



global environmental solutions

**Home Farm
Town of the Blue Mountains, Ontario**

Environmental Impact Study

April 2015

SLR Project No: 209.40019.00000

Environmental Impact Study

Home Farm, Town of the Blue Mountains, Ontario

SLR Project No.: 209.40115.00000

Prepared by
SLR Consulting (Canada) Ltd.
300 Town Centre Blvd – Suite 200
Markham, Ontario L3R 5Z6

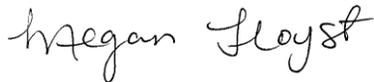
for

MacPherson Builders (Blue Mountains) Ltd.
40 West Wilmot Street, Suite 6
Richmond Hill Ontario L4B 1H8

April 2015

Prepared by:

Reviewed by:



Megan Lloyst, M.Sc., B.Sc.
Aquatic Biologist

Gord Wichert, Ph.D., M.Sc., B.Sc. Bio
Senior Ecologist



Sam Gildiner, R.P.F.
Ecologist

Dale Leadbeater, B.Sc., B.Ed., P.Biol.
Senior Ecologist

Distribution: 1 copy – MacPherson Builders (Blue Mountains) Ltd.
1 copy – Wellings Planning Consultants Inc.
1 copy – Higgins Engineering
1 copies – SLR Consulting (Canada) Ltd.

TABLE OF CONTENTS

1.0	INTRODUCTION.....	4
1.1	Study Area.....	4
2.0	GOALS AND OBJECTIVES	4
3.0	POLICY CONTEXT	4
3.1	Provincial Policy Statement.....	5
3.2	The Endangered Species Act.....	5
3.3	Niagara Escarpment Planning and Development Act, 1973 (updated October 2012)	6
3.4	The Town of the Blue Mountains Official Plan.....	6
	3.4.1 Official Plan Section 8 – Natural Heritage and Development Constraints .6	
	3.4.1.1 Nipissing Ridge	7
	3.4.2 Blue Mountains Tree Preservation By-Law No. 2010-63.....	7
3.5	Ontario Regulation 151/06: The Development, Interference with Wetlands and Alteration to Shorelines and Watercourse Regulation.....	7
3.6	Fisheries Act	7
3.7	Migratory Birds Convention Act (1994).....	8
4.0	METHODOLOGY.....	8
4.1	Desktop Analysis	8
4.2	Terrestrial Resources	9
	4.2.1 Agency Correspondence	9
	4.2.2 Ecological Land Classification and Vegetation Inventory	10
	4.2.3 Wildlife.....	10
	4.2.3.1 Breeding Birds.....	10
	4.2.3.2 Amphibians.....	10
4.3	Aquatic Environment.....	10
	4.3.1 Agency Correspondence	10
	4.3.2 Field Investigations	11
	4.3.2.1 Aquatic Habitat.....	11
	4.3.2.2 Fish Collection.....	11
	4.3.2.3 Benthic Invertebrate Community.....	11
	4.3.2.4 Instream Barrier Assessment.....	12
5.0	EXISTING CONDITIONS	12
5.1	General Physiology and Geology	12
5.2	Terrestrial Resources	13
	5.2.1 Vegetation.....	13
	5.2.2 ELC Polygon Descriptions.....	15
	5.2.3 Flora.....	19
	5.2.4 Breeding Birds.....	20
	5.2.5 Amphibians.....	20
	5.2.6 Seeps.....	21
	5.2.7 Species at Risk and Rare Species.....	21
	5.2.8 Landscape Connectivity.....	23
	5.2.9 Significance and Sensitivity.....	23
	5.2.9.1 Significant Wildlife Habitat.....	23
	5.2.9.2 Summary	24
5.3	Aquatic Environment.....	24
	5.3.1 Ravine.....	25
	5.3.2 Watercourses.....	25

5.3.3	<i>Fish Community</i>	26
5.3.4	<i>Fish Species at Risk</i>	28
5.3.5	<i>Instream Barriers</i>	29
5.3.6	<i>Assessment of the Aquatic Environment Sensitivity</i>	30
5.3.7	<i>Fish and Fish Habitat Summary</i>	30
5.3.8	<i>Benthic Invertebrate Community</i>	31
6.0	SUMMARY OF KEY ATTRIBUTES AND FUNCTIONS	32
6.1	Terrestrial Ecosystem.....	32
6.2	Aquatic Environment.....	33
7.0	DESCRIPTION OF PROPOSED DEVELOPMENT	33
8.0	IMPACT ANALYSIS AND MITIGATION	33
8.1	Physiography and Geology.....	33
8.2	Impacts of the Proposed Development on Terrestrial Ecosystems.....	34
8.2.1	<i>Vegetation Removals</i>	34
8.2.2	<i>Species at Risk</i>	37
8.2.3	<i>Wildlife</i>	37
8.2.3.1	<i>Species of Conservation Concern</i>	37
8.2.3.2	<i>Area Sensitive Breeding Birds</i>	37
8.2.4	<i>Landscape Connectivity</i>	38
8.2.5	<i>Summary of Impacts of the Proposed Development on Terrestrial Ecosystems</i>	38
8.3	Mitigation of Terrestrial Impacts.....	39
8.3.1	<i>Butternut</i>	39
8.3.2	<i>Wetlands</i>	39
8.3.3	<i>Wildlife</i>	40
8.3.4	<i>Landscape Connectivity</i>	40
8.3.5	<i>Restoration Plan Concepts</i>	40
8.3.6	<i>Summary of Impacts, Mitigation Measures, and Determination of Scale of Residual Effects</i>	41
8.4	Impacts of the Proposed Development on Aquatic Environment.....	43
8.4.1	<i>Assessment Process</i>	43
8.4.2	<i>Impact Assessment</i>	44
8.5	Mitigation of Aquatic Impacts.....	46
8.5.1	<i>Fish Protection</i>	47
8.5.2	<i>Erosion and Sediment Control</i>	47
8.5.3	<i>Construction Access, Site Controls and Operational Constraints</i>	47
8.5.4	<i>Rehabilitation Following Construction</i>	48
8.5.5	<i>Summary of Impacts, Mitigation Measures, and Determination of Scale of Residual Effects</i>	48
8.6	<i>Categorization of Project Risk and Likelihood of Serious Harm to Fish</i>	50
9.0	IMPLEMENTATION AND MONITORING PLAN	50
10.0	CONCLUSIONS	50
11.0	REFERENCES	52

TABLES

Table 4-1: Species at Risk Screening Results.	9
Table 4-2: Rare Species Previously Identified Near the Study Area, NHIC.	9
Table 5-1: ELC communities	14
Table 5-2: Area Sensitive Bird Species	20
Table 5-3: Applicability of Study Area to Species at Risk, Conservation Concern, and Rare species	22
Table 5-4: Significance and Sensitivity Summary.	24
Table 5-5: Thermal Properties Collected in Water Feature A & B	27
Table 5-6: Fish Species Noted Within Study Area	27
Table 5-7: Fish Species Habitat Requirements	28
Table 5-8: Existing Fish and Fish Habitat Conditions Summary and Sensitivity Rankings	30
Table 5-9: Existing Aquatic Conditions Summary	31
Table 5-10: Benthic Invertebrate Communities Summary	32
Table 6-1: Key Functions and Features of Existing Conditions	32
Table 8-1: Proposed Removals by Habitat Type and ELC Polygons.....	35
Table 8-2: Vegetation Removal Summary.	38
Table 8-3: Summary of Potential Impacts and Effects to Significant Features.....	39
Table 8-4: Summary of Impacts, Mitigation, and Net Residual Effects.	42
Table 8-5: Summary of Anticipated Project Impacts	45
Table 8-6: Fish and Fish Habitat Residual Effects Table	49

FIGURES

Figure 1 – Study Location Map
Figure 2 – Study Area and Applicable Policy Areas
Figure 3 – Terrestrial Environment – Existing Conditions
Figure 4 – Landscape Connectivity
Figure 5 – Aquatic Environment – Existing Conditions
Figure 6 – Site Plan
Figure 7 – Impacts to Terrestrial Environment
Figure 8 – Impacts to Aquatic Environment

APPENDICES

Appendix A	MNR Communication Record
Appendix B	Plant Species List
Appendix C	Bird Species List
Appendix D	Butternut Records
Appendix E	Significant Wildlife Habitat Screening
Appendix F	Instream Barrier
Appendix G	Ephemeral Drainage Path

1.0 INTRODUCTION

SLR Consulting (Canada) Ltd. (SLR) was retained by MacPherson Builders (Blue Mountains) Limited to undertake an Environmental Impact Study (EIS) for the proposed residential housing development east of Grey County Road No. 19 north of the Niagara Escarpment in the Town of the Blue Mountains (Craigleith), Ontario, hereafter referred to as the Home Farm Development. This report describes the existing conditions of the natural environment, as well as potential impacts from proposed development and mitigation as per the requirements of the Town of Blue Mountains Official Plan (2007).

1.1 Study Area

The site is located on the east side of Grey County Road No. 19 north of the Niagara Escarpment in the Town of the Blue Mountains (Craigleith), Ontario. The site is classified as Escarpment Recreational with Natural and Cultural Heritage Features present on site: the Nipissing Ridge and the Plater-Martin archaeological area. Existing residential housing occurs to the south and west of the subject lands (Figure 1), and a Provincially Significant Wetland (Silver Creek Wetland Complex) to the northeast.

2.0 GOALS AND OBJECTIVES

The goal of this EIS is to delineate the natural heritage features, determine the impacts of the proposed development, and identify appropriate mitigation to the satisfaction of the Town of the Blue Mountains (the Town) and Grey Sauble Conservation (GSCA). As per Section 8.25 of the Town of Blue Mountains Official Plan, the objectives include analysis and plans showing the following (Town of Blue Mountains, 2007):

1. A description of the natural environment, including both physical form and ecological function;
2. Summary of the development proposal;
3. Prediction of potential direct, indirect and cumulative effects of development compared to overall environmental goals;
4. Identification and evaluation of options to avoid impacts;
5. Identification and evaluation of options for mitigation or rehabilitation, including setbacks;
6. A plan for implementing the development and environmental management, and
7. Evaluation of the need for a monitoring plan.

3.0 POLICY CONTEXT

Development on the site is subject to a number of federal, provincial and local environmental policies, most of which provide direction and guidance regarding land use changes and construction (Figure 2). Please note that there are several areas in which stream channels appear outside the boundaries of hazard areas. This is recognized as an error in the mapping provided by the GSCA and the watercourse layer available on Land Information Ontario and will be rectified during later design phases. An initial review of the applicable natural heritage policy was carried out to determine appropriate investigations required to satisfy the legislative context that applies to the subject lands, including but not limited to the following instruments:

- The Provincial Policy Statement (PPS, 2005);
- The Town of the Blue Mountains Official Plan (2007);

- Town of The Blue Mountains Tree Preservation By-Law 2010-68;
- Ontario Regulation 151/06 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (GSCA);
- Ontario’s Endangered Species Act (2007);
- Migratory Birds Convention Act (1994); and
- The Niagara Escarpment Plan (1973).
- Fisheries Act (2012)

3.1 Provincial Policy Statement

Policy 2.1 of the Provincial Policy Statement (PPS) (MMAH 2014) issued under Section 3 of The Planning Act provides direction to regional and local municipalities regarding planning policies, including the protection and management of natural heritage features and resources. Section 3 of the Planning Act requires that decisions affecting planning matters “shall be consistent with” policy statements under the Act. Section 2.1 of the PPS requires that no development shall occur in significant features unless it is demonstrated that features and functions will not be negatively impacted.

The 2014 PPS states that Development and site alteration shall not be permitted in Significant Wildlife Habitat (SWH) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. The Significant Wildlife Habitat Technical Guide (OMNRF 2000) and Decision Support Criteria were developed to support planners in determining whether SWH could be affected by proposals for land use change in the context of the Planning Act.

The local planning authority has the responsibility of designate SWH. The Town of the Blue Mountains is located within Ecoregion 6E for which criteria are provided. The Town has not identified SWH within the Study Area. This report screens conditions within the Home Farm study area against Ecoregion 6E criteria in order to identify the potential for SWH and to avoid or mitigate negative impacts.

The background review and field investigations identified the ravines located onsite have one or more Significant Natural Heritage Features associated with them (high and moderate ecological constraints). In the northwest area of the site is the Petun Plater-Marten archaeological site. ESG International, HPA Ltd., and Archaeological Services Inc. determined, in accordance with the Town of Blue Mountains Official Plan Section 8, a 30 m buffer is required for the archaeological site.

3.2 The Endangered Species Act

The Endangered Species Act (ESA, 2007) is a provincial statute administered by the Ministry of Natural Resources and Forests (MNRF). The goal of the ESA, 2007 is:

- 1. To identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge;*
- 2. To protect species that are at risk and their habitats, and to promote the recovery of species that are at risk; and,*
- 3. To promote stewardship activities to assist in the protection and recovery of species that are at risk.*

The Act defines mandatory habitat protection with a science-based approach to listing species for protection. Endangered, threatened and extirpated species on this list automatically receive legal protection under the ESA 2007. There are species listed under the Act observed on site through field investigations. They will be managed in accordance with the legislation.

3.3 Niagara Escarpment Planning and Development Act, 1973 (updated October 2012)

In June 1973, the Niagara Escarpment Planning and Development Act was passed and the Niagara Escarpment Plan (NEP) was later released (the latest update being October 2012). The NEP delineates the boundaries of the Niagara Escarpment Plan area and provides land use designations and development criteria for within those boundaries. The Niagara Escarpment was also designated a World Biosphere Reserve in 1990 by UNESCO to further promote the importance of the natural and ecological features within the Niagara Escarpment area. The subject property occurs within the limits of the NEP area and is designated as Escarpment Recreational. There are several objectives listed in the NEP section of the Official Plan for land in the Escarpment Recreation designation, the overarching objective applicable to residential development is that “growth should be compatible with and provide for the protection of unique ecologic, historic and archaeological areas, wildlife habitats, streams and water supplies and other environmentally sensitive areas both inside and adjacent to Escarpment Recreation Areas” (Town of Blue Mountains, 2007).

Uses permitted under the Official Plan are only permitted in the NEP Area if they comply with the NEP. If there is a conflict between the Official Plan and the NEP, the provisions of the NEP shall prevail, i.e., the NEP takes precedence. However, Land use policies in OP apply throughout the town as well as in the NEP areas. In most cases, land use policies are the same.

