow water (≤1 mm) interspersed with dry segments within Watercourse Section WC5-B.
		Photo 24: 17 June 2021. Limited shallow standing water aquatic habitat within Watercourse Section WC5-B. No observable flow.

	Photo 25: 17 June 2021. Downstream end of Watercourse Station WC5-B, facing north toward inaccessible properties. Channel was narrow and most of the riparian vegetation maintained as lawn. Limited pool of standing water with notable growth of aquatic algae.
	Photo 26: 15 July 2021. Facing upstream from Watercourse Section WC5-C where the defined channel runs through residential properties. Areas beyond this view were not accessed due to private properties. Standing water in scour pool providing some aquatic habitat opportunities.
	Photo 27: 15 July 2021. Watercourse Section WC5-C upstream view showing mowed lawns, trimmed riparian vegetation leading to unmaintained riparian vegetation on banks of a scour pool providing aquatic habitat opportunities.

	Photo 28: 15 July 2021. Left (east) bank with exposed soil in Watercourse Section WC5-C showing exposed bank materials and partially vegetated riparian area adjacent to standing water pool.
	Photo 29: 15 July 2021. Watercourse Section WC5-C, downstream view. Defined channel runs through residential properties immediately downstream (north) which were not accessible.
	Photo 30: 15 July 2021. Upstream view of Watercourse Section WC5-D. Channel runs through residential properties immediately upstream which were not accessible. Mowed grasses, walkway over the watercourse and placed boulder and stone all observed within this reach of standing water pool habitat.

	Photo 31: 15 July 2021. Watercourse Section WC5-D. Shallow water pool area and exposed banks and dry channel bed at pool outlet.
	Photo 32: 15 July 2021. Representative overview, facing upstream within Watercourse Section WC5-D. Signs of erosion and undercutting in a reach with dense riparian shrub growth.
	Photo 33: 15 July 2021. Watercourse Section WC5-D. Potential impediment to fish movement – 0.45 m to 0.55 m vertical elevation change above 0.39 m deep pool, recorded in June and July. The channel is dry for approximately 0.7 m upstream of the elevation change. Stepped pool configuration of channel profile.

	Photo 34: 15 July 2021. Representative overview of Watercourse Section WC5-D. No flow was observed within the channel. Note densely vegetated riparian area and exposed banks.
	Photo 35: 17 June 2021. Aquatic habitat within Watercourse Section WC5-D. Dense riparian shrub and tree vegetation, standing water pool characterized by a thick growth of aquatic algae across the channel width and length suggesting nutrient inputs.
	Photo 36: 17 June 2021. Downstream view of Watercourse Section WC5-D toward gravel/dirt path bridge. Dry channel, 0.2 m elevation change over 2 m length. Water present under the bridge. Photos 37 and 38 also show this area.

	Photo 37: 17 June 2021. Downstream end of Watercourse Section WC5-D. Facing upstream toward tree root growth across the channel and dry section of channel immediately downstream. Potential impediment to upstream fish movement due to approximately 0.4 m vertical elevation change recorded in June and July.
	Photo 38: 15 July 2021. Watercourse Section WC5-D. Facing upstream toward the tree root across the channel (shown in Photo 37) and short dry section of channel upstream of root.
	Photo 39: 15 July 2021. Dirt/gravel path over Watercourse 5.0, separating Sections WC5-D and WC5-E.

		Photo 40: 17 June 2021. Watercourse Section WC5-E. Approximately 10 m downstream of crossing structure (see photo 41 for July conditions). Dense riparian vegetation, standing water aquatic habitat and woody debris cover in the channel.
		Photo 41: 15 July 2021. Watercourse Section WC5-E. Approximately 10 m downstream of crossing structure.
		Photo 42: 15 July 2021. Watercourse Section WC5-E. Standing water with dense aquatic algae present in long pool habitat area. Notable riparian vegetation cover.

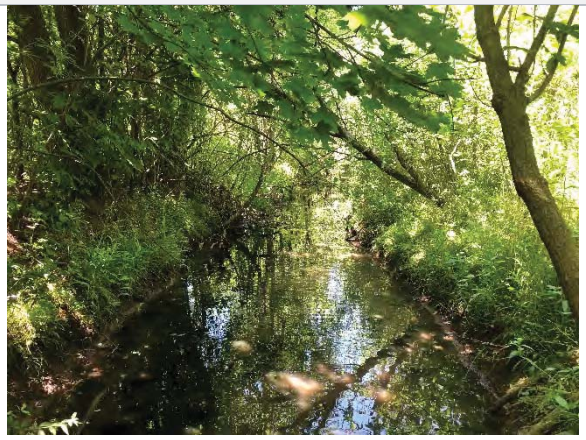
	Photo 43: 17 June 2021. Standing water pool habitat within Watercourse Section WC5-E. Aquatic algae present within channel, with no observable flow.
	Photo 44: 17 June 2021. Riparian vegetated bank with some exposed soil in Watercourse Section WC5-E. Deeper pool habitat throughout this apparent previously channelized reach.
	Photo 45: 17 June 2021. Aquatic habitat near downstream end of Watercourse Section WC5-E. Straightened channel reach with standing water pool habitat with notable growths of algae, dense riparian vegetation and overhead shade.

	Photo 46: 5 July 2021. Shallow-water reach upstream of Barton Street inlet channel with cobble substrates. Water level was very shallow with no discernable flow.
	Photo 47: 17 June 2021. Barton Street CSP culvert component inlet. Shallow ponded area of water immediately upstream of culvert inlet (facing downstream).
	Photo 48: 17 June 2021. View facing upstream through Barton Street concrete box culvert component. Area within the approximately 23 m long culvert was mostly lined with cobble substrates and exhibited dry conditions with no flow.

	Photo 49: 17 June 2021. Barton Street culvert outlet. Shallow standing water downstream of culvert representing limited habitat. See photo 50 for site conditions in July 2021.
	Photo 50: 5 July 2021. Barton Street culvert outlet. Water level slightly higher compared to June due to recent precipitation. Conditions exhibited similar habitat limitations as in June (See photo 49 for site conditions in June 2021).
	Photo 51: 17 June 2021. Barton Street culvert outlet channel downstream view. Dry channel downstream of isolated shallow standing water area in foreground and vertical grade increase in channel floor. Intermittent nature of standing water areas limits function of aquatic corridor (see photo 52 for site conditions in July 2021).

	Photo 52: 15 July 2021. Barton Street culvert outlet channel downstream view. Dry channel downstream of isolated shallow, stagnant water area. Aquatic habitat limitations similar to June observations (See photo 51 for site conditions in June 2021).
	Photo 53: 17 June 2021. Arvin Avenue culvert inlet channel upstream view. Dense vegetation in predominantly dry channel. Very limited aquatic habitat.
	Photo 54: 5 July 2021. Arvin Avenue concrete box culvert inlet area, with view facing downstream within culvert. Predominantly dry channel, limited aquatic habitat represented by standing water area. Impediment to potential fish movement during low flows as observed.

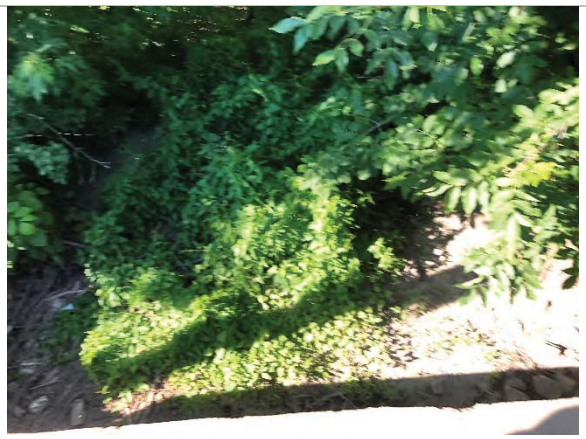
	Photo 55: 17 June 2021. Arvin Avenue culvert outlet. Channel was dry at the time off assessment and choked with terrestrial vegetation, suggesting characteristic seasonally dry conditions as observed.
	Photo 56: 5 July 2021. South Service Road culvert inlet channel. No observable flows. Very limited aquatic habitat in the form of standing water pool area.
	Photo 57: 5 July 2021. South Service Road culvert outlet. Predominantly dry channel with limited aquatic habitat and impediment to potential fish movement under low flow conditions.

		Photo 58: 15 July 2021. Shallow standing water within South Service Road culvert. Shallow water (<1 cm) and dry sections.
		Photo 59: 17 June 2021. South Service Road culvert outlet. Dense cattail and phragmites choking the channel. Shallow water and dense vegetation would impede fish movement. Very minor flows were observed within this section exhibiting first indication of any flow in the watercourse.
		Photo 60: 5 July 2021. South Service Road culvert outlet downstream view. Shallow water and dense vegetation would impede potential fish movement. Very minor flows were evident in this lower watercourse reach.

	Photo 61: 5 July 2021. Representative overview of South Service Road culvert outlet channel area.
	Photo 62: 17 June 2021. Representative overview of North Service Road inlet channel. Dense phragmites in the upstream channel.
	Photo 63: 15 July 2021. Shallow water immediately upstream of North Service Road culvert. Limited aquatic habitat and shallow water levels. Minimal flows were observed in this lower reach of the watercourse.

		Photo 64: 5 July 2021. Shallow (0.1 to 0.5 cm) water within the approximately 37.4 m long North Service Road concrete box culvert. Shallow water and concrete channel represent limited aquatic habitat and would impede potential fish movement during characteristics low flows as observed.
		Photo 65: 5 July 2021. North Service Road box culvert outlet channel. Water depth 2 cm downstream of the culvert outlet, with run habitat embedded cobble substrate.
		Photo 66: 15 July 2021. North Service Road culvert outlet with 2 mm water depths. Limited to no refuge as aquatic habitat.

	Photo 67: 17 June 2021. Facing downstream from North Service Road. Dry channel upstream of culvert which outlets to Lake Ontario creating a notable impediment to upstream fish movement.
	Photo 68: 5 July 2021. Inlet of concrete box culvert structure outletting to Newport Yacht Club and corridor to Lake Ontario. Water level (0 to 1 mm) represents a barrier to fish movement during low flows observed.
	Photo 69: 5 July 2021. Facing downstream into culvert that outlets to Lake Ontario. Opening and associated drop in the culvert floor represents the outlet of Watercourse 5.0 flows to the lake. Outlet drop structure appears to notably impede any upstream fish movement and access from permanent fish habitat in Lake Ontario into the culvert and subsequently Watercourse 5.0.

Appendix E

Species at Risk Screening

HAMILTON

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

AMPHIBIANS		ESA Protection	Key Habitats Used By Species	Subject Lands
Jefferson Salamander (*Ambystoma jeffersonianum*)	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	inhabit deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	Potential breeding and overwintering habitat not present on Subject Lands.
Unisexual Ambystoma - Jefferson dominated (*Ambystoma laterale - jeffersonianum*)	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	inhabit deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	Potential breeding and overwintering habitat not present on Subject Lands.