3.4 The Town of the Blue Mountains Official Plan

The Study Area is designated as “Recreational Residential” with “Slope, Floodplain and Shoreline (Nipissing Ridge) Hazards” (Hazard Lands), and the “Nipissing Ridge geological feature” according to the Town of the Blue Mountains Official Plan Schedule A – Map 4 – Land Use (2005). The entire Study Area is classified as “Archeology Areas” according to Appendix Map D – Natural Heritage Features and “Escarpment Recreation” according to Appendix Map F – Niagara Escarpment Plan Area and Development Control Area (2005). According to the Town’s Official Plan, “Recreational Residential” designations allow for low density residential uses and recreational uses. According to the Town’s Official Plan, “Hazard Lands” permit uses of land that do not require the construction of buildings or structures in order to operate. Setbacks for buildings may be imposed based upon the area designated as Hazard Lands.

3.4.1 Official Plan Section 8 – Natural Heritage and Development Constraints

The goal of the Town of the Blue Mountains Official Plan Section 8 – Natural Heritage and Development Constraints (including the Niagara Escarpment Development Controls) is to protect and enhance the natural environmental systems, their functions and resources over the long term. It also appears to incorporate and promote sustainable development practices and initiatives that will protect the Niagara Escarpment and Natural Heritage features.

This EIS follows guidelines included in the Natural Heritage and Development Constraints section of the OP.

3.4.1.1 *Nipissing Ridge*

The Nipissing Ridge is a formation from the first bluff of the Lake Nipissing Shorecliff. The prominent geological feature is designated as “Hazard Land” within the Blue Mountain OP.

The Nipissing Ridge runs diagonally through the Study Area from northwest to southeast and is included in the “Hazard Lands” area indicated on Appendix Map A-1 of the Blue Mountains OP. A 15 m setback from the ridge is required.

3.4.2 *Blue Mountains Tree Preservation By-Law No. 2010-63*

The Tree Preservation By-law (By-law No. 2010-68) of the Municipal Code requires a permit to injure or destroy trees which have reached or can reach a height of at least four (4) metres at physiological maturity within the boundaries of the Municipality. An Arborist report to support a permit to injure or destroy any trees in the Study Area is required, which will be included at a later design phase of the project.

3.5 Ontario Regulation 151/06: The Development, Interference with Wetlands and Alteration to Shorelines and Watercourse Regulation

The Grey Sauble Conservation Authority (GSCA), under the Conservation Authorities Act, R.S.O. 1990, c. C.27, administers Regulation 151/06. The objective of Regulation 151/06 is to ensure public safety and protect property with respect to natural hazards (steep slopes such as the Nipissing Ridge) and to safeguard watershed health by preventing pollution and destruction of sensitive environmental areas such as wetlands, shorelines and watercourses. Under this regulation, any proposed development, interference or alteration (e.g. placement or removal of material) within a Regulated Area requires a review by GSCA.

Part of the Study Area is within a portion of the Regulated Area. A permit will be required from the GSCA for any land use change within the Regulated Area. The Regulated Area may be changed by GSCA upon EIS review and site inspection.

3.6 Fisheries Act

The federal Fisheries Act (Section 35) (amended June 2012) is the primary piece of legislation in Canada governing the protection, conservation and management of fish and fish habitat. This Act is enforced by Fisheries and Oceans Canada. The Act prohibits serious harm to fish that are part of or support a commercial, recreational, or Aboriginal (CRA) fishery. Harm can be caused by proposed works, undertakings or activities that affect fish habitat, passage of fish or modify flow in watercourses. If serious harm to fish that are part of or support commercial, recreational or Aboriginal fisheries will occur as the result of a proposed undertaking, the proponent is required to prepare a habitat off-set plan and obtain an Authorization under the Fisheries Act 35(2)(b) prior to commencing works.

If a project cannot avoid *serious harm* to fish and, through the application of DFO's Self-Assessment process, has been identified as a project which requires review, a Request for Project Review is required by DFO.

Permanent and intermitted unnamed watercourses supporting fish and fish habitat occur on the project site. The features comprise a network that flows north to northeast and ultimately outlets into Georgian Bay. The likelihood of causing *serious harm* to fish and fish habitat as a result of the proposed development will be determined.

3.7 Migratory Birds Convention Act (1994)

The Migratory Birds Convention Act (1994) and its complimentary regulations ensure the conservation of migratory bird populations by regulating potentially harmful human activities. It aims to protect migratory birds, their eggs, and their nests from hunting, trafficking, and commercialization. The removal of trees and old field providing habitat for breeding birds will be subject to the Migratory Birds Convention Act 1994.

Environment Canada maintains a website titled “General Avoidance Information” (Environment Canada, 2014), which includes “General Nesting Periods for Migratory Birds in Canada” that summarizes breeding bird windows in order to avoid negative impacts to breeding birds and their nests. For Zone C3, in which the Study Area lies, extreme limits of breeding season for birds adapted to Wetlands, Open Habitat, and Forest, is from April 1 to August 31. A high percentage of species (41%-100%) breed between May 5 – July 30.

In order to ensure compliance with this Act and its Migratory Bird Regulations (MBR) Environment Canada recommends removing trees outside the extreme limits of the breeding season (May 5 – July 30).

4.0 METHODOLOGY

4.1 Desktop Analysis

In order to characterize the natural environment on the subject lands, the following existing documentation was reviewed:

- a. Terraprobe Geotechnical Investigation (July 2011)
- b. Town of the Blue Mountains Official Plan (March 2007)
- c. ESG Environmental Impacts Study for Home Farm development (May 2002)
- d. CRA Phase I ESA Supplemental Information (February 1999)
- e. Watershed Characterization - Assessment Report for the Grey Sauble Source Protection Area (2011)
- f. Aerial photography and surficial geology mapping.
- g. Realigned Meandering Low Flow Channel, Baird & Associates (December 2014)
- h. Preliminary Storm Servicing Drawings, Drawing No. 1410 – STM 1 (May 2014)
- i. Ontario Benthos Biomass Network: Protocol Manual. 2007.
- j. Ontario Stream Assessment Protocol. Version 9.0. (2013).

This secondary source review and desktop analysis of the general Study Area was performed to identify known natural heritage features and functions within and adjacent to the general Study Area. This information was supplemented using data collected during recent field investigations for this study to develop a description of the natural environment, inform the evaluation of alternatives and identify potential impacts of the technically preferred solution.

The Ontario Natural Heritage Information Centre (NHIC) compiles, maintains and distributes information on natural species, plant communities and spaces of conservation concern in Ontario. Fisheries and Oceans Canada (DFO) annually prepares distribution maps for fish and mussel Species at Risk. The OMNRF provides advice with respect to the potential for occurrences of SAR listed under ESA, 2007. These data sources were consulted for

occurrences of nationally and/or provincially designated Species at Risk and Provincially Rare Species (S1-S3) within the general Study Area.

4.2 Terrestrial Resources

4.2.1 Agency Correspondence

Ministry of Natural Resources and Forestry (MNR) provided advice regarding potential Species at Risk listed under ESA, 2007 in the vicinity of the Study Area. According to Jodi Benvenuti, Management Biologist, Midhurst District, Table 4-1 lists the species with the greatest potential to be present. Please see Appendix A for communication records.

**Table 4-1:
Species at Risk Screening Results.**

Common Name	Scientific Name	Status
Barn Swallow	<i>Hirundo rustica</i>	Threatened
Butternut	<i>Juglans cinerea</i>	Endangered
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Endangered
Canada Warbler	<i>Wilsonia canadensis</i>	Special Concern
Eastern Wood Pewee	<i>Contopus virens</i>	Special Concern
Milksnake	<i>Lampropeltis triangulum</i>	Special Concern
Snapping Turtle	<i>Chelydra serpentina</i>	Special Concern

In addition to contacting MNR, SLR conducted a search of the Ontario Natural Heritage Information Centre (NHIC) database in the three 1 km² squares that encompass the Study Area. This search, in addition to Barn Swallow, identified three rare species previously identified in the vicinity of the Study Area (Table 4-2).

**Table 4-2:
Rare Species Previously Identified Near the Study Area, NHIC.**

Common Name	Scientific Name	S Rank
Stiff Yellow Flax	<i>Linum medium var. medium</i>	S3?
Variiegated Meadowhawk	<i>Sympetrum corruptum</i>	S3
Snapping Turtle	<i>Chelydra serpentina</i>	S3 Special Concern (COSEWIC and COSSARO)

S3 – Vulnerable: Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

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

4.2.2 Ecological Land Classification and Vegetation Inventory

In May of 2002, ESG completed an EIS for the Study Area that includes Ecological Land Classification (ELC) and a vegetation inventory. SLR ecologists conducted terrestrial field investigations in August 2011 as terrestrial systems can change significantly over a nine year period. The vegetation communities on the subject lands were classified according to the Ecological Land Classification for Southern Ontario (MNR Internal Draft, 2008) where appropriate. Soil samples were completed in representative polygons. All vegetation encountered was recorded, and the location of groundwater indicators was mapped.

Searches for rare species and Species at Risk were undertaken during ELC and Vegetation surveys. During all surveys, incidental wildlife observations were recorded.

4.2.3 Wildlife

4.2.3.1 Breeding Birds

Breeding bird surveys were conducted on the mornings of June 16 and July 2, 2012. Surveys occurred between 6:00 am and 10:00 am, within the prescribed breeding window and during times and environmental conditions as required by the Ontario Breeding Bird Survey. Six point counts were completed (Figure 3), spaced more than 200 m apart and, where practical, in different habitat types. A confirmation of breeding is defined as a species being noted on each of the two surveys.

4.2.3.2 Amphibians

Amphibian call surveys were conducted on the evenings of April 22, June 2, and June 30, 2012. Eleven points were surveyed throughout the property. Surveys occurred after dusk, within the proper season, and in environmental conditions as prescribed the by Marsh Monitoring Protocol. The locations of amphibian survey points are shown on Figure 3.

Searches for rare species and Species at Risk were undertaken during breeding bird, and amphibian surveys. During all surveys, incidental wildlife observations were recorded.

4.3 Aquatic Environment

4.3.1 Agency Correspondence

The general Study Area occurs within the jurisdictional boundaries of the Grey Sauble Conservation Authority (GRCA) and the Midhurst District of the Ontario Ministry of Natural Resources (MNRF). The following individuals from these organizations were contacted regarding natural heritage information for the general Study Area (pertinent correspondence records are provided in Appendix A):

- Ministry of Natural Resources, Huronia Area, Midhurst

Graham Findley, Management Biologist

- Grey Sauble Conservation Authority

Andrew Sorensen, Environmental Planning Coordinator

4.3.2 Field Investigations

4.3.2.1 Aquatic Habitat

SLR biologists characterized aquatic habitat conditions within the Study Area based on site visits from 2011 to 2014 during winter (January), spring (April), and summer (July) and spring 2015 (April).

The objective of field investigations was to map and describe the existing aquatic habitat features and functions identified within the Study Area. Habitat parameters investigated included:

1. general channel dimension and flow under spring and summer flow conditions;
2. morphology mapping;
3. substrate characterization;
4. aquatic macrophyte inventory;
5. bank stability and cover;
6. areas of critical habitat (spawning, nursery, feeding);
7. presence of fish barriers and system connectivity; and,
8. potential enhancement opportunities.

4.3.2.2 Fish Collection

Fish collections were completed in the Study Area as existing data were considered incomplete. SLR sampled available habitat within the study limits. Due to the lack of surface water features in the ravines and lack of connectivity, SLR fisheries biologists did not conduct fish collection surveys in the ravines as part of this project.

The water features were sampled after obtaining a Scientific Collector's License from MNRF Midhurst District, (License No. 1068519). A Smith-Root Model 12 Electrofishing backpack (Pulsed DC setting 200-300 V, 50-60 Hz, 4-6 ms) was used for fish collections. Fish sampling was performed in all available microhabitat types through each selected reach to ensure the collection of a representative fish community sample, in accordance with Electrofishing Guidelines and Procedures (MNRF 2008). Upon completion of sampling, collected fish were identified and numerated by species, and returned live to the watercourse.

4.3.2.3 Benthic Invertebrate Community

Benthic invertebrates are considered effective indicators of freshwater ecosystem conditions because they have limited mobility and are therefore constantly exposed to the effects of pollution. In addition, benthic invertebrate communities are well-documented aquatic ecological indicators with various tolerance levels.

The Study Area was sampled according to the Ontario Benthos Biomonitoring Network: Protocol Manual, using a Transect Kick Method. Representative reaches were selected as sampling locations to target functionality of the system (pools, riffles, fast/shallow and slow/deep habitat types).

A variety of metrics were calculated from the data including richness, diversity, dominance and *Ephemeroptera*, *Plecoptera* and *Trichoptera* (EPT) richness. EPT richness is a count of

Ephemeroptera, *Plecoptera* and *Trichoptera* species in a sample and is commonly interpreted as a sensitive indicator of water quality because the majority of these species do not proliferate in degraded conditions.

4.3.2.4 *Instream Barrier Assessment*

Fish require access to suitable habitat types to carry out life history functions such as spawning, rearing young and adult growth. Barriers that create discontinuities in flow or prevent upstream and downstream passage can negatively influence the movement of species, and ultimately affect the structure of aquatic ecosystems through reduced genetic diversification.

A survey was conducted on April 7, 2015 to identify potential natural or man-made instream barriers that have the potential to affect water flow and fish movement. The survey was conducted in accordance with the Ontario Stream Assessment Protocol – Module 9 Instream Crossing and Barrier Attribution. The survey was completed throughout the study area and downstream of the study area, outside of the project boundary. The survey was completed during freshet, and results reflect relatively high flow conditions.

5.0 EXISTING CONDITIONS

Secondary source information verified by field investigations, including terrain and hydrogeology was integrated to develop a functional assessment of natural environment conditions on the property.

5.1 General Physiology and Geology

The site lies below the buried Niagara Escarpment and drains from the southwest to northeast falling approximately 45 m in this direction. The Nipissing Ridge diagonally transects the site in a northwest to southeast orientation. It is incised by a network of steep ravines, draining water to the north east and ultimately to Georgian Bay. The bluff varies in height between approximately 10 m to 20 m across the ridge. Two streams (unnamed water features) flow across the property and cascade over the ridge through separate ravines. The larger of the two streams (Water Feature A) enters the site from its western side via a culvert under Helen Street. The stream is then conveyed by a manmade channel which turns eastward approximately 200m north of Helen Street. During periods of relatively low flow, for example during summer, the water is conveyed by several small but well defined, anastomosed channels. During higher flows water from the constructed channels overflow onto the surrounding fields and follow several routes toward the Nipissing Ridge before cascading down through several ravines (See Figure 3). These routes may reflect historic drainage; they flow intermittently. Flow from the ravines collects in a well-defined channel along the toe of the ridge and flows off the site to the north. Much of the wetland thicket habitat and groundwater seeps are in close proximity to this water course. A sandy layer at the toe of the ridge supports seeps with groundwater plant indicators. This layer is thought to be hydrologically unconnected to sand lenses in the overburden above the ridge and receives groundwater which has infiltrated on the ridge slope.