BIRDS		ESA Protection	Key Habitats Used By Species	Subject Lands
Acadian Flycatcher (*Empidonax virescens*)	**Known to Occur**	*Species and General Habitat Protection*	generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Bank Swallow (*Riparia riparia*)	**Known to Occur**	*Species and General Habitat Protection June 27, 2014*	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Barn Owl (*Tyto alba*)	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	generally prefer low-elevation, open country; often associated with agricultural lands, especially pasture. Nests are located in buildings, hollow trees and cavities in cliffs.	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Barn Swallow (*Hirundo rustica*)	**Known to Occur**	*Species and General Habitat Protection*	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Barn Swallows observed foraging during breeding bird surveys. No nests or nesting behaviour observed near structures on Subject Lands.
Black Tern (*Childonias niger*)	**Known to Occur**	*N/A*	generally prefer freshwater marshes and wetlands; nest either on floating material in a marsh or on the ground very close to water	Potential breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Bobolink (*Dolichonyx oryzivorus*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Bobolink observed foraging within Subject Lands during breeding bird surveys. Current habitat not suitable for breeding.
Canada Warbler (*Cardellina canadensis*; formerly *Wilsonia canadensis*)	**Known to Occur**	*N/A*	Generally prefers wet coniferous, decediuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Cerulean Warbler (*Setophaga cerulea;* formerly *Dendoica cerulea*)	**Known to Occur**	*Species and General Habitat Protection*	generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests.	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Chimney Swift (*Chaetura pelagica*)	**Known to Occur**	*Species and General Habitat Protection*	historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Common Nighthawk (*Chordeiles minor*)	**Known to Occur**	*N/A*	generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Typical breeding habitat not present on Subject Lands.

Eastern Meadowlark (*Sturnella Magna*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Potential breeding habitat present on Subject Lands. Not observed during breeding bird surveys.
Eastern Whip-poor-will *(Caprimlugus vociferus)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas.	Typical breeding habitat not present on Subject Lands.
Eastern Wood-Pewee (*Contopus virens*)	**Known to Occur**	*N/A*	asscoiated with deciduous and mixed forests. Witin mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges.	Potential habitat present on Subject Lands. One individual detected during breeding bird surveys. Use deemed to be incidental.
Golden-winged Warbler (Vermivora chrysoptera)	**Known to Occur**	*N/A*	generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Henslow's Sparrow *(Ammodramus henslowii)*	**Historically Known to Occur**	*Species and General Habitat Protection*	generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
King Rail *(Rallus elegans)*	**Known to Occur**	*Species and General Habitat Protection*	generally this species requires large marshes with open shallow water that merges with shrubby areas	Potential breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Least Bittern *(Ixobrychus exilis)*	**Known to Occur**	*Species and General Habitat Protection*	generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	Potential breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Louisiana Waterthrush *(Seiurus motacilla)*	**Known to Occur**	*N/A*	generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps	Potential breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Peregrine Falcon *(Falco peregrinus)*	**Known to Occur**	*N/A*	generally nest on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated downtown areas.	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Prothonotary Warbler *(Protonotaria citrea)*	**Known to Occur**	*Species and General Habitat Protection*	generally found in the dead trees of flooded woodlands or deciduous swamp forests; Carolinian zone	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Red-Headed Woodpecker *(Melanerpes erythrocephalus)*	**Known to Occur**	*N/A*	generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Short-eared Owl *(Asio flammeus)*	**Suspected to Occur**	*N/A*	generally prefers a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations, old pastures and agricultural fields	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Wood Thrush (Hylocichla mustelina)	**Known to Occur**	*N/A*	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments.	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.
Yellow-breasted Chat *(Icteria virens)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	Typical breeding habitat not present on Subject Lands. Not observed during breeding bird surveys.

FISH			**Key Habitats Used By Species**	**Subject Lands**
American Eel *(Anguilla rostrata)*	**Known to Occur**	*Species and General Habitat Protection*	all fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean; 12-mile creek watershed and Lake Ontario	Potential habitat not present on Subject Lands. Not observed during electrofishing surveys.
Grass Pickerel *(Esox americanus vermiculatus)*	**Known to Occur**	*N/A*	generally occur in wetlands with warm, shallow water and an abundance of aquatic plants; occur in the St. Lawrence River, Lake Ontario, Lake Erie, and Lake Huron	Potential habitat not present on Subject Lands. Not observed during electrofishing surveys.
Northern Sunfish (*Lepomis peltastes*)	**Known to Occur**	*N/A*	Shallow vegetated areas of quiet, slow flowing rivers and streams, as well as warm lakes and ponds, with sandy banks or rocky bottoms.	Potential habitat not present on Subject Lands. Not observed during electrofishing surveys.

Redside Dace *(Clinostomus elongatus)*	**Known to Occur**	*Species Protection and **Habitat Regulation***	generally found in pools and slow-moving areas of small headwater streams with a moderate to high gradien	Potential habitat not present on Subject Lands. Not observed during electrofishing surveys.
Silver Shiner *(Notropis photogenis)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients	Potential habitat not present on Subject Lands. Not observed during electrofishing surveys.

INSECTS		ESA Protection	**Key Habitats Used By Species**	**How to Conduct a Proper Survey**
Monarch Butterfly *(Danaus plexippus)*	**Known to Occur**	*N/A*	exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	No milkweed noted on Subject Lands. Monarchs not observed during field inventories.
Mottled Duskywing (Erynnis martialis)	**Known to Occur**	*Species and General Habitat Protection June 27, 2014*	generally inhabits a range of grassland, shrubland, and savanna habitats that contain well drained soils and the presence of its host plants Prairie Redroot (Ceanothus herbaceus) or New Jersey Tea (Ceanothus americanus).	Typical habitat not present on Subject Lands.
West Virginia White (Pieris virginiensis)	**Known to Occur**	*N/A*	generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Typical habitat not present on Subject Lands.

MAMMALS		ESA Protection	**Key Habitats Used By Species**	**Subject Lands**
American Badger *(Taxidea taxus jacksoni)*	**Known to Occur**	*Species Protection and **Habitat Regulation***	generally prefer open habitats, whether natural (grasslands) or man-made (agricultural fields, road right-of-ways, golf courses)	Typical habitat not present on Subject Lands. Not observed during breeding bird surveys.
Eastern small-footed Myotis (*Myotis leibii*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Potential habitat present in woodlands on the Subject Lands. Potential habitat and use to be assessed as part of further studies.
Little Brown Myotis (*Myotis lucifugus*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Potential habitat present in woodlands on the Subject Lands. Potential habitat and use to be assessed as part of further studies.
Northern Myotis (*Myotis septentrionalis*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Potential habitat present in woodlands on the Subject Lands. Potential habitat and use to be assessed as part of further studies.
Tri-colored Bat (*Perimyotis subflavus*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures.	Potential habitat present in woodlands on the Subject Lands. Potential habitat and use to be assessed as part of further studies.
Woodland Vole *(Microtus pinetorum)*	**Known to Occur**	*N/A*	generally associated with deciduous forests in areas of soft, friable, often sandy soil beneath deep humus, where it can burrow easily.	Typical habitat not present on Subject Lands. Not observed during site visits.

MOLLUSCS		ESA Protection	**Key Habitats Used By Species**	**Subject Lands**
Eastern Pondmussel *(Ligumia nasuta)*	**Known to Occur**	*Species and General Habitat Protection*	generally inhabit sheltered areas of lakes or slow streams in substrates of fine sand and mud	Potential habitat not present on Subject Lands.
Lilliput (*Taxolasma parvum*)	**Known to Occur**	*Species and General Habitat Protection June 27, 2014*	Found in a variety of habitats including small to large rivers, wetlands, shallows of lakes, ponds and reservoirs. They are common in soft substrates with over 50% of the substrate type comprised of sand and a mud/muck/silt combination. Typically occur with or near Green Sunfish, Bluegill, White Crappie, and Johnny Darter	Potential habitat not present on Subject Lands.

Rainbow Mussel *(Villosa iris)*	**Known to Occur**	*Species and General Habitat Protection*	most abundant in shallow, well- oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud	Potential habitat not present on Subject Lands.

MOSSES		ESA Protection	**Key Habitats Used By Species**	**Subject Lands**
Spoon-leaved Moss (*Bryoandersonia illecebra*)	**Known to Occur**	*Species and General Habitat Protection*	generally found in deciduous forests; found on soil that is in or near flat, low-lying, seasonally wet areas.	Typical habitat not present on Subject Lands. Not observed during botanical inventories.

PLANTS		ESA Protection	**Key Habitats Used By Species**	**Subject Lands**
American Chestnut *(Castanea dentata)*	**Known to Occur**	*Species and General Habitat Protection*	found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils.	Potential habitat present on Subject Lands. Not observed during botanical inventories.
American Columbo *(Frasera caroliniensis)*	**Known to Occur**	*Species and General Habitat Protection*	most commonly associated with open deciduous forested slopes, thickets and clearings; grows in a variety of relatively stable habitats as well as on a wide variety of soils	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
American Ginseng *(Panax quinquefolius)*	**Known to Occur**	*Species and General Habitat Protection*	grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
Broad Beech Fern *(Phegopteris hexagonoptera)*	**Known to Occur**	*N/A*	generally inhabits shady areas of beech and maple forests where the soil is moist or wet	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
Butternut *(Juglans cinerea)*	**Known to Occur**	*Species and General Habitat Protection*	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Potential habitat present on Subject Lands. Not observed during botanical inventories.
Cherry Birch (*Betula lenta*)	**Known to Occur**	*Species and General Habitat Protection*	Generally grows in moist, well drained soils, but it is also found on coarse-textured or rocky shallow soils.	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
Eastern Flowering Dogwood *(Cornus florida)*	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; Also grows around edges and hedgerows	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
Few-flowered Club-rush *(Trichophorum planifolium)*	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	generally found in Dry Fresh Oak deciduous forests and Dry Fresh Oak-Maple-Hickory deciduous forests (only found on RBG property)	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
Green Dragon *(Arisaema dracontium)*	**Known to Occur**	*N/A*	generally grows in damp deciduous forests and along streams.	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
Hoary Mountain Mint (*Pycnanthemum incanum*)	**Known to Occur**	*Species and General Habitat Protection*	Oak savannas and prairies	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
Red Mulberry *(Morus rubra)*	**Known to Occur**	*Species and General Habitat Protection*	generally grows in moist forest habitats. In Ontario, these include slopes and ravines of the Niagara Escarpment, and sand spits and bottom lands; Can grow in open areas such as hydro corridors	Typical habitat not present on Subject Lands. Not observed during botanical inventories.
White Wood Aster *(Eurybia divaricata)*	**Known to Occur**	*Species and General Habitat Protection*	generally grows in open, dry, deciduous forests. It has been suggested that it may benefit from some disturbance, as it often grows along trails.	Typical habitat not present on Subject Lands. Not observed during botanical inventories.