Geologically the site lies less than a kilometre below the Niagara Escarpment. Uphill of the Nipissing Ridge, the underlying bedrock is likely Upper Ordovician age limestones of the Georgian Bay Formation. Coincident with the ridge position there is a transition to softer and more readily weathered shales of the Blue Mountain Formation (OGS, 2015). Boreholes drilled by Terraprobe in 2011 indicated that above the ridge, bedrock is overlain by several metres of dense, sandy silt glacial till with occasional sandy seams (one borehole drilled by Terraprobe

found probable bedrock at 16.5 m). These more hydraulically conductive streams likely feed the observed seeps and groundwater fed plant communities (i.e. watercress) above the ridge. Terraprobe advanced three (3) boreholes below the ridge at the east side of the site and encountered sands and gravels conducive with near-shore lacustrine deposits. In these boreholes bedrock was encountered 1.2 m to 5.2 m below grade.

The soils above the ridge are dense, fine grained and generally of low permeability. Permeability testing conducted by SLR in 2013 indicated that the till had hydraulic conductivities between 6.0×10^{-7} m/s and 6.0×10^{-8} m/s. The water table is generally close to the surface and was observed to seasonally fluctuate from 0.5 m to 1.3 m below ground surface.

5.2 Terrestrial Resources

5.2.1 Vegetation

There are 22 distinct vegetation communities, classified according to ELC (Internal MNRF methodology, 2008). Generally, most communities are young thickets in the west and more mature forest in the east of the Study Area. The soil on the plateau section of the Study Area is a fine-grained clay and silt.

Terrestrial ecosystems are summarized in four broad categories: Upland Forest, Wetland, Thickets and Woodlands, and Meadow / Disturbed Areas (Table 5-1 and Figure 3). The upland forest comprises 20 ha of the Study Area, largely located in the eastern section of the Study Area, on the slopes of the Nipissing Ridge. These mid-age to mature forests are the least disturbed ecosystems in the Study Area. They vary in composition, but are largely comprise hardwood species in common southern Ontario assemblages on dry-fresh soil: Sugar Maple (*Acer saccharum*), Beech (*Fagus grandifolia*), Green Ash (*Fraxinus pennsylvanica*), and Red Oak (*Quercus rubra*).

Wetland communities comprise 7 ha of the Study Area, located largely in the west and dominated by thicket swamps. Small openings of shallow and meadow marsh also occur providing a diversity of habitats. These very moist features have a mineral soil and are comprised of a relatively large area of Red-osier Dogwood (*Cornus stolonifera*) Mineral Deciduous Thicket Swamp (SWTM2-1) with associated Manitoba Maple (*Acer negundo*) Swamp and Reed Canary (*Phalaris arundinacea*) Meadow Marsh.

Upland Thickets and woodlands, although different in composition, are largely the result of relatively recent disturbance in the form of historical farming. Thickets and woodlands comprise 25 ha of the Study Area. The individual community with the largest area is Dry-Fresh Deciduous Shrub Thicket (THDM2). This young thicket runs in a northwest/southeast direction in the eastern portion of the Study Area.

Meadows and Disturbed Areas comprise 6 ha of the Study Area. Meadows are recently disturbed areas comprised of early successional species and Disturbed Areas are areas not dominated by vegetation.

The MEMM3 and THDM2-1 polygons in the central portion of the Study Area comprise the aforementioned Petun Plater-Marten archaeological site. This area is on a terrace of the Nipissing Ridge, which dominates the eastern portion of the Study Area. The Nipissing Ridge comprises a series of gullies, associated with historical or current drainage systems.

**Table 5-1:
ELC communities**

ELC Code	Polygon ID	ELC Description	Area (Ha)
Upland Forest			
FOCM6-1	15a	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.59
FOCM6-1	15b	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.45
FODM3-1	9a	Dry - Fresh Poplar Deciduous Forest Type	0.48
FODM3-1	9b	Dry - Fresh Poplar Deciduous Forest Type	1.29
FODM3-1	9c	Dry - Fresh Poplar Deciduous Forest Type	0.30
FODM5-10	20	Dry - Fresh Sugar Maple - Trembling Aspen Deciduous Forest	1.70
FODM5-2	21a	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.27
FODM5-2	21b	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.71
FODM5-3	13a	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	1.03
FODM5-3	13b	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	2.54
FODM5-3	13c	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	0.5
FODM5-9	5a	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	0.3
FODM5-9	5b	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	3.4
FODM6-1	17	Fresh - Moist Sugar Maple - Green Ash Deciduous Forest	1.0
FODM7-20	34	Fresh - Moist Lowland Green Ash Deciduous Forest	3.6
FODM8-1	24	Fresh - Moist Balsam Poplar - Trembling Aspen Deciduous Forest	1.3
FOMM6-1	19	Fresh - Moist Sugar Maple - White Birch - Hemlock Mixed Forest	2.4
Upland Forest Total			20.3
Wetland			
MAMM1-3	33	Reed-canary Grass Graminoid Mineral Meadow Marsh	0.2
SWD3-4	1	Manitoba Maple Mineral Deciduous Swamp	0.4
SWDM2-2	30	Green Ash Mineral Deciduous Swamp	0.3
SWTM2-1	8a	Red-osier Dogwood Mineral Deciduous Thicket Swamp	5.1
SWTM2-1	8b	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.1
SWTM2-1	8c	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.2
SWTM3	23	Willow Mineral Deciduous Thicket Swamp	1.0
Wetland Total			7.3
Thickets and Woodlands			
THCM1-20	31	Dry - Fresh Scots Pine Thicket	0.3
THDM2	2a	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.8
THDM2	2b	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.4
THDM2	2c	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.5
THDM2	2d	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	16.8

ELC Code	Polygon ID	ELC Description	Area (Ha)
THDM2-1	4	Sumach Deciduous Shrub Thicket	2.6
THDM4-1	32	Green Ash Regeneration Thicket	0.3
WOD5	14	Fresh - Moist Deciduous Woodland (Green Ash)	1.1
WODM5-1	16	Fresh - Moist Trembling Aspen - Green Ash Deciduous Woodland	1.9
Thickets and Woodlands Total			24.8
Meadow			
MEMM3	11a	Dry - Fresh Mixed Meadow	2.2
MEMM3	11b	Dry - Fresh Mixed Meadow	0.4
MEMM3	11c	Dry - Fresh Mixed Meadow	0.8
Meadow Total			3.4
Disturbed Area			
DIS		Disturbed Area	1.5
DIS		Disturbed Area	0.9
Disturbed Area Total			9.2

5.2.2 ELC Polygon Descriptions

1 – Manitoba Maple Mineral Deciduous Swamp (SWD3-4)

This swamp wetland is heavily dominated by non-native Manitoba Maple (*Acer negundo*), with a lesser amount of White Willow (*Salix alba*) and American Elm (*Ulmus americana*). The understory consists of Hawthorn species (*Crataegus sp.*) with a ground layer of Field Horsetail (*Equisetum arvense*) and Poison Ivy (*Toxicodendron radicans*).

2 – Dry-Fresh Deciduous Shrub Thicket (THDM2)

These polygons comprise a low cover of Green Ash (*Fraxinus pennsylvanica*) in the overstory. The dominant species are in the thicket sub-canopy, dominated by Common Apple (*Malus pumila*), and Hawthorn Species. A thick layer of Red-osier Dogwood (*Cornus stolonifera*) in the shrub layer covers the following dominant ground layer species: Narrow-leaf Goldenrod (*Euthamia graminifolia*) and Poison Ivy.

There is a seep (Seep_5) in the northwestern corner of this polygon 2d where water was observed coming from the ground. Three patches of Watercress (*Nasturtium officinale*), a groundwater indicator, were also observed in the central portion (NASOFFI_3), and southern portion (NASOFFI_1, NASOFFI_4) of this polygon. Although this polygon is a dry environment, the groundwater indicators are close to and surrounding the SWTM2-1 (a thicket swamp) found in this area.

4 - Sumac Deciduous Shrub Thicket (THDM2-1)

This young thicket area is on a terrace adjacent to the steep valley slope in the northeast of the Study Area. The thicket is heavily dominated by Staghorn Sumac (*Rhus typhina*). This thicket area has a low species diversity, with the ground layer comprising grasses and early successional species: Smooth Brome (*Bromus inermis*), Wild Carrot (*Daucus carota*), and Riverbank Grape (*Vitis riparia*).

5 - Dry – Fresh Sugar Maple – Hardwood Deciduous Forest (FODM5-9)

This upland deciduous forest is on the steep valley slope with a northeastern aspect. It is dominated by Sugar Maple (*Acer saccharum*) with lesser amounts of Red Oak (*Quercus rubra*) and Beech (*Fagus grandifolia*). There is an understory of Ironwood (*Ostrya virginiana*). The shrub layer comprises sparse Zig-zag Goldenrod (*Solidago flexicaulis*) and the ground layer comprises Yellow Trout Lily (*Erythronium americanum*) with small amounts of White Trillium (*Trillium ovatum*). This is a common association of species in tolerant hardwood stands.

In polygon 5b, two Butternuts (*Juglans cinerea*) (JUGCINE_28 and JUGCINE_29), a species at risk, are present along a northern-facing slope. See Section 5.2.7 for further discussion of this species.

8 – Red-osier Dogwood Mineral Deciduous Thicket Swamp (SWTM2-1)

These wetland thickets have a sparse overstory of Green Ash with a somewhat sparse understory of Red-osier Dogwood, Silky Dogwood (*Cornus amomum*), and Nannyberry (*Virburnum lentago*). This wetland environment has a relatively dense understory comprised of Devil's Beggarticks (*Bidens frondosa*), Cut Grass (*Leersia oryzoides*), Redtop (*Agrostis gigantea*), and Marsh Bedstraw (*Galium palustre*).

Watercress, a groundwater indicator was observed in the middle of this thicket swamp. The wetland is supplied, in part, by groundwater inputs.

9 – Dry-Fresh Poplar Deciduous Forest Type (FODM3-1)

Two of these upland forest polygons are at the upper edges of the valley slope. These pioneer forests are dominated by young Trembling Aspen with a sparse understory of Green Ash, Hawthorn Species, Common Apple, and the invasive Common Buckthorn (*Rhamnus cathartica*). The understory comprises Green Ash seedlings and Poison Ivy.

In polygon 9b, a Butternut (JUGCINE_1), a species at risk, is present along an eastern facing slope in a narrow valley. See Section 5.2.7 for further discussion of this species.

11 – Dry-Fresh Mixed Meadow (MEMM3)

There are three areas of this pioneer community, the largest being on the terrace in the northeast of the Study Area. There is a sparse cover of Hawthorn species in this open area dominated by cool season grasses, Brome Grass, and Common Milkweed (*Asclepias syriaca*).

The meadow in the eastern portion of the Study Area (polygon 11a) has a sparse cover of Round-leaf Dogwood (*Cornus rugosa*) and a ground layer of common meadow species: Canada

Goldenrod (*Solidago canadensis*), Wild Carrot, Cool Season Grasses, and Bird-foot Trefoil (*Lotus corniculatus*).

13 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest (FODM5-3)

These dry deciduous forests are found on steep sections of the valley slope. The forest is dominated by an overstory of Sugar Maple and Red Oak. There are several large individuals of both these species present. The sparse and open understory comprises Ironwood and White Birch (*Betula papyrifera*) while the similarly sparse shrub layer comprises White Ash (*Fraxinus americana*) and Ironwood. The ground layer is heavily dominated by Zig-zag Goldenrod.

Five individual Butternuts, a species at risk, are present in 13b (JUGCINE_2, JUGCINE_13, JUGCINE_12, JUGCINE_32, and JUGCINE_31). See Section 5.2.7 for further discussion regarding these species.

Two seeps (seep_4 and seep_3) are present at the toe of the eastern facing slope in Polygon 13b. Rough Sedge (*Carex scabrata*), a groundwater indicator, was observed along the slope and at the toe of the slope near the seeps.

14 – Fresh-Moist Deciduous Woodland (Green Ash) (WOD5)

This area of relatively open canopy of Green Ash is along the southern property boundary in the far western portion of the Study Area. The open canopy of Green Ash is over a similarly open understory of Hawthorn species and Common Apple. The shrub layer comprises relatively tall grasses: Smooth Brome, Kentucky Blue Grass (*Poa pratensis*), and White Sweet Clover (*Melilotus alba*), a common early successional species. The ground layer includes Field or Common Mint.

15 – Dry-Fresh White Pine Naturalized Coniferous Plantation (FOCM6-1)

This small linear polygon is along the slope of the eastern facing valley slope in the mid-eastern portion of the Study Area. This forest is an old Eastern White Pine plantation that has been left unmanaged and is beginning to naturalize. As in many plantations, structural diversity and biodiversity is relatively low. The canopy comprises the planted White Pine and the ground layer comprises Field or Common Mint (*Mentha arvensis*), Smooth Brome, and Poison Ivy.

In polygon 15a, three Butternuts (JUGCINE_14, JUGCINE_15, and JUGCINE_16), a species at risk, are present along a northern western-facing slope. See Section 5.2.7 for further discussion of this species.

16 – Fresh-Moist Trembling Aspen – Green Ash Deciduous Woodland (WODM5-1)

This open woodland is on the eastern facing valley slope in the mid-eastern section of the Study Area, through which a stream runs. This moderately moist area comprises a relatively sparse overstory of Green Ash with small amounts of White Birch. The understory, which has a relatively similar canopy cover to the overstory, comprises Hawthorn species with small amounts of Jack Pine (*Pinus sylvestris*). The shrub layer is entirely dominated by Round-leaved Dogwood. The ground layer comprises Smooth Brome and Wild Carrot.

17 – Fresh-Moist Sugar Maple – Green Ash Deciduous Forest (FODM6-1)

This mid-age forest is on the eastern-facing valley slope. It is dominated by Sugar Maple and lesser amounts of Green Ash and White Birch. The sparse understory is composed of Green Ash and Riverbank Grape. The relatively sparse shrub layer comprises Common Raspberry, while the very sparse ground layer is dominated by Wild Ginger (*Asarum canadense*). There is a moist drainage through the centre of the polygon that has an open canopy, comprises Helleborine (*Epipactis helleborine*) and Jewelweed (*Impatiens capensis*), two common riparian plants adapted to wet conditions.

19 – Fresh-Moist Sugar Maple – White Birch – Hemlock Mixed Forest (FOMM6-1)

This mature mixed forest is entirely on the valley slope, extending in a horseshoe shape along the slope. The overstory has a high cover of Sugar Maple, White Birch, and Eastern Hemlock (*Tsuga canadensis*) with a sparse understory of Green Ash. The shrub layer is relatively open and comprises Green Ash saplings and Marginal Wood Fern (*Dryopteris marginalis*). The ground layer is also sparse, and comprises Canada Mayflower (*Maianthemum canadense*), Poison Ivy, and Tussock Sedge (*Carex stricta*). This mature forest is one of the least disturbed areas in the Study Area and largely comprises late successional species.