REPTILES	ESA Protection	**Key Habitats Used By Species**	**Subject Lands**

Blanding's Turtle *(Emydonidea blandingii)*	**Known to Occur**	*Species and General Habitat Protection*	generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.	Typical habitat not present on Subject Lands. Not observed during field surveys.
Eastern Hog-nosed Snake *(Heterodon platirhinos)*	**Historically Known to Occur and May Still Occur**	*Species and General Habitat Protection*	generally prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water.	Typical habitat not present on Subject Lands. Not observed during field surveys.
Eastern Musk Turtle (*Sternotherus odoratus)*	**Known to Occur**	*Species and General Habitat Protection*	Generally prefers shallow, slowmoving water where it typically walks along the bottom rather than swimming	Typical habitat not present on Subject Lands. Not observed during field surveys.
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Known to Occur**	*N/A*	generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Typical habitat not present on Subject Lands. Not observed during field surveys.
Northern Map Turtle *(Graptemys geographica)*	**Known to Occur**	*N/A*	generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	Typical habitat not present on Subject Lands. Not observed during field surveys.
Snapping Turtle *(Chelydra serpentina)*	**Known to Occur**	*N/A*	generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Typical habitat not present on Subject Lands. Not observed during field surveys.
Spiny Softshell *(Apalone spinifera)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers	Typical habitat not present on Subject Lands. Not observed during field surveys.

Appendix F

Significant Wildlife Habitat Assessment Table

Significant Wildlife Habitat Assessment Summary Table for Block 1 Lands.

Significant Wildlife Habitat (SWH) Type	Known or Candidate SWH present/absent	Rationale
SEASONAL CONCENTRATION AREAS OF ANIMALS		
Waterfowl Stopover and Staging Areas	Absent	Suitable habitat not present on Subject Lands
Shorebird Migratory Stopover Area	Absent	Suitable habitat not present on Subject Lands
Raptor Wintering Area	Absent	Suitable habitat not present on Subject Lands
Bat Hibernacula	Absent	Suitable overwintering habitat not present on Subject Lands
Bat Maternity Colonies	Possibly present	Potential habitat in woodland areas. To be assessed as part of future works or in advance of tree removals.
Turtle Wintering Areas	Absent	Suitable overwintering habitat not present on Subject Lands
Reptile Hibernaculum	Absent	Suitable overwintering habitat not observed on Subject Lands
Colonially -Nesting Bird Breeding Habitat (Bank and Cliff)	Absent	Suitable habitat not present on Subject Lands
Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs)	Absent	Suitable habitat not present on Subject Lands
Colonially -Nesting Bird Breeding Habitat (Ground)	Absent	Suitable habitat not present on Subject Lands
Migratory Butterfly Stopover Areas	Absent	Suitable habitat not observed on Subject Lands
Landbird Migratory Stopover Areas	Absent	Suitable habitat not observed on Subject Lands
Deer Winter Congregation Areas	Absent	Suitable winter concentration habitat not present on Subject Lands
RARE VEGETATION COMMUNITIES		
Cliffs and Talus Slopes	Absent	Habitat type not present on Subject Lands
Sand Barren	Absent	Habitat type not present on Subject Lands
Alvar	Absent	Habitat type not present on Subject Lands

Old Growth Forest	Absent	Habitat type not present on Subject Lands
Savannah	Absent	Habitat type not present on Subject Lands
Tallgrass Prairie	Absent	Habitat type not present on Subject Lands
Other Rare Vegetation Communities	Absent	No rare vegetation communities present on Subject Lands
SPECIALIZED HABITATS OF WILDLIFE CONSIDERED SWH		
Waterfowl Nesting Area	Absent	Suitable habitat not present on Subject Lands
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Absent	Suitable habitat not present on Subject Lands
Woodland Raptor Nesting Habitat	Absent	Suitable habitat not present on Subject Lands
Turtle Nesting Areas	Absent	Suitable habitat not present on Subject Lands
Seeps and Springs	Absent	Suitable habitat not present on Subject Lands
Amphibian Breeding Habitat (Woodland)	Absent	Suitable habitat not present on Subject Lands
Amphibian Breeding Habitat (Wetlands)	Absent	Suitable habitat not present on Subject Lands
Woodland Area-Sensitive Bird Breeding Habitat	Absent	Suitable habitat not present on Subject Lands
HABITATS OF SPECIES OF CONSERVATION CONCERN CONSIDERED SWH		
Marsh Breeding Bird Habitat	Absent	Suitable habitat not present on Subject Lands
Open Country Bird Breeding Habitat	Absent	Confirmed habitat not present on Subject Lands. Habitat in CUM1-1/Cultivated Field does not meet criteria.
Shrub/Early Successional Bird Breeding Habitat	Absent	Confirmed habitat not present on Subject Lands. No indicator species present in recent surveys.
Terrestrial Crayfish	Absent	Suitable habitat not present on Subject Lands
Special Concern and Rare Wildlife Species	Absent	Suitable habitat not present on Subject Lands
ANIMAL MOVEMENT CORRIDORS		
Amphibian Movement Corridors	Absent	Suitable habitat not present on Subject Lands
Bat Migratory Stopover Area	Absent	Suitable habitat not present on Subject Lands

Please note the above SWH criteria are based on guidance provided by the Significant Wildlife Habitat Criteria Schedules For Ecoregion 7E and modified to be specific for the Subject Property.

7.0 IMPACT ASSESSMENT

7.1 Proposed Development

The current Block 1 Development Concept Plan (Urbantech November 2021) for the Block 1 lands includes two arterial roads, a mixture of low to medium density residential zones, as well as commercial and institutional uses, community and neighbourhood parks, stormwater management facilities, utility, and general open space. The extent of the arterial roads and stormwater management facilities are illustrated in Figure 5.

In addition to the proposed land uses, Watercourse 5 will be relocated to a watercourse block, which will also incorporate the associated floodplain, meander belt and vegetation protection zones.

The following is a preliminary assessment of potential impacts likely associated with the proposed development of these lands, however it is expected that a more detailed analysis of potential impacts will be completed as part of site-specific applications and incorporating detailed development, grading and servicing plans.

7.2 Terrestrial

Based on the conceptual plan, the following impacts may or will occur when the plan is implemented, affecting identified NHS features and ecological functions.

Direct Impacts

- Potential encroachment into NHS features during channel re-construction;
- Removal of potential open country habitat which may support avian Species at Risk and other associated species, and conversion to a variety of residential-focused urban land uses.
- Disturbance or destruction of nesting birds by clearing and grading works;
- Major road crossings of Watercourses 5 and 6, affecting aquatic habitat as well as previously disturbed riparian and wetland communities currently associated with the watercourses.
- Potential impacts of road crossings on linkages.
- Relocation and reconstruction of portions of Watercourses 5, and potentially Watercourse 6; and
- Introduction of stormwater management infrastructure adjacent to the NHS – ponds, outlets etc.

Indirect Impacts

- Potential erosion and sedimentation during construction.
- Alteration of existing drainage patterns, and introduction of impervious cover affecting runoff rates.
- Displacement or confinement of existing wildlife; future development will restrict key wildlife groups to the NHS and 'softer' landscape elements such as stormwater management facilities.

- Introduction of stormwater management facilities and restored channel corridors offering long term 'green infrastructure' i.e. successional habitat and associated ecological functions.
- Wildlife impacts associated with lighting; and
- Potential water quality impairment associated with de-icing compounds.

Roads and Grading Impacts

With respect to grading, preliminary road grades provided by Urbantech indicate that the arterial roads will generally respect existing grades; however, surface flows from development lands will be directed into the stormwater system and outlet to one of three proposed stormwater facilities to be located near Barton Street. This will require some moderate increasing of grades at the draft plan scale to direct runoff towards the front of lots and building sites, and toward the arterial roads.

Construction of the road network will require the removal of vegetation from various areas of the Subject Lands. A majority of these roads will have no impact on significant natural heritage features, however vegetation removal will be required. It is recommended that appropriate mitigation measures below be incorporated during construction to help avoid impacts to wildlife in the area.

As illustrated in Figure 5, a crossing of Watercourse 5 has been proposed. It is anticipated that this crossing will be designed to convey storm flows and have little impact on the channel of the watercourse. Although wildlife movement in the area was observed to be limited, it is recommended that the culvert to be installed be designed to assist with wildlife passage under the roadway. Details and features to be incorporated should be discussed at detailed design.

Stormwater Management Ponds

As illustrated in Figure 5, three stormwater management facilities are proposed within the Study Area. The stormwater pond to be constructed in the northwest corner of the Block is proposed to be constructed in an area that is vegetated with scattered trees and shrubs. Removal of vegetation will be required to construct this pond, however our assessment indicates that this vegetation is not providing any significant habitat functions. It is recommended that a more detailed assessment of potential impacts to trees and vegetation be completed when designs have been finalized, however no impacts to significant natural heritage features are anticipated.

The stormwater pond located at the end of the Block is proposed to be constructed in an area with few trees or any observed natural heritage features. Construction of this pond will have no impact on natural heritage features, however it is recommended that trees be retained around the pond where possible.

The stormwater pond proposed in the northeast corner of the block is proposed to be constructed primarily within a small vineyard and adjacent to a suspected woodland. Removal of vegetation associated with the vineyard will have no impact on adjacent natural heritage features. It appears that a small portion of the woodland may be required to be removed to construct the pond in this area, however this woodland was not assessed during our surveys and the extent of the woodland on the affected property has not been verified. It is anticipated that the majority of grading associated with this pond will occur adjacent to the woodland, however it is recommended that an assessment of potential impacts to trees in the woodland be completed when detailed designs are available. This pond will have no impact on the observed functions of Watercourse 6.

Watercourse Relocation

Relocation of Watercourse 5, and profile adjustments to create a more consistent gradient, will reduce barriers to fish movement, and will produce more uniform floodplain conditions to allow for wetland creation. Based on a preliminary design which accommodates a 23m meander belt, GEOMorphix has estimated that up to 0.6 ha of new floodplain wetlands will ultimately be created.

Currently the channels of Watercourses 5 and 6 are extensively impacted by adjacent land uses, resulting in fragmented pockets of quality riparian vegetation. We recommend that a range of vegetation communities and habitat types be targeted for restoration within the new watercourse corridor, including upland woodland and thicket in the VPZs and on slopes, and marsh and thicket swamp in the floodplains. Offline depressions can also help diversify vegetation communities on these lands.

Although detailed designs have yet to be prepared, it is recommended that natural channel design features be incorporated into the relocated channel. This will help ensure a stable channel profile and minimize the potential for erosion. It is recommended that only native plants be incorporated into restoration areas and that the restoration areas be monitored periodically to ensure success of plantings and manage for invasive species as needed.