20 – Dry-Fresh Sugar Maple – Trembling Aspen Deciduous Forest (FODM5-10)

This young forest is on a plateau between ridges of the steep eastern facing slope in the eastern section of the Study Area. The overstory comprises a high cover of young Sugar Maple and Trembling Aspen, with an understory of Sugar Maple. The very sparse shrub layer comprises White Ash and the ground layer comprises includes Poison Ivy.

21 – Dry-Fresh Sugar Maple – Beech Deciduous Forest (FODM5-2)

This mature forest is adjacent to polygon 20. It is a high quality forest with good structure, low presence of invasive species, and a thick duff layer. The overstory comprises Sugar Maple, American Beech, and Red Oak with an understory of American Beech. The shrub layer comprises young Ironwood. The ground layer comprises Nodding Fescue (*Festuca obtusa*), Bottle Brush Grass, White Baneberry (*Actaea pachypoda*) (a rich site indicator), and Pennsylvania Sedge (*Carex pennsylvanica*).

23 – Willow Mineral Deciduous Thicket Swamp (SWTM3)

This wetland thicket is located in the southeastern portion of the Study Area. There is a sparse overstory of Bebb's Willow (*Salix bebbiana*). The understory comprises Black Bulrush (*Scirpus atrovirens*) and Narrow-leaved Cattail (*Typha angustifolia*). The shrub layer comprises Tall Manna Grass (*Glyceria grandis*), Redtop, with small amounts of Red-osier Dogwood. The ground layer is dominated by Jewelweed.

Two Butternuts (JUGCINE_17 and JUGCINE_18), a species at risk, are present along the edges of the thicket swamp. See Section 5.2.7 for further discussion of this species.

24 – Fresh-Moist Balsam Poplar – Trembling Aspen Deciduous Forest (FODM8-1)

This moist area is in the southeast corner of the Study Area at the toe of an eastern facing slope. It is lacking in biodiversity and is dominated by Trembling Aspen and Balsam Poplar (*Populus balsamifera*), with an understory of Green Ash.

30 – Green Ash Mineral Deciduous Swamp (SWDM2-2)

This wetland polygon is in a low-lying area in the eastern section of the Study Area. It intersects a stream and is dominated by Green Ash and Sugar Maple with a mottled mineral soil.

Five Butternuts (JUGCINE_22, JUGCINE_23, JUGCINE_24, JUGCINE_25 and JUGCINE_27), a species at risk, are present along the border of the swamp. See Section 5.2.7 for further discussion of this species.

31 – Dry-Fresh Scots Pine Thicket (THCM 1-20)

This small recently disturbed area is in the northwestern section of the Study Area. This upland thicket comprises young Scots Pine with an equal amount of Round-leaf Dogwood and Hawthorn species.

32 – Green Ash Regeneration Thicket (THDM4-1)

This small area was recently disturbed and is regenerating solely in Green Ash. This was likely a part of polygon 34 that was disturbed and was stocked with advanced regeneration of this species.

33 – Reed-canary Grass Graminoid Mineral Meadow Marsh (MAMM1-3)

This small wetland polygon is in the southwest corner of the Study Area. It is entirely dominated by Reed-canary Grass (*Phalaris arundinacea*)

34 – Fresh – Moist Lowland Green Ash Deciduous Forest (FODM7-20)

This lowland polygon is in the northeast of the Study Area and comprises Green Ash. There is an understory of Red-osier Dogwood. The ground layer is dominated by Hog Peanut (*Amphicarpaea bracteata*).

Four Butternuts (JUGCINE_20, JUGCINE_21, JUGCINE_19 and JUGCINE_26), a species at risk, are present. See section 5.2.7 for further discussion of this species.

5.2.3 Flora

The field investigation identified 201 species of plants within the Study Area (for complete species lists see Appendix B). A total of 60 species are non-native, representing approximately 30% of the total number of species documented. This percentage of non-native species is average in southern Ontario. Species at Risk and rare species are described below in section 5.17.

As discussed above seepage was observed in two polygons: Polygon 2d (Dry-Fresh Deciduous Shrub Thicket – THDM2), and polygon 13 (Dry-Fresh Sugar Maple-Red Oak Deciduous Forest) and

Groundwater indicators were observed in four polygons: Polygon 2d, Dry – Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple – THDM2), Polygon 8 (Red-osier Dogwood Mineral Deciduous Thicket Swamp – SWTM2-1), and Polygon 13b (Dry-Fresh Sugar Maple – Red Oak Deciduous Forest - FODM5-3). Some of the seeps and groundwater indicators are at the toe of the slope at the bottom of the Nipissing Ridge and some are on the plateau to the ridge.

5.2.4 Breeding Birds

Breeding bird surveys resulted in forty different species observed. For a complete list of birds, please see Appendix C. The most commonly observed species were American Goldfinch (*Cardeulis tristis*), Song Sparrow (*Melospiza melodia*), Red-eyed Vireo (*Vireo olivaceus*), and Black-capped Chickadee (*Poecile atricapillus*). This assemblage of bird species is common in southern Ontario.

Twenty of the forty bird species noted are confirmed breeders in the Study Area. The most bird activity was located at Point 1, in the southwest of the Study Area on the border of a shrub thicket and a Red-osier Dogwood Thicket Swamp (refer to Figure 3).

The Eastern Wood Pewee (*Contopus virens*), a species of Special Concern in Ontario, was identified at point locations 3, 4, and 6, of which, breeding was confirmed only at point 4. Please see Section 5.2.7 for more information about this species.

Six area sensitive species were observed (Table 5-2). All these species are adapted to forested habitats of variable composition. Of these species, only one is a confirmed breeder: American Redstart (*Setophaga ruticilla*). The American Redstart is adapted to open forested habitats.

**Table 5-2:
Area Sensitive Bird Species**

Common Name	Scientific Name	Confirmation of Breeding*	Location and Habitat
American Redstart	<i>Setophaga ruticilla</i>	Yes	Point 5 On the border of a thicket swamp and a meadow at the bottom of the Nipissing Ridge
Black-throated Green Warbler	<i>Dendroica virens</i>		
Hairy Woodpecker	<i>Picoides villosus</i>		
Veery	<i>Catharus fuscescens</i>		
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>		
Yellow-throated Vireo	<i>Vireo flavifrons</i>		

* Confirmation of breeding is defined as a species being noted on each of the two surveys.

5.2.5 Amphibians

No calling amphibians were noted during amphibian surveys in the Study Area. Calls recorded upstream and downstream of the property identified several species in good numbers. It

appears that the subject land has low suitability for amphibian habitat. Incidentally, three individuals were observed during vegetation surveys (Figure 3): Gray Treefrog (*Hyla versicolor*), Northern Leopard Frog (*Lithobates pipiens*), and American Toad (*Anaxyrus americanus*) (Figure 3).

5.2.6 Seeps

Groundwater seepage areas are often ecologically important as they provide continuous cool water, especially at times when water and / or cool water may not be available. Two isolated seeps were observed in the northeastern section of the Study Area (Figure 3). Rough Sedge (*Carex scabrata*), a plant indicative of groundwater conditions is associated with the two seeps in the northeast part of the Study Area (Figure 3). In the southwest portion of the Study Area, Water Cress (*Nasturtium officinale*), another groundwater indicator was observed in four locations.

5.2.7 Species at Risk and Rare Species

Twenty two Butternut individuals were noted within the Study Area. The Butternut is listed as Endangered under the *Endangered Species Act*, 2007. For a list of all Butternuts and their attributes, see Appendix D. Locations of all Butternuts are shown on Figure 3. Most Butternuts appear to be relatively healthy with minimal sooty spots (as a result of Butternut Canker). Diameters range between 5 cm and over 150 cm.

The Eastern Wood Pewee (*Contopus virens*), a species of Special Concern in Ontario was identified at point locations 3, 4, and 6, of which, breeding was confirmed only at point 4 within the mature slope forest (Appendix C and Figure 3). It was heard in a variety of habitats, once in each of a Poplar-dominated forest (Polygon 9c, Survey Point 6) and Trembling Aspen – Green Ash Woodland (Polygon 16, Survey Point 3).

The confirmed breeding location is at Survey Point 4, located in the eastern portion of the Study Area, on a plateau tableland of the Nipissing Ridge. The habitat is classified as a Dry-Fresh Sugar Maple – Trembling Aspen Deciduous Forest (FODM5-10). The overstory comprises a high cover of young Sugar Maple and Trembling Aspen, with an understory of Sugar Maple. The very sparse shrub layer includes White Ash and the ground layer comprises Poison Ivy.

The Eastern Wood Pewee is a flycatcher that, although ubiquitous in southern Ontario, has been declining in population. This species is adapted to a wide variety of habitats, including forest clearings, edges, and woodlands.

Section 4.2.1 above notes the Species at Risk, of Conservation Concern, or that are rare that have the possibility of being present in the Study Area according to MNR communication. Of these species, only Butternut was observed. Habitat for other species is either not present, or is present but the species was not observed. It is important to note that habitat for Barn Swallow habitat may be present in old structures present on site, an inspection for which is recommended in Section 8.0. Poor to moderate habitat for Variegated Meadowhawk is present. None were observed incidentally (Table 5-3).

**Table 5-3:
Applicability of Study Area to Species at Risk, Conservation Concern, and Rare species**

Common Name	Scientific Name	SARO / NHIC Rank	Applicability of Study Area to Species
Butternut	<i>Juglans Cinerea</i>	Endangered	22 individuals present
Northern Myotis	<i>Myotis septentrionalis</i>	Endangered	No habitat present (caves and mine adits)
Barn Swallow	<i>Hirundo rustica</i>	Threatened	Potential habitat in old structures None observed.
Milksnake	<i>Lampropeltis triangulum</i>	Special Concern	Habitat is largely too wet for hibernacula. None observed.
Canada Warbler	<i>Wilsonia canadensis</i>	Special Concern	Possible habitat present (moist mixed forests). None observed.
Stiff Yellow Flax	<i>Linum medium var. medium</i>	S3?	Possible habitat present (wet woods). None observed.
Variegated Meadowhawk	<i>Sympetrum corruptum</i>	S3	Poor-moderate habitat present. (Slow moving water: shallow open or marshy lakes, slow streams with sandy of cobble bottoms, and ponds). None observed incidentally
Snapping Turtle	<i>Chelydra serpentina</i>	SC	Habitat poor. Wetlands with mineral soil that largely dry up in summer (deep ponds rare). None observed.

5.2.8 Landscape Connectivity

Existing vegetation units in southern Ontario have been highly fragmented by agricultural land, residential subdivisions, commercial and industrial activities and roads. Fragmentation results in the reduction of total habitat available, and the isolation of remaining patches. Retaining connections among the remaining vegetation units can protect the features and functions of remaining communities and minimize negative impacts associated with habitat fragmentation.

The site is located in a developed area of Blue Mountains (Figure 4). The developments are parallel to the ski hills of Blue Mountain, largely to the west and south of the Study Area. To the east of the Study Area, there is forest cover extending approximately 1.5 km to Long Point Road. To the north of the Study Area, there is a strip of forest from the eastern forest running northwest – southeast to Happy Valley Road. This feature is approximately 60 m wide at its most narrow point.

The Nipissing Ridge, running northwest-southeast through the central-eastern section of the Study Area is an area of landscape connectivity. As the ridge is largely undeveloped and forested, it acts as a corridor, connecting habitat to the north and south of the Study Area. The thicket areas to the west of the ridge, although not as mature of a habitat as the forest along the ridge, add width to the corridor. The forest associated with the ridge can clearly be seen as the dark vegetation in Figure 4.

Some species utilize corridors associated with watercourses, waterbodies, and wetlands. The streams, providing a corridor for movement linked to the Nipissing Ridge in the Study Area provide connectivity for wildlife species.

5.2.9 Significance and Sensitivity

There are no rare or uncommon vegetation units within the subject lands (NHIC, 2014). Significant features include: Butternut (Species at Risk), Mid-age to Mature Forest focused along the Nipissing Ridge primarily in the eastern section of the Study Area, seeps and groundwater indicators, wetlands, habitat for Eastern Wood Pewee (Species of Conservation Concern) and American Redstart (Area sensitive breeding bird), and habitat connectivity provided by the Nipissing Ridge.

The vegetation and habitat in the western section of the Study Area is largely thicket habitat resulting from disturbance which is of lower ecological value than the eastern mid-age to mature forest.

Each of the significant features are described in respective sections above, are summarized in Table 5-4 below and are shown on Figure 3. These significant features form the basis of assessment for the impacts and mitigation section of this report, Section 8.0.

5.2.9.1 Significant Wildlife Habitat

A screening was undertaken using criteria developed by OMNRF (Appendix E). The candidate SWH for which there is evidence of occurrence on the Home Farm lands, and that meets the test for significance identified in the Criteria for Ecoregion 6E includes:

- Area Sensitive Breeding Birds: Woodland
- Endangered Species Act Special Concern

- Amphibian Corridors

5.2.9.2 Summary

Table 5-4 provides a list of the reasons why the features listed are of importance, and to which the mitigation hierarchy will apply (*i.e.*, avoid, redesign, mitigate or compensate).

**Table 5-4:
Significance and Sensitivity Summary.**

Category	Feature/Function	Attributes
Vegetation	Butternut (Species at Risk)	<ul style="list-style-type: none"> • 22 individuals mostly located at the bottom of the Nipissing Ridge in the eastern portion of the Study Area
	Mid-age to Mature Forest	<ul style="list-style-type: none"> • Deciduous forest in the eastern portion of the Study Area generally has a healthy structure, low presence of invasive species, and species associations typical of southern Ontario
	Groundwater Indicators and seepages	<ul style="list-style-type: none"> • Sources of groundwater discharge
	Wetlands	<ul style="list-style-type: none"> • Thicket Swamps in eastern portion of Study Area
Wildlife	Area Sensitive Breeding Birds	<ul style="list-style-type: none"> • American Redstart, adapted to open forests, observed adjacent to thicket swamp and meadow habitat
	Eastern Wood Pewee	<ul style="list-style-type: none"> • Species of Conservation Concern, observed in a variety of habitats.
	Amphibian corridor	<ul style="list-style-type: none"> • Connects upstream and downstream breeding habitat
Landscape Connectivity	Nipissing Ridge	<ul style="list-style-type: none"> • Ridge acts as a northwest – southeast corridor for wildlife and plant species movement. • Watercourses link areas of movement to the Nipissing Ridge

5.3 Aquatic Environment

The Study Area is located within the Southwest Georgian Bay watershed, and situated north of Indian Brook subwatershed. Permanent and intermittent unnamed watercourses occur on the project site. The features comprise a network that flows north to northeast and ultimately outlets into Georgian Bay.