Based on the current preliminary grading information, areas that do not drain to the stormwater management system will likely be confined to the west side of Watercourse 5, and to the developments west of Watercourse 6. Clean runoff from rooftops and backyards in this area can benefit both the watercourse and restored or created habitats that are contained within the NHS corridors. Impacts are intended to be addressed through a variety of measures, including feature protection, VPZ's and mitigation to be determined through scoped Environmental Impact Statements as part of draft plans of subdivision.

8.0 MITIGATION MEASURES

Mitigation measures should be provided based on site-specific designs; however the following are a list of preliminary mitigation measures to be considered during detailed design and staging.

- It is recommended that watercourse crossings be designed with the input of the Fluvial Geomorphologist to assist with minimizing impacts to the meander belt associated with Watercourses 5.
- It is recommended that watercourse crossings be designed to incorporate wildlife passage elements to minimize any potential impacts to wildlife movements.
- Adequate sediment and erosion controls should be installed prior to the commencement of work to help prevent any off-site movement of soil material during construction. Sediment controls should remain in place until all disturbed areas have been vegetated and stabilized.
- It is recommended that tree preservation and management plans be prepared as part of future applications to assess the potential for retaining trees within the study area. Any tree removals required to facilitate servicing or future development should be replaced with suitable native species and incorporated into landscape plans or installed on public lands.
- Pollinator gardens should be incorporated into public lands and landscape plans where possible and appropriate.

- Any required tree removal should be conducted between September 15 and March 30 to avoid impacting nesting birds or roosting bats in the area. Nest sweeps or assessments for use by bats should be conducted prior to any vegetation removal outside of this timing window.
- The use of street lighting in the vicinity of watercourses and natural areas should be minimized where possible. Appropriate shading or directional lighting is recommended where needed to minimize light pollution into naturalized areas.
- It is recommended that the use of LID technologies be considered where possible to lessen the volume of runoff and promote infiltration.
- Continuous fencing should be installed at the rear of each lot backing onto the watercourse blocks to limit the potential for encroachment into VPZ's.
- It is recommended that grading be avoided where possible in designated VPZ's. Where grading is required to occur, it is recommended that a restoration plan be prepared to ensure the affected VPZ will continue to function as intended.
- It is recommended that MECP be engaged early in the design process to discuss Species at Risk requirements and maintain compliance with provincial legislation.
- Several locally rare and uncommon species were documented in the Study Area during our assessments. To help maintain these species in the area, it is recommended that any locally rare or uncommon species be identified and assessed for relocation to parklands and VPZ's within the Block. Further assessment and planning for relocations should occur as part of future site-specific assessments and applications.
- Any relevant recommendations or best management practices from the City of Hamilton Salt Management Plan should be considered during future applications of de-icing compounds.
- It is recommended that site-specific EIS's be completed as part of future applications. EIS's are recommended to by scoped through consultation with City of Hamilton and Hamilton Conservation Authority staff. Any relevant recommendations included in the City of Hamilton Biodiversity Management Plan and Climate Change Impact Adaptation Plan should be incorporated into future EIS's.

9.0 RECOMMENDATIONS

The primary intent of this project is to characterize natural heritage features on the Subject Lands and delineate the extent of any Core Areas as defined by the UHOP. Core Areas on the Subject Lands consist of Watercourse 5 and Watercourse 6, as well as associated riparian areas. Watercourses 5 and 6 were determined to be intermittent warmwater watercourses, which are providing contributions to fish habitat downstream of the Subject Lands. To protect the integrity of these watercourses, it is recommended at this time that a 15m buffer be established from the edge of the bankfull channel, on both sides of the watercourse. This watercourse buffer will also serve to maintain any linkage between areas upstream and downstream of the Subject Lands.

As Watercourses 5 and 6 are the primary natural heritage features in the Study Area, it is recommended that restorations plans be prepared for these watercourses and riparian areas as part of future development applications. Restoration plans should consider factors such as incorporating natural channel design elements, improving habitat conditions in riparian areas,

incorporating native species into planting plans and implementing aquatic and terrestrial wildlife habitat enhancements.

In addition to Watercourses 5 and 6, our assessment indicates that potential bat roosting habitat is located in treed areas along the north end of the Study Area, as well as along Watercourse 6 and in an isolated thicket in the southwest corner of the Study Area. It is recommended that bat use of these areas be further assessed prior to tree and vegetation removals in these areas. Any works to be completed in proximity to bat roosting habitat should be conducted in accordance with provincial legislation.