Upstream fish passage from Georgian Bay into the Study Area is limited due to intermittent flows and steep ravines that contain step-pool channel morphology and steep gradients which create barriers to fish passage. The steep landforms serve as a barrier to upstream migration for fish that may enter the downstream reaches of the watercourses. Additionally, unnatural barriers, such as perched road culverts, fragment the habitat downstream of the study area.

Data collected in the desktop analysis and the fall field investigations are used to provide a description of the fish and fish habitat within the Study Area. The fish and fish habitat in the Study Area is discussed in two main sections which focus on potential impacts associated with the proposed development. Habitat descriptions are discussed below under headings; 1)

Ravine and 2) Water Feature. Included in this discussion is a description of aquatic vegetation, water depth, substrate composition, and riparian areas observed during investigations.

5.3.1 Ravine

Three ravines were identified within the Study Area. For the purpose of this report, a ravine is defined as a small narrow steep-sided valley that is larger than a gully and smaller than a canyon and that is usually worn by running water (NALMS 2014).

The West Ravine occurs at the north west side of the Study Area and comprises two intermittent channels that confluence at the northern extent of the Study Area (Figure 5). The most western channel was dry during summer conditions. In the main channel, shallow isolated pools of water were observed and the valley floor was saturated. No indicators of possible groundwater input (iron staining, water cress) were identified. At the upstream extent of the channel, flow was observed and dense jewelweed existed in the riparian area. At the confluence of the two channels, flow was observed and continued to flow northward outside of the Study Area. Substrate composition was primarily small gravel and rubble.

The Centre Ravine comprises two channels. Channel 1 was dry during summer investigations and substrate composition was dominated by gravel, cobble, broken shale with smaller portions of sand. Channel 2 contained flowing water and had a wetted width approximately 1.5 m. Substrate composition was primarily boulder, cobble and gravel. Instream cover is provided by dense deciduous canopy and woody debris throughout the channel.

The East Ravine is situated within a deep channel vegetated with Hemlock, Fir, Ferns and little understory growth. Three ravines exist at the eastern extent of the Study Area (Figure 5). In all three channels, flow was minimal; soils were saturated but aquatic habitat was dominated by isolated pools that do not support fish. Substrates included organics, silt and gravel. As a result of the tree canopy cover, the channel receives a moderate amount of shade.

Within the West, Centre, and East Ravine areas, habitat and flow diversity is considered low and minimal in-stream cover exists. In addition, the ravine areas comprised simple channel morphology with little to no riffle, pool, or run sequencing. The steep landforms serve as a barrier to upstream migration for fish that may enter the downstream reaches of the watercourses.

5.3.2 Watercourses

Water Feature A provides the majority of flow through the Study Area. This channel enters the Study Area in the southwest in a single channel and flows east through the Study Area. Top of bank channel width is approximately 4 m. In summer wetted width was 1.5 m, average water depth in the thalweg was 0.10 m, and flow was approximately 8.9 L/s. In spring wetted width was 2.8 m, water depth in the thalweg was approximately 0.20 m, and flow was measured at 107 L/s. Riffle and pool sequencing was observed throughout the reach. Riffle and pool habitat typically ranged from 1.15 to 1.7 m wide and 0.14 to 0.23 m deep. Substrate was dominated by silt, gravel and cobble (round and flat). Deposition of silt was observed, and most pronounced immediately upstream from beaver dam. Riparian vegetation primarily consists of Dogwood, and ephemeral grasses and shrubs. Evidence for



inundated floodplain appeared to extend approximately 1-2 m beyond the wetted width during spring flow, indicating that the channel conveys a greater volume during peak events.

The channel is braided due to beaver activity and the creation of a low-head beaver dam (approximately 0.5 m in height). This activity has created a large wet area and dispersed flow in a low gradient upstream area. Between 2010 and 2014 water flow downstream has been observed in two different channels. In 2011 flow was observed flowing northward from the beaver impoundment for approximately 150 m and then flowing eastward in a channel approximately parallel to Water Feature A (Figure 5). Flow was not observed in Water Feature A at that time. In 2001 (Figure 3 in ESG 2002), 2012 and 2014 flow was observed in Water Feature A and not in the channel north of Water Feature A. These observations indicate temporal and spatial variability in flow downstream from the beaver impoundment.



Downstream from this beaver dam flow separates into two main channels in 2012 and 2014 (Water Feature A and B) and several minor and potentially historic channels, at least one of which flows through breaches in the banks of Water Feature C, (Appendix G) prior to cascading into the centre ravine. The separation of flow among Water Features A, B, C and the minor features effectively increases the amount of intermittent aquatic habitat and reduces the collective fish habitat value of the system compared to what would be observed if the flow was concentrated in one channel.

Mean channel wetted width of Water Feature B was similar to Water Feature A; approximately 1.5 m. Substrate was dominated by rubble, gravel and silt. Fish habitat was observed in the upstream portion of the feature. Upstream fish passage is restricted through the ravines.

Water Feature C was narrower and conveyed less flow than Features A and B. Feature C had a top of bank channel width is approximately 2.5 to 3 m and the feature had an average water depth of 0.15 m.

Flows in Water Feature A and B upstream of the ravine appeared approximately equal. After flowing through the centre ravines, Water Feature A and B confluence and continue flowing north east through the Study Area as one channel. No instream vegetation was noted in either water feature. Indicators of possible groundwater input (iron staining, water cress) were not noted during the aquatic field investigation and water temperatures were comparable to air temperatures (in July 2012- Table 5-5) suggesting little, if any, groundwater influence.

The substrate types, flow variations, riffle, pool, and run sequencing, and in-stream (woody debris) observed within the upstream reaches of Water Feature A and B appears suitable for both spawning and juvenile habitat for cyprinid species. In addition, this habitat also likely provides adequate habitat conditions for refuge during summer conditions due to cover provided by overhanging vegetation.

5.3.3 Fish Community

Water quality parameters were measured and recorded at the time of fish habitat field investigation. Table 5-5 provides a summary of the collected parameters for Water Feature A and B. This system provides a warm water environment, and suitable conditions for several tolerant fish species.

**Table 5-5:
Thermal Properties Collected in Water Feature A & B**

Sampling Date	Air Temperature (°C)	Water Temperature (°C)
January 2013	10	-1
April 2014	2	2
July 2012	28	25

Grey Sauble Conservation does not have a fisheries department and all fisheries studies within their jurisdiction are completed by MNRF, DFO, and consultant companies. A compiled list of fish species captured by SLR biologists from Water Feature A and B are provided below (Table 5-6). The fishing locations were selected based on watercourse connectivity and suitable habitat availability. These locations are identified on Figure 5. Due to the lack of suitable habitat in the ravines, fish surveys were not completed in these areas.

**Table 5-6:
Fish Species Noted Within Study Area**

Fish Species		Typical Habitat*
Common Name	Scientific Name	
Blacknose Dace	<i>Rhinichthys atratulus</i>	Runs and pools of clear, cool, swiftly-flowing creeks and small rivers Spawn in spring (May-June), 15-22°C; spawn over gravel substrates
Creek Chub	<i>Semotilus atromaculatus</i>	Pools of clear creeks and small rivers; rare in lakes and large rivers Spawn in spring-summer (May-July), 16-26°C; shallow riffles over gravel beds
Fathead Minnow	<i>Pimephales promelas</i>	Still waters of ponds, lakes, creeks and small rivers Spawn in spring-summer (May-August), 14-29°C; streams on underside of logs or large rocks

* Eakings, R.J., 2014. Ontario Freshwater Fishes Life History Database.

Water Feature A and B provide a modest warm water environment, and favourable conditions for several fish species. Blacknose Dace, Creek Chub and Fathead Minnow were collected during sampling programs. These species reflect a typical southern Ontario warm water fish community, and are relatively tolerant of stresses associated with urbanization and other physical disturbances.

Creek Chub was the dominant species and is likely the top predator (part piscivore) and feeds on other generalist minnows; Fathead Minnow and Blacknose Dace. Creek Chub spawns in spring / summer, typically over gravel substrates. Fathead Minnow is a generalist species that spawns in spring / summer and typically spawns on the underside of logs or large rocks. Blacknose Dace is a cool water species that prefers run and pool habitat, and usually spawns over gravel substrates. The habitat observed within the upstream reaches of Water Feature A and B appears suitable for both spawning and juvenile habitat for cyprinid species. The downstream reaches do not appear appropriate for functions such as spawning, due to intermittent flows and lack of substrate diversity.

5.3.4 Fish Species at Risk

Within the Southwest Georgian Bay Watershed, SAR occurrences are documented and reported in the Assessment Report for the Grey Sauble Source Protection Area (2011). Species documented in this report include: Redside Dace, Shortnose Cisco, Lake Sturgeon and Northern Brook Lamprey. Occurrences of Rainbow Mussel are also noted within the watershed.

Both NHIC and DFO's Distribution of Fish Species at Risk mapping (2014) indicate that the aquatic habitat through the Study Area does not contain these species. Furthermore, field investigations confirmed that the watercourses within the Study Area do not contain habitat suitable for SAR species listed in Table 5-7, that connectivity to potentially suitable habitat is tenuous, and no historical occurrences are recorded.

**Table 5-7:
Fish Species Habitat Requirements**

Fish Species		Status	Typical Habitat *
Common Name	Scientific Name		
Redside Dace	<i>Clinostomus elongatus</i>	Endangered	Pools and slow-moving sections of relatively small (<10 m width), clear, cool, streams with sand or gravel bottoms , riffle/pool habitat and overhanging vegetation; preferred water temperature range 14-23°C Spawn in May – June (16-19°C) in riverine habitat
Shortnose Cisco	<i>Coregonus reighardi</i>	Endangered	Clear, deep waters (11-164 m), usually 55-110 m, at water temperatures of 2-10°C Spawn in April – June (4-5°C) in lacustrine habitat
Lake Sturgeon	<i>Acipenser fulvescens</i>	Threatened / Special Concern	Bottoms of lakes and large rivers, usually 5 to 10 m deep, over clay, mud, sand and gravel; preferred water temperature range 15-17°C

Fish Species		Status	Typical Habitat *
Common Name	Scientific Name		
			Spawn in May – June (11-18°C) in lacustrine or riverine
Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	Special Concern	Adults in clean, clear riffles and runs of small rivers with gravel and sand substrates; ammocoetes occupy quiet water with sand, silt and detritus substrates Spawn in May – June (13-19° C) in riverine habitat
Rainbow Mussel	<i>Villosa iris</i>	Endangered	Shallow, well-oxygenated reaches of small- to medium-sized rivers, and sometimes lakes, on substrates (bottoms) of cobble, gravel, sand and occasionally mud. Spawning takes place in the late summer and the larvae (glochidia) are released the following spring

* Eakings, R.J., 2014. Ontario Freshwater Fishes Life History Database.

5.3.5 Instream Barriers

Several natural and man-made features were identified within and outside of the study area boundary (Appendix F). Natural barriers included cascades, rock ledges and fallen debris. Man-made barriers included a washed out bridge, perched corrugated steel and concrete box culverts for road conveyance, and drainage infrastructure.

Barriers to fish passage in watercourses can restrict movement and fragment populations within the watershed, and indirectly affect fish by influencing water quality and habitat conditions. Constrictions can cause upstream ponding and debris or sediment build-up, thereby reducing the movement of sediment downstream. Reduced sediment transport increases the capacity of flowing water to scour and erode channel banks, and ultimately decrease bank stability.

Vertical jump height and horizontal jump length was measured at each barrier. Vertical jump height ranged from 0.2 m to 1.5 m and each ravine had a horizontal jump length of at least 1 m and as great as 2 to 3 m. Swimming performance is the key factor in successful fish migration. The burst speed required to clear these features is likely unattainable for Creek Chub, Blacknose Dace and Fathead Minnow. Jumping height for Cyprinids ranges from approximately 20 to 25 cm at an adult life stage (Holthe et al. 2005) and more restrictive for juvenile and young-of-year life stages. An estimate for maximum horizontal jumps for Cyprinids is less than 0.8 m. Culvert length and grade are also considered barriers in these systems. Natural vertical jumps of greater than 25 cm were observed in each of the ravines in the study area, thus limiting fish movements in each of the study area watercourses.

Downstream of the study area, at Highway 26, a culvert inventory was completed to assess water and fish passage. Table 5-8 describes the conditions on April 7, 2015. Refer to Appendix F for culvert locations.

The results of the downstream barrier inventory suggest that water and fish passage is limited due to perched, culverts or restricted flow as a result of partial plugging (debris) inside the culverts. Each of the ravines also contained natural vertical and horizontal barriers restricting fish passage. Given the existing conditions, limited upstream and downstream fish movement is apparent from Georgian Bay into the study area.

5.3.6 Assessment of the Aquatic Environment Sensitivity

SLR has assigned sensitivity rankings to the aquatic habitat located within the study limits. A sensitivity rating of Low has been given to all water features in the Study Area (Table 5-9). The low sensitivity rankings are largely due to the low productive capacity of the area, the presence of common species, and absence of species at risk. There is no evidence of specialized habitat features or functions. Due to the sensitivity of the watercourse and thermal properties, in-water construction timing window for this area should follow the warm water timing window (July 1 – March 31) This should be confirmed with MNRF prior to the start of construction activities.

**Table 5-8:
Existing Fish and Fish Habitat Conditions Summary and Sensitivity Rankings**

Waterbody	Flow	Thermal Regime	Fish Habitat Value	Timing Window Construction Activity
West Ravine	Permanent/ Intermittent	Warm water	Low	July 1 to March 31
Central Ravine	Permanent/ Intermittent	Warm water	Low	July 1 to March 31
East Ravine	Permanent/ Intermittent	Warm water	Low	July 1 to March 31
Water Feature A	Permanent	Warm water	Low	July 1 to March 31
Water Feature B	Permanent	Warm water	Low	July 1 to March 31
Water Feature C	Intermittent	Warm water	Low	July 1 to March 31

5.3.7 Fish and Fish Habitat Summary

Table 5-10 summarizes the existing fish and fish habitat conditions observed by SLR or noted by agencies in the Study Area.

**Table 5-9:
Existing Aquatic Conditions Summary**

Waterbody	Flow	Thermal Regime	Substrate Type	Vegetation	Supports Fishery	Fish Habitat Value
West Ravine	Permanent/intermittent	Warmwater	Small gravel and rubble	Low density and diversity of submergent and emergent macrophyte community Riparian – grasses and trees	Indirectly	Downstream nutrient input – leaf litter
Central Ravine	Permanent/intermittent	Warmwater	Boulders, Gravel, cobble, and broken shale	Deciduous riparian forest; little understory Woody debris throughout ravine	Indirectly	Downstream nutrient input – leaf litter
East Ravine	Permanent/intermittent	Warmwater	Organic, gravel and sand	Deciduous riparian forest; little understory	Indirectly	Downstream nutrient input – leaf litter
Water Feature A	Permanent	Warmwater	Silt, gravel, cobble	Riparian grasses and overhanging vegetation (Dogwood, ephemeral species)	Directly	Tolerant baitfish community
Water Feature B	Permanent	Warmwater	Silt, gravel, cobble	Riparian grasses and overhanging vegetation (Dogwood, ephemeral species)	Directly	Tolerant baitfish community
Water Feature C	Intermittent	Warmwater	Silt, gravel, cobble	Riparian grasses and overhanging vegetation (Dogwood, ephemeral species)	Indirectly	Tolerant baitfish community

5.3.8 Benthic Invertebrate Community

Benthic invertebrates were collected from the Centre Ravine and Water Feature A location (Figure 5) Table 5-11) on July 3, 2012. *Amphipoda* were the most abundant taxa at both locations; dominance was 48% and 61% in the Ravine and Water Feature respectively. This was followed by *Trichoptera* (21% dominance) in the Ravine and *Isopoda* (28% dominance) in the Water Feature. These species are abundant and widespread invertebrates, and occur in nearly all freshwater environments.

Taxa richness was similar among the two sampling locations, 11 species were collected in the Ravine and 8 species were collected in the Water Feature. Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) (EPT) orders are pollution sensitive taxa. EPT richness was generally low; 1 EPT species was collected from the Ravine sample and 2 EPT species from the Water Feature sample. Diversity ranged from 0.7 in the Ravine to 0.6 in the

Water Feature. The low EPT index and low abundance of pollution tolerant species, such as Chironomids, suggest that the aquatic environment is not highly influenced by pollution.

**Table 5-10:
Benthic Invertebrate Communities Summary**

Location	Dominant Spp	Richness	EPT Richness	Diversity
Water Feature A	Amphipoda (61%)	8	2	0.6
Centre Ravine	Amphipoda (48%)	11	1	0.7

6.0 SUMMARY OF KEY ATTRIBUTES AND FUNCTIONS

6.1 Terrestrial Ecosystem

No PSW, ANSI or significant natural heritage features are located in the Study Area. There are no rare or uncommon vegetation units within the subject lands. Significant features include: seeps and groundwater indicators, SAR, and habitat for Eastern Wood Pewee and American Redstart (Table 6-1).

Butternut is an important feature as this intolerant hardwood is a good colonizer of openings and provides a source of mast for herbivores. The mid-age to mature forest, along the Nipissing Ridge adds to diversity of structure in the Study Area and to landscape connectivity along the ridge. Habitat for the confirmed breeding of American Redstart, an area sensitive breeding bird, and the Eastern Wood Pewee, a Species of Conservation Concern, maintains a functioning food chain and biological diversity.

**Table 6-1:
Key Functions and Features of Existing Conditions**

Category	Feature/Function	Attributes
Vegetation	Butternut (Species at Risk)	<ul style="list-style-type: none"> 22 individuals located primarily at the bottom of the Nipissing Ridge in the eastern portion of the Study Area
	Mid-age to Mature Forest	<ul style="list-style-type: none"> Deciduous forest in the eastern portion of the Study Area generally has a healthy structure, low presence of invasive species, and species associations typical of southern Ontario
	Groundwater Indicators and seepages	<ul style="list-style-type: none"> Sources of groundwater discharge
	Wetlands	<ul style="list-style-type: none"> Thicket Swamps in eastern portion of Study Area
Wildlife	Area Sensitive Breeding Birds	<ul style="list-style-type: none"> American Redstart, adapted to open forests, observed adjacent to thicket swamp and meadow habitat
	Eastern Wood Pewee	<ul style="list-style-type: none"> Species of Conservation Concern, observed in a variety of habitats.
	Amphibian corridor	<ul style="list-style-type: none"> Connects upstream and downstream breeding habitat
Landscape Connectivity	Nipissing Ridge	<ul style="list-style-type: none"> Ridge acts as a northwest – southeast corridor for wildlife and plant species movement, including associated watercourses

6.2 Aquatic Environment

The fish and fish habitat identified within the Study Area consist of permanent and intermittent warmwater systems. No occurrence of fish listed as species at risk was identified within the water features or ravines. This information and collected habitat data was used to determine the value of the fish and fish habitat at each location. Fish populations and fish habitat in the study area above the ravine are isolated from downstream reaches of the water features and Georgian Bay owing to natural barriers to fish passage in the ravine area and barriers to fish passage associated with downstream culverts. The overall fisheries value of these features was determined to be low.

7.0 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed residential development comprises single family homes, townhomes, and semi-detached homes. Amongst the housing units, the plan incorporates open green space area, parks and a watercourse. In total 277 units are proposed, an approximate area of 60 ha. The existing watercourse will be realigned and integrated into the design of a 60 m wide greenway valley feature. This valley feature will be designed to incorporate aquatic, riparian wetland, amphibian and wildlife habitat functions presently observed on site. The site design is shown on Figure 6.

8.0 IMPACT ANALYSIS AND MITIGATION

8.1 Physiography and Geology

The proposed development comprises the majority of the western half of the subject property above the Nipissing Ridge. The realignment of Water Features A, B and C will be designed to include wetland area and areas of amphibian habitat. Such features rely on subtle hydrogeologic gradients and high water tables. This balance in the hydrogeology will need to be considered in final development plans and also during construction.

Portions of Water Feature A, Water Feature B and Water Feature C (Figure 8) will be realigned as part of the proposed development. These reaches will be diverted into a constructed channel running to the north of its present course but rejoining the old channel upstream of the ravine. A portion of the old channel will continue to serve as an outflow to a proposed stormwater pond. Wetlands and amphibian habitat constructed to offset losses with the realignment will require hydrologic conditions similar to the present conditions. Incised stream channels act to draw down the local water table in their vicinity and it is therefore necessary to ensure that the water table does not drop significantly below the wetland. Fine grained soils such as those present have an increased capacity to “wick” up water from the water table and keep moisture in tension above it. This will provide some leeway in regards to the channel depth design however it is essential that soils around the constructed channel retain this characteristic. Similarly low permeability soils such as these tend to restrict groundwater drainage, thus the water table surface is relative steep and the lateral extent of drawdown will have a relatively limited extent. The channel will be designed to support a floodplain consistent with the conditions required for wetland thicket habitat (Higgins, 2015), and consistent with natural channel design principles (Baird, 2014). It is advised that when designing the depth of the channel the replacement habitat be constructed suitably distal from the stream channel so that soils do not dry out. It is not expected that these developments will have any adverse effects on the hydrologically isolated wetlands below the ridge.

Because of the hydrogeologic conditions across the site it is probable that service corridors, storm sewers, sanitary sewers and watermains will be installed below the water table. Despite the low conductivity of the soils present some dewatering during construction will be necessary. Permeable granular bedding beneath these buried services may act as French Drains and convey groundwater downhill. Infrastructure design consistent with other development projects will be utilized. It is advised that any underground infrastructure corridors requiring a granular sub-base be constructed with compacted clay drain plugs (or equivalent) at appropriate intervals. Such plugs serve to dam the preferential flow of groundwater along these corridors and prevent local drawdown.

If houses with basements are considered, the building code stipulates that basement weeper drains are used to keep the basement envelopes dry. These typically drain to the storm sewer, but will slowly deliver clean ground water. This has the effect of lowering the water table around blocks of houses. Attention to the proximity of houses to the proposed wetlands needs to be paid, to ensure that this effect does not compromise wetland function.

8.2 Impacts of the Proposed Development on Terrestrial Ecosystems

This section first describes then summarizes impacts to terrestrial ecosystems, focusing on features designated as significant in the existing conditions section of this report. It identifies where impacts from site design are anticipated and where they are not. This section concludes with prescriptions for mitigation and an assessment of residual effects only for significant features impacted by site design.

8.2.1 Vegetation Removals

The proposed development is designed to avoid mid-age to mature forest along the Nipissing Ridge identified as significant by the Town of Blue Mountains O.P (Figure 7). The development occurs in the southwestern portion of the Study Area, on the plateau of the Nipissing Ridge. Most proposed removals occur in thicket and meadow communities that are recovering from historical farming.

Twenty three ha of vegetation is proposed for removal (40% of the Study Area). Table 8-1 indicates the area and percent of area by terrestrial ecosystem type requiring removal by the proposed development. Slightly less than one hectare of upland forest is proposed for removal, constituting five percent of Upland Forest in the Study Area. Half a hectare of Eastern White Pine plantation and half a hectare of a Poplar forest comprise this removal.

The majority of removals, by percentage of ecosystem type, occur in thicket wetland habitats in the western section of the Study Area. Of the seven hectares of wetland habitat, five are proposed for removal (75% of available wetland habitat). These removals occur in several wetland habitats: marsh, deciduous swamp, and thicket swamp.

Of the 25 ha of thickets and woodlands, 16 ha (65%) are proposed for removal. Slightly less than 15 of the 16 ha proposed for removal is Dry-Fresh Deciduous Shrub thicket (THDM2). Two woodlands will be affected: One hectare of Green Ash Woodland will be removed (100% of the polygon), and 0.3 ha of a 1.9 ha (65%) Trembling Aspen – Green Ash woodland will be removed. The THDM2 polygons are comprised of a low cover of Green Ash in the overstory. The dominant species are in the thicket sub-canopy, dominated by Common Apple, and Hawthorn Species. A thick layer of Red-osier Dogwood in the shrub layer covers the following dominant ground layer species: Narrow-leaf Goldenrod, and Poison Ivy.

Meadow habitats are not being affected as they occur within the archaeological site; 0.9 ha of a Disturbed Area is proposed for removal.

**Table 8-1:
Proposed Removals by Habitat Type and ELC Polygons.**

ELC Code	Polygon ID	ELC Description	Area (Ha)	Area (Ha) to be Removed by Site Design	Area (Ha) to be Retained by Site Design	% Removed by Site Design
Upland Forest						
FOCM6-1	15a	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.59	0.00	0.59	0
FOCM6-1	15b	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.45	0.45	0.003	99
FODM3-1	9a	Dry - Fresh Poplar Deciduous Forest Type	0.48	0.48	0.00	100
FODM3-1	9b	Dry - Fresh Poplar Deciduous Forest Type	1.29	0.00	1.29	0
FODM3-1	9c	Dry - Fresh Poplar Deciduous Forest Type	0.30	0.00	0.30	0
FODM5-10	20	Dry - Fresh Sugar Maple - Trembling Aspen Deciduous Forest	1.70	0.00	1.70	0
FODM5-2	21a	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.27	0.00	0.27	0
FODM5-2	21b	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.71	0.00	0.71	0
FODM5-3	13a	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	1.03	0.00	1.03	0
FODM5-3	13b	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	2.54	0.00	2.54	0
FODM5-3	13c	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	0.5	0.0	0.5	0
FODM5-9	5a	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	0.3	0.0	0.3	0
FODM5-9	5b	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	3.4	0.0	3.4	0
FODM6-1	17	Fresh - Moist Sugar Maple - Green Ash Deciduous Forest	1.0	0.0	1.0	0
FODM7-20	34	Fresh - Moist Lowland Green Ash Deciduous Forest	3.6	0.0	3.6	0
FODM8-1	24	Fresh - Moist Balsam Poplar - Trembling Aspen Deciduous Forest	1.3	0.0	1.3	0
FODM6-1	19	Fresh - Moist Sugar Maple - White Birch - Hemlock Mixed Forest	2.4	0.0	2.4	0
Upland Forest Total			20.3	0.9	20.3	5
Wetland						
MAMM1-3	33	Reed-canary Grass Graminoid Mineral Meadow Marsh	0.2	0.2	0.0	100
SWD3-4	1	Manitoba Maple Mineral Deciduous Swamp	0.4	0.4	0.0	100
SWDM2-2	30	Green Ash Mineral Deciduous Swamp	0.3	0.0	0.3	0

ELC Code	Polygon ID	ELC Description	Area (Ha)	Area (Ha) to be Removed by Site Design	Area (Ha) to be Retained by Site Design	% Removed by Site Design
SWTM2-1	8a	Red-osier Dogwood Mineral Deciduous Thicket Swamp	5.1	4.8	0.4	93
SWTM2-1	8b	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.1	0.0	0.1	0
SWTM2-1	8c	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.2	0.1	0.1	44
SWTM3	23	Willow Mineral Deciduous Thicket Swamp	1.0	0.0	1.0	0
Wetland Total			7.3	5.4	1.8	75
Thickets and Woodlands						
THCM1-20	31	Dry - Fresh Scots Pine Thicket	0.3	0.0	0.3	0
THDM2	2a	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.8	0.8	0.0	100
THDM2	2b	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.4	0.4	0.0	100
THDM2	2c	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.5	0.5	0.0	100
THDM2	2d	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	16.8	13.0	3.8	77
THDM2-1	4	Sumach Deciduous Shrub Thicket	2.6	0.0	2.6	0
THDM4-1	32	Green Ash Regeneration Thicket	0.3	0.0	0.3	0
WOD5	14	Fresh - Moist Deciduous Woodland (Green Ash)	1.1	1.1	0.0	100
WODM5-1	16	Fresh - Moist Trembling Aspen - Green Ash Deciduous Woodland	1.9	0.3	1.7	13
Thickets and Woodlands Total			24.8	16.1	8.7	65
Meadow						
MEMM3	11a	Dry - Fresh Mixed Meadow	2.2	0.0	2.2	0
MEMM3	11b	Dry - Fresh Mixed Meadow	0.4	0.0	0.4	0
MEMM3	11c	Dry - Fresh Mixed Meadow	0.8	0.0	0.8	0
Meadow Total			3.4	0.0	3.4	0.0
Disturbed Area						
DIS		Disturbed Area	1.5	0.9	0.6	61
DIS		Disturbed Area	0.9	0.0	0.9	0
Disturbed Area Total			9.2	0.9	8.3	10

8.2.2 Species at Risk

Of the 22 Butternut individuals identified in the Study Area, two have the potential to be affected by site design. Butternut 28 (JUGCINE_28) is located 5-10 m to the north of the site design boundary. This individual is 40 cm in diameter, appears to be healthy, has a full canopy, and has minimal evidence of soot from Butternut Canker. It is on the slope of the Nipissing Ridge in Dry-Fresh Sugar Maple-Deciduous Forest (Polygon 5b), comprised of a common association of tolerant hardwood species. Although within 5-10 m of the site design boundary, this individual is approximately 25 m from a proposed paved road.