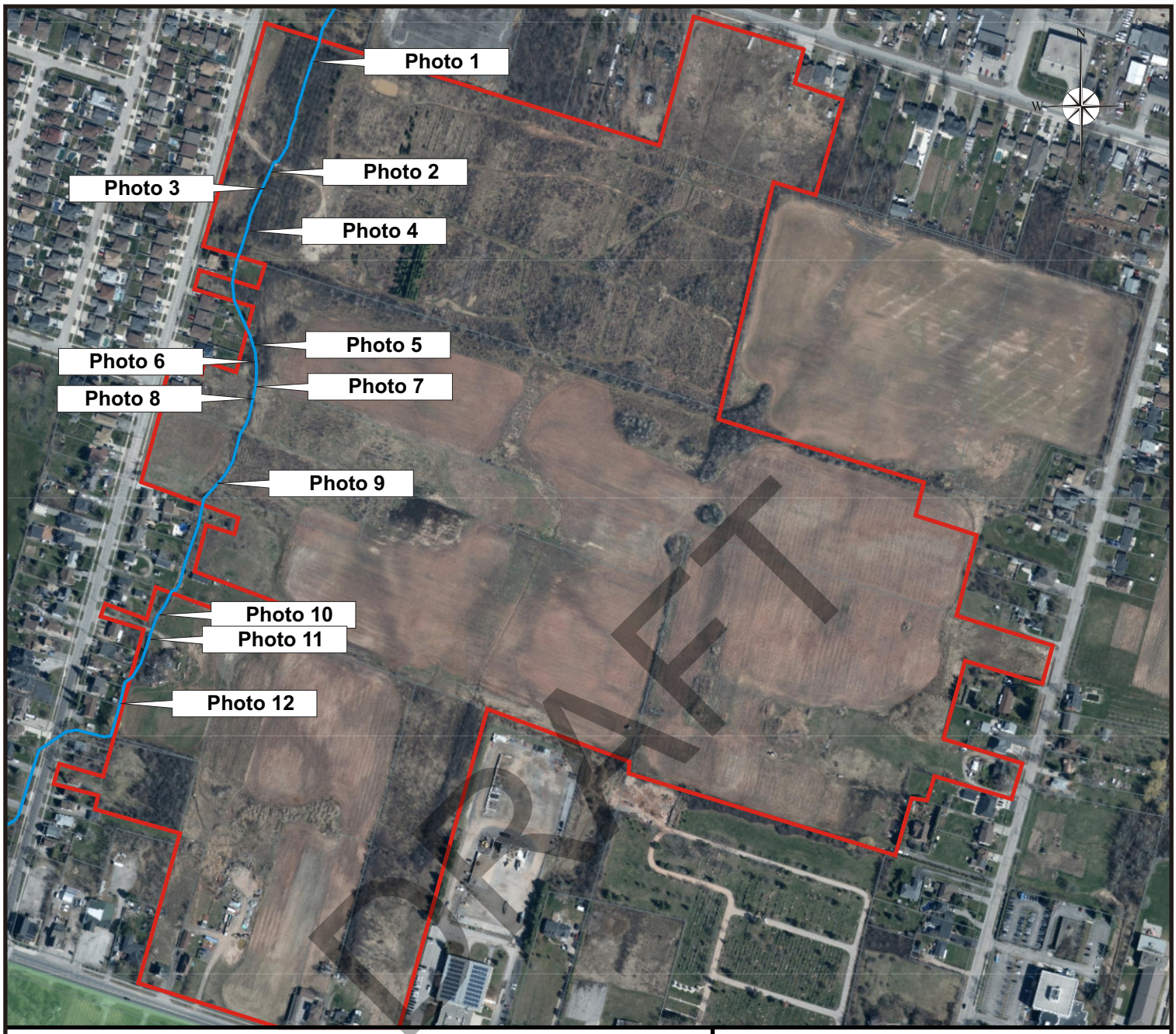
From our assessment, a portion of the Subject Lands consists of a cultural meadow/cultivated area that has historically provided potential breeding habitat for Bobolink and Eastern Meadowlark. The extent of potential Open Country habitat is delineated in Figure 5. As this area is less than 30ha in size, it is recommended that MECP be contacted prior to any detailed designs for the Subject Lands to discuss any obligations to remain compliant with provincial legislation.

Although this report includes identified VPZ's adjacent to Watercourses 5 and 6, as well as suspected woodland features, it is recommended that the appropriateness of these buffers be assessed as part of future site-specific EIS's, when detailed designs have been completed. Future EIS's should be scoped in consultation with City of Hamilton and Hamilton Conservation Authority staff and prepared following City of Hamilton EIS Guidelines. Any relevant recommendations included in the City of Hamilton Biodiversity Management Plan and Climate Change Impact Adaptation Plan should be incorporated into future EIS's.

Please do not hesitate to contact the undersigned should you have any question regarding this project.

Respectfully submitted by:

Ian Barrett, M.Sc.
Colville Consulting Inc.



Legend

Subject Lands

Watercourse 5

Figure 1
Watercourse 5 Photo Locations on the Subject Lands

Natural Heritage Features Analysis – Block 1 Lands, City of Hamilton

Prepared for: **Block 1 Landowners Group**

Prepared by: COLVILLE CONSULTING INC.

DATE: June 2025

FILE: C18028

Photo 1: Example of channel conditions in Watercourse 5 near the north end of the Study Area. Photo facing north.

Photo 2: Channel conditions in Watercourse 5 immediately south of culvert and access laneway at 248 Fruitland Road. Photo facing north.

Photo 3: Example of channel conditions in Watercourse 5 further south of culvert and access laneway at 248 Fruitland Road. Photo facing northeast.

Photo 4: Example of channel and bank conditions in Watercourse 5. Photo facing north.

Photo 5: Example of channel conditions in Watercourse 5 before crossing 252 Fruitland Road property (visible in background). Photo facing northwest.

Photo 6: Example of channel conditions in Watercourse 5 within thicket east of 250 Fruitland Road. Photo facing northwest.

Photo 7: Example of channel conditions in Watercourse 5 within thicket east of 248 Fruitland Road. Photo facing south.

Photo 8: Example of channel conditions in Watercourse 5 east of 242 Fruitland Road. Photo facing south.

Photo 9: Example of channel conditions and debris in Watercourse 5 east of 230 Fruitland Road. Photo facing southwest.

Photo 10: Example of channel conditions in Watercourse 5 east of 214 Fruitland Road. Photo facing north.

Photo 11: Channel conditions in Watercourse 5 immediately north of culvert and access laneway at 212 Fruitland Road. Photo facing north.

Photo 12: Example of channel conditions and woody debris in Watercourse 5 near the south end of the Study Area and east of 204 Fruitland Road. Photo facing west.