Butternut 29 (JUGCINE_29) is located on the border of the site design boundary in Disturbed Area 35a, very close to Butternut 28 described above (Figure 7). This sapling is 5 cm in diameter, and is likely an offspring of Butternut 28. It is in similar health to Butternut 28; it appears to be healthy, has a full canopy, and has minimal evidence of soot from Butternut Canker. This individual is within the site design area, in a location not proposed for a home or infrastructure. It is approximately 15 m from the edge of a proposed paved road.

Impact

Construction and operation of the proposed development have the potential to indirectly impact the health of these individuals by accidental mechanical harm and soil compaction around their root zones.

8.2.3 Wildlife

8.2.3.1 Species of Conservation Concern

The Eastern Wood Pewee was identified at point locations 3, 4, and 6 (Figure 7). Breeding was confirmed by inference at point 4. Of these locations, only survey point 3 is located within the site design area. The point is located within the site design boundary, but outside proposed paved surfaces and / or home lots. The habitat in which the individuals were heard is on a plateau to Nipissing Ridge, in an area of a Trembling Aspen – Green Ash Woodland, bordering a disturbed area and Sugar Maple forest on the slope of the ridge. It is likely the individuals are primarily using the habitat on the slope.

Impacts

Removal of habitat indirectly affects the species by reducing foraging and potential nesting habitat. During the construction phase of development, individuals may display avoidance behaviour due to construction noise and activity. During the operation phase, the conversion of the disturbed area to housing units may decrease habitat suitability.

8.2.3.2 Area Sensitive Breeding Birds

No impacts to habitat for the American Redstart are anticipated as it was heard at survey point 5, far to the east of the site design area.

8.2.4 Landscape Connectivity

The Nipissing Ridge, running northwest-southeast through the central-eastern section of the Study Area is an important area of landscape connectivity. As the ridge is largely undeveloped and forested, it acts as a corridor, connecting habitat to the north and south of the Study Area. The watercourses provide a corridor connecting areas to the west of the ridge with the ridge.

Impacts

The site design does not remove forest along and below (east) of the Nipissing Ridge. However, the Thicket and Swamp thicket areas to the west of the Nipissing Ridge will be removed by site design. The site design decreases this width, but does not cut off, or fragment, the northwest – southeast linkage of the forested Nipissing Ridge. Furthermore, the proposed new channel realignment will be naturalized and will maintain these linkages.

8.2.5 Summary of Impacts of the Proposed Development on Terrestrial Ecosystems

As described above, the removal of vegetation, with the exception of wetland habitat, is not considered significant, therefore, vegetation removal is not identified as an impact. Vegetation removals are summarized here in order to convey a complete ecological accounting. Vegetation removal is proposed to occur in all four ecosystem types, totalling 23.3 ha of vegetation removal (40% of the Study Area), summarized in Table 8-2.

**Table 8-2:
Vegetation Removal Summary.**

Ecosystem Type	Area (ha) Removed by Site Design
Upland Forest	0.9
Wetland	5.4*
Thicket	14.7
Woodland	1.4
Disturbed Area	0.9
Total	23.3

* Further described in wetland section below

The existing conditions section of this report described all terrestrial features and concluded with the identification of significant features. This section of the report described impacts to significant features. Not all significant features are impacted by the proposed development, as described above and summarized in Table 8-3.

**Table 8-3:
Summary of Potential Impacts and Effects to Significant Features.**

Category	Feature/Function	Potential Impact and Effects
Vegetation	Butternut (Species at Risk)	<ul style="list-style-type: none"> • Indirect effects to two individuals in site design area (i.e., mechanical damage and soil compaction)
	Mid-age to Mature Forest	<ul style="list-style-type: none"> • No impact anticipated • Not present within site design area
	Groundwater Indicators and seepages	<ul style="list-style-type: none"> • Building basements may interact with groundwater conditions. See section 8.1 for further information.
	Wetlands	<ul style="list-style-type: none"> • 5.4 ha removed
Wildlife	Area Sensitive Breeding Birds	<ul style="list-style-type: none"> • Indirect effects to population by decrease of foraging habitat
	Eastern Wood Pewee	
Landscape Connectivity	Nipissing Ridge	<ul style="list-style-type: none"> • No direct effect anticipated to Nipissing Ridge • One of the two watercourses providing a link to the ridge will be realigned, resulting in no loss of function. • Amphibian corridor function will be maintained •

8.3 Mitigation of Terrestrial Impacts

This section prescribes mitigation and an assessment of residual effects only for significant features impacted by site design. The mitigation strategies outlined below and summarized in Table 8-4, if properly implemented will, in some cases reduce, and in other instances eliminate, potential negative environmental effects.

8.3.1 *Butternut*

Disturbance within 25 m of these trees is proposed, therefore the subject Butternut trees shall be registered with the MNR during subsequent design stages. Registration of the individuals requires an assessment by a Registered Butternut Health Assessor during the growing season. As the trees are to be retained, hoarding will be placed along the dripline of the individuals to avoid mechanical damage and soil compaction. As the individuals are adjacent to the 15 m buffer from the ridge, there is room to encourage natural regeneration of this intolerant species in the open habitat in this buffer.

8.3.2 *Wetlands*

The site design removes 5.4 ha of wetlands, which are largely thicket swamps. The proposed stream realignment and 613 m riparian area (totalling 0.82 ha) will be designed by hydrogeologists, fluvial geomorphologists, aquatic ecologists, and terrestrial ecologists to maintain wetland features and functions. This wetland habitat will vary in moisture regime, creating a diversity of wetland habitat, including marsh, swamp thicket, and swamp. These restoration plantings will require time to achieve the function of the targeted vegetation as the

seedlings and / or saplings take time to mature. See Section 8.3.5 for Restoration Plan Concepts.

8.3.3 Wildlife

All vegetation clearing will be conducted outside the breeding bird window, May 5 – July 30, to avoid contravention of the *Migratory Birds Convention Act*.

To mitigate reduction in habitat suitability due to conversion of the disturbed area to roads and housing, it is possible to not only replace this lost function, but to enhance it through the restoration and planting plan (please refer to Restoration Plan Concepts Section 8.3.5). These restoration plantings will require time to achieve the function of the targeted vegetation as the seedlings and / or saplings take time to mature. This EIS commits to incorporating Eastern Wood Pewee habitat restoration into the restoration plan.

As described in Section 5.2.7, there is potential for Barn Swallow and bat roosting/hibernating habitat in old infrastructure. A search prior to demolition is required.

8.3.4 Landscape Connectivity

Impacts to the significant Nipissing Ridge corridor, and its associated mid-age to mature forest, have largely been mitigated by site design. There is opportunity for fill planting along the ridge to enhance its ecological function.

The most southern watercourse connection will be maintained, while the central watercourse will be realigned and restored, following the Restoration Plan Concepts (Section 8.3.5).

8.3.5 Restoration Plan Concepts

A restoration plan is required to mitigate impacts caused by vegetation removal. The restoration plan will be designed in consultation with the proponent, the Town of Blue Mountains, and Grey Sauble Conservation Authority. This section is not a restoration plan, but provides an overview of concepts and opportunities to be incorporated in the plan.

Only native species will be planted and planting locations will be consistent with species soil, moisture, and light requirements. Planting locations will be selected in areas identified as requiring restoration and will consider both local (stand level) and regional (landscape level) ecology. The follow are areas and concepts for potential restoration opportunities:

- The channel re-alignment will be designed to provide restoration opportunities for wetland habit, including features required for amphibian breeding. The amphibian corridor must be maintained.
- There is opportunity to enhance young to mid-age areas of Nipissing Ridge through additional plantings.
- There is opportunity for restoration in the young, early successional areas in the far eastern portion of the Study Area (Polygon 11a) and in the 15 m setback from Nipissing Ridge
- There is opportunity to encourage Butternut natural regeneration in the 15 m setback from Nipissing ridge

- Species associations will incorporate habitat requirements for breeding birds observed during surveys, with particular attention paid to Eastern Pewee Habitat

8.3.6 *Summary of Impacts, Mitigation Measures, and Determination of Scale of Residual Effects*

The residual effects determined through the impact assessment illustrate that the majority of potential impacts have been reduced through design. Additionally, the reduction of short-term construction related impacts can also be achieved with the application of mitigation, including a restoration plan to be designed in consultation with applicable agencies. In summary, the scale of negative residual effects to terrestrial ecosystems as a result of proposed project designs is determined to be low. Table 8-4 summarizes impacts, mitigation, and net residual effects to terrestrial ecosystems

**Table 8-4:
Summary of Impacts, Mitigation, and Net Residual Effects.**

Category	Feature Function	Impact and Effects	Mitigation/Compensation/Enhancement Measures	Net Residual Effects
Vegetation	Butternut (Species at Risk)	<ul style="list-style-type: none"> Two individuals in site design area Indirect effects include mechanical damage and soil compaction 	<ul style="list-style-type: none"> Butternut Health Assessment Registration under the ESA Tree hoarding will be placed along the dripline Maintain suitable open habitat to encourage establishment of natural regeneration in the buffer for intolerant hardwood 	<ul style="list-style-type: none"> None, trees are protected Potential increase in species abundance by encouraging regeneration in buffer
	Wetlands	<ul style="list-style-type: none"> 5.4 ha of removal Considered a direct effect 	<ul style="list-style-type: none"> Conservation and Restoration of wetland area in the stream realignment buffer. Details of restoration plan to be determined in consultation with applicable agencies. 	<ul style="list-style-type: none"> Loss of area of wetland. Wetland features and functions to be maintained or created within the corridor. Wetlands and seepage at tow of slope to be maintained and not affected by tableland development
Wildlife	Eastern Wood Pewee and Area Sensitive Forest Breeding Birds	<ul style="list-style-type: none"> Indirect effects to population by decrease of foraging habitat through vegetation removal 	<ul style="list-style-type: none"> Discuss need for permit with MNRF under ESA, 2007 Vegetation removal activities will be restricted to outside the breeding bird window (May 5 – July 30) Restoration of habitat will occur as prescribed in the restoration plan 	<ul style="list-style-type: none"> There will be a slight time lag for function to return while planted vegetation matures
	Amphibian Corridor	<ul style="list-style-type: none"> Temporary reduction in habitat while watercourse is being realigned 	<ul style="list-style-type: none"> Maintain corridor of wetlands and aquatic habitat connecting upstream and downstream amphibian breeding areas 	<ul style="list-style-type: none"> None
Landscape Connectivity	Nipissing Ridge	<ul style="list-style-type: none"> No direct effect anticipated to Nipissing Ridge 	<ul style="list-style-type: none"> A portion of the restoration will focus on enhancing areas to the east of Nipissing Ridge, to reduce the effect of corridor width reduction Increase of forest function on Nipissing Ridge through fill planting Watercourse linkages will be maintained via one watercourse and designed in the re-aligned channel buffer 	<ul style="list-style-type: none"> None Potential for enhancement though planting

8.4 Impacts of the Proposed Development on Aquatic Environment

8.4.1 Assessment Process

The Fisheries Protection Policy Statement (DFO 2013) requires proponents to demonstrate that measures and standards have been applied to avoid, then mitigate and finally offset residual *serious harm to fish* that are part of or support commercial, recreational or Aboriginal fisheries.

The fisheries biologists for this project worked with the planners, developers, and design engineers to understand the risks to fish and fish habitat as a result of the proposed residential development on the Home Farm property. This information was integrated into the evaluation of design alternatives and selection of the proposed design plan. The purpose of this section is to assess the potential impacts on fish and fish habitat associated with the proposed Site Plan (Drawing 1410-209-S (Figure 6)).

The proposed work activities were screened using DFO's Self-Assessment process to determine if the Home Farm development requires project review by DFO. Using the self-assessment criteria, SLR biologists determined that proposed project requires review by DFO, and that a fisheries assessment would be the appropriate risk determination tool to assess the risk of causing serious harm to fish and fish habitat. Using the risk determination process developed by DFO, the project's construction activities were screened for the potential of resulting in *serious harm* to fish while considering both design modifications and appropriate mitigation. The risk based evaluation uses the net or residual effects resulting from the proposed works.

DFO developed the Pathways of Effects (PoE) as a framework for assessing the potential impacts of a project on fish and fish habitat. DFO uses PoEs to describe projects in terms of:

- *the activities that are involved (e.g., vegetation clearing, flow management);*
- *the type of cause-effect relationships that are known to exist between a project and fish and fish habitat that create 'stress' on the fish and fish habitat; and*
- *the mechanisms by which stressors ultimately lead to effects on the aquatic environment.*

The PoEs are also linked to mitigation, in that the effect pathway can be 'broken' by applying mitigation measures to avoid or minimize the effect. This PoE approach is useful to determine possible cause-and-effect relationships between in-water or near water activities on the aquatic environment. At the beginning stages of project design, all activities that have the potential to affect fish habitat in a negative way are identified, and methods for eliminating or mitigating each of the POEs are evaluated. By following this approach, a clear understanding of potential aquatic impacts can be demonstrated up-front, and an assessment of residual risk can be undertaken.

In general, potential impacts from the proposed development and channel realignment could include: site erosion and release of sediment laden water into the creek; temporary avoidance by fish of the in-water areas adjacent to the new channel due to work activity; fuel spills from storage and refuelling of equipment; removal of riparian vegetation; temporary isolation/encroachment of watercourse habitat due to mitigation techniques (coffer dams, silt curtains, etc.), and permanent bank alteration and channel infill resulting from realignment.

The risk to fish habitat from these and other potential impacts is often controlled or eliminated through the use of: timing windows for in-water construction; standard best management practices for erosion and sediment control; construction access, site controls and operational constraints; and construction monitoring and inspection.

Potential impacts of the proposed development have largely been avoided through design. The evaluation of alternatives as it relates to project layout, phasing, and construction of various project components have largely mitigated potential adverse effects. Of particular importance was avoiding project overprinting of significant ravine features. However, there is potential for adverse impacts to occur as a result of the selected project design components. These potential impacts and mitigation strategies are discussed in the sections below.

8.4.2 Impact Assessment

The following discussion provides a detailed evaluation of potential impacts using the POE framework for assessment. The extent, duration and intensity of the potential impacts were considered specifically in relation to the sensitivity of the fish and fish habitat. In general, these potential effects fall into two broad categories of site preparation and construction which are generally short to moderate duration. Each of these categories has elements that can potentially put fish and fish habitat at risk.

The development avoids disturbance to sensitive features identified on the northern portion of the property (Figure 8). Work activity in or near water bodies to facilitate the proposed development involves permanent channel realignment at the southeast portion of the property. A proposed meandering channel has been designed to connect the existing stream at Helen Street with the existing ravine just downhill of the subdivision. The proposed shift in channel alignment is based on ephemeral drainage features on the study site (Appendix G). The proposed channel has been designed to convey dry weather flows in a low-flow channel and to accommodate larger flows via a larger floodplain channel that will also serve as a wetland shelf.

The existing concrete box culvert located at Helen Street will be replaced with a wider (4 – 6 m width to accommodate the Regional storm) and reduce any constriction to water flow. Culvert replacement will be completed in the dry by isolating the work area (coffer dam and pump). Two new culvert installations are proposed further downstream (4 – 6 m width) in the new channel for road crossings. The details of the culvert design are not yet confirmed. The new culverts will be either 1) concrete con-span structures with open bottoms and no footings or 2) buried box culverts with natural materials inside.

The storm servicing will be directed towards two SWM ponds, one for each major drainage area. Ponds have been designed to meet quality and quantity design standards according to MOE storm water management pond criteria. In addition an infiltration basin is proposed to mitigate impacts from runoff.

Direct impacts to fish are not anticipated. The new channel will be designed in the dry and the new channel will be commissioned after construction is complete. Qualified biologists will be on site to rescue fish that may become stranded when the new channel is commissioned. Approximately 1280 m of the existing channels will be decommissioned, flows in Water Feature A, B and C will be combined, and approximately 754 m of watercourse length will be created; a total net loss of water course length, but total net gain of approximately 62 m² of aquatic habitat area and 8243 m² of riparian habitat (Table 8-5).

**Table 8-5:
Summary of Anticipated Project Impacts**

Location	Flow Regime	Channel Length (m)		Channel Area (m ²)	
		Proposed Habitat Removal (m)	Proposed Habitat Gain (m)	Proposed Habitat Removal (m ²)	Proposed Habitat Gain (m ²)
Water Feature A	Permanent	-578	-	-2322	-
Water Feature B	Permanent	-202	-	-717	-
Water Feature C	Intermittent	-500	-	-1381	-
Channel Realignment	Permanent	-	+754	-	+4882
Riparian Area		-	-	-	+8243
Total		-1280	+754	-4420	+13122
Net Total		-527 m		+8702 m²	

Creek realignments have the potential to cause serious harm to fish and fish habitat through improper design, simplification of habitat type, and increased sediment loading. Mitigation measures such as erosion and sediment controls, isolation of work area, and timing restrictions commonly negate any harm. The majority of works will be performed in the dry to help reduce potential adverse effects to fish and fish habitat. During construction, downstream flow and connection to the upstream reaches will be maintained in the existing channel while the new channel is being constructed in the dry. Once the new channel is in place, the watercourses will be redirected into the new channel. Flow will be redirected during the window of least risk to fish and fish habitat; July 15 to March 15 when the new channel is commissioned. A fish salvage will be completed in the existing channel and fish will be relocated to the new realigned watercourse. The existing channel will be decommissioned and removed.

Aquatic habitat, flow conditions and opportunities for fish will be enhanced as a result of the channel realignment. The new channel has been designed according to natural channel design principles, by qualified fluvial geomorphologists, and incorporate habitat characteristics and functions that support resident fish species. By incorporating appropriate meander radius, substrate size, and longitudinal gradient, pool-riffle sequences, and channel width and depth these features will provide habitat for fish spawning, rearing, young and adult growth.

The new watercourse will comprise a gravel bed of clean river stone with diameter ranging from 20 to 200 mm. The finer substrate (20 mm) will be placed in pools, and the courser material will be placed in riffle sections to emulate the natural along-stream variation in grain size observed

in alluvial channels. Plantings to high water mark are preferred in order to create shade for water temperature modification and increased leaf litter to stream as food source for fish and invertebrates.

The new channel will also include floodplain and pool areas with seasonal shallow water depths to create thicket wetland habitat. The seasonal riparian pools and floodplain inundation will support amphibian breeding and adult growth. The new channel will concentrate multiple drainage features within the study area into a single feature. Ultimately this will improve existing fish habitat by converting intermittent or ephemeral features with limited function and many points of constriction into a permanent feature with improved habitat function and productivity.

The design plan has allowed for a 30 m buffer zone between the residential houses and the watercourses. This zone will assist with the protection of fish and fish habitat during construction and post construction phases. Nonetheless, construction activities have the potential to temporarily alter the aquatic environment. Identified PoEs include: excavation, grading, riparian planting, use of industrial equipment, vegetation clearing, and temporary placement of material in water. These activities have the potential to alter surface water quality and habitat function in the Study Area as a result of site erosion and release of sediment laden water, and surface runoff and the introduction of deleterious substances from fuel spills (e.g. storage and refuelling of equipment). These activities could cause temporary avoidance of habitat, alter dissolved oxygen content, temporarily decrease visibility for fish, complicate breathing through gills, and smother invertebrates and plants.

The construction of access roads will require vegetation clearing, stockpiling of material, grading, and machinery staging areas. Similarly, these processes have the potential for several impacts to fish and fish habitat such as sediment disturbance or erosion, and the introduction of deleterious substances. Grading activities have the potential to alter land slope and drainage patterns which can increase erosion and/or surface runoff. Additionally as a result of land disturbance activities, there is potential for in-water vibrations and noise to adversely affect fish behaviour and habitat use.

Mitigation measures such as erosion and sediment controls, isolation of work area, and timing restrictions commonly negate any harm. The majority of works will be performed in the dry to help reduce potential adverse effects to fish and fish habitat. These and other mitigation strategies are discussed in the next section.

8.5 Mitigation of Aquatic Impacts

Mitigation by design has been achieved through the evaluation of site plan alternatives and construction components. Hydrogeologists, fluvial geomorphologists, aquatic and terrestrial ecologists worked with developers to further refine the development proposal into a plan that maintains functions associated with the existing groundwater and surface water interactions and enhances habitat for fish, other aquatic biota, amphibians and flora.

Anticipated impacts and alterations to flow patterns have been avoided by applying natural channel design principles to inform appropriate channel design. The proposed meandering channel has been designed to connect the existing stream at Helen Street with the existing ravine just downhill of the subdivision. The channel has been designed to convey dry weather flows in a low – flow channel and to utilize seasonal larger flows via a larger floodplain channel to support a riparian wetland community.

The proper implementation of mitigation strategies outlined below will assist in the avoidance of serious harm to fish as a result of project related works. These measures and all the site specific measures will continue to be refined and detailed as the design evolves through subsequent design phases. The mitigation measures will be finalized based on the final design, and its effects on fish and fish habitat. In addition, comprehensive construction mitigation involves recognition and implementation of additional control measures that may be identified through good construction practices and environmental inspection.

8.5.1 Fish Protection

All in-water and near-water activities will be conducted within the applicable in-water construction timing windows, as identified by MNR, to protect the resident fishery life functions as outlined below. Fish protection measures include:

- The warmwater timing window of July 1st to March 31st recommended by MNR for all in-water works. All in-water activities must occur within this construction timing window. Activities to which this timing window applies include the redirection of flow into the new watercourses alignment.
- All in-water activities shall be performed in the dry. This may require construction to occur behind water tight isolation barriers (coffer dam, Aqua-Dam, sheet piling, etc.).
- Any fish stranded within the temporary in-water work zones will be removed and relocated using appropriate techniques by a qualified fisheries specialist possessing a valid Scientific Collector's Permit.

8.5.2 Erosion and Sediment Control

A comprehensive erosion and sediment control (ESC) plan will be developed in subsequent design phases and implemented to prevent migration of sediment laden runoff (or other contaminants) from the construction zone to the creek. This plan will include inspection and maintenance of the measures until final cover is established. Specific aspects include:

- Perimeter silt fence installed between the work areas and along the existing watercourse banks within the area of construction.
- Silt fence properly installed and regularly inspected and maintained. Sediment control will be left in place and maintained until all surfaces contributing drainage to these watercourses are fully stabilized.
- All exposed and newly constructed surfaces will be stabilized using appropriate means in accordance with the characteristics of the soil material. These surfaces will be re-vegetated as quickly as possible following completion of the proposed works.
- Emergency response plan including contingency procedures, materials and notification procedures will be readily available for use in the event of a silt release and for general application in regular maintenance and repair.

8.5.3 Construction Access, Site Controls and Operational Constraints

- The construction access and work areas to be confined to the extent required for the construction activities, and these areas are to be defined in the field using appropriately installed protective fencing or other suitable barriers.

- Removal of riparian vegetation, particularly woody vegetation, will be kept to the minimum necessary for the project works. Woody vegetation that is removed should be replaced with appropriate native species.
- Any temporarily stockpiled material, construction or related materials will be properly contained (e.g. within silt fencing) in areas separated a minimum of 30 m from any waterbody.
- All construction materials and debris will be removed and appropriately disposed of following construction.
- Every effort will be made to retain as much of the natural vegetation as reasonably possible to help ensure bank stability, control erosion and expedite the re-colonization of vegetative cover.
- All vegetation clearing will be conducted using proper clearing techniques and appropriate construction timing windows as may be defined by other legislation (e.g. *Migratory Birds Convention Act – March 25 to August 31 restricted Environment Canada timing window*).
- All activity will be controlled to prevent entry of any petroleum products, debris or other potential contaminants / deleterious substances, in addition to sediment as outlined above, to any waterbody. No storage, maintenance or refuelling of equipment will be conducted near any waterbody. A Spills Prevention and Response Plan will be developed and kept on site at all times.

8.5.4 Rehabilitation Following Construction

- All of the areas disturbed during construction will be restored, stabilized and re-vegetated as soon as the works are completed to prevent migration of fine material to watercourses during runoff events, as well as minimizing the opportunity for colonization of the area by invasive non-native species.
- Only native plants, compatible with site conditions will be used.

8.5.5 Summary of Impacts, Mitigation Measures, and Determination of Scale of Residual Effects

The residual effects determined through the impact assessment illustrate that the majority of potential impacts have been avoided through design. Additionally, the reduction of short-term construction related impacts can also be achieved with the application of mitigation using the PoEs. In summary, the scale of negative residual effects to fish and fish habitat as a result of proposed project designs is determined to be Low (Table 8-6).

**Table 8-6:
Fish and Fish Habitat Residual Effects Table**

Evaluation Criteria	Potential Effects	Mitigation/Compensation/Enhancement Measures	Net Residual Effects
<p>Direct and Indirect effects to fish and fish habitat</p>	<ul style="list-style-type: none"> ▪ Direct loss of existing marginal fish habitat as a result of channel alignment. ▪ Potential to obstruct flow during construction. ▪ Altered surface water quality due to sediment disturbance or erosion, and the introduction of deleterious substances. ▪ Vegetation will establish over time, however for a period after construction occurs, there will be a reduction in shading and this could increase summer water temperatures. ▪ Construction of additional fish habitat as a result of channel realignment. ▪ More naturalized channel would benefit fish providing enhanced habitat diversity. ▪ Opportunity to provide functional habitat for spawning, rearing, young and adult growth. ▪ Additional vegetation and natural features would be installed that would contribute to direct and downstream habitat. 	<ul style="list-style-type: none"> ▪ Construction of the new channel will be completed in the dry; the new channel will be commissioned when construction is complete and the channel is stable. ▪ In-water work and commissioning of new channel will occur during the appropriate fish timing window provided by MNR to minimize risk to fish during sensitive periods (spawning). ▪ Aquatic ecologists will provide input on channel design and habitat to maximize benefits. ▪ A qualified biologist will be on-call during in-water activities and commissioning of new channel to rescue any stranded or isolated fish. ▪ Pool-riffle sequence will help with fish habitat development and in achieving appropriate flow velocities for fish passage. ▪ Floodplain pools and riparian vegetation will provide opportunities for amphibians and other aquatic and riparian species ▪ Post construction channel monitoring to determine stability and habitat availability within the new channel. ▪ Restoration plans will include proposed plantings along the riparian corridor for shading and cooling of water. 	<ul style="list-style-type: none"> ▪ Net increase in available aquatic habitat. ▪ Potential to improve the suitability of sections of the watercourse for fish passage and habitat. ▪ Pool-riffle sequences implemented in realigned sections will provide habitat for fish spawning, rearing, young and adult growth, thus avoiding serious harm to fish and fish habitat. ▪ Riparian and flood plain habitat for amphibians that does not exist presently ▪ Anticipate potential raise in temperature initially, with decreased summer water temperatures occurring as aquatic vegetation establishes and provides shade. ▪ With proper mitigation, the scale of residual effects is considered low. ▪ Residual effects are not anticipated to occur outside of the Study Area.

8.6 Categorization of Project Risk and Likelihood of Serious Harm to Fish

The process of determining *serious harm* to fish and fish habitat has been determined through consideration of the scale or severity of residual effects and the sensitivity of the fish and fish habitat potentially affected. The conditions used to assess potential risk are listed below.

- In-water work will be completed in the dry, while maintaining downstream flow.
- Any in-water works will be completed in the timing window of least risk.
- There should be no temporary obstruction to fish passage.
- Habitat is relatively homogenous throughout the Study Area and the project is not expected to affect any highly suitable spawning or rearing habitat for any particular fish species;
- Species present in the Study Area reflect a typical southern Ontario warmwater fish community with species that are relatively tolerant of stresses associated with urbanization;
- Potential removal or alteration of riparian habitat is not expected to cause changes to the productivity (aquatic community or habitat) of the system;
- Potential water quality alterations are not expected to result in observable change in fish community structure or habitat function if mitigation strategies are applied;
- Areas where vegetation removal is required will be offset with riparian plantings (native seed mix); and,
- Anticipate an overall net increase in aquatic habitat area and function in the realigned channel.

Provided that the features of the current design plan (Drawing 1410-209-S) are carried forward and appropriate mitigation measures are followed, the potential risk to fish and fish habitat as a result of the proposed site plan are anticipated to be low. As a result, the project is not likely to result in a *serious harm to fish* and an authorization under the *Fisheries Act* should not be required. A Request for Project Review form has been prepared and submitted to DFO.

9.0 IMPLEMENTATION AND MONITORING PLAN

An implementation plan and an evaluation of the need for a monitoring plan are requirements of an EIS, as per section 8.25 of the Town of Blue Mountains Official Plan. This EIS commits to completing both the channel realignment design and restoration plan at future design phases of the project. Both an implementation plan and monitoring plan will be incorporated in this future phase.

10.0 CONCLUSIONS

This report summarizes the results of the natural heritage existing conditions investigation and Impact Assessment performed by SLR Consulting for the proposed Home Farm residential development.

Data collected through the desktop analysis and the terrestrial and aquatic field investigations were used to provide a description of the terrestrial animals and habitat, and the fish and fish habitat associated with Home Farm property.

A loss of terrestrial habitat associated with the proposed development will occur, largely in the form of thickets; however the lands are designated to permit development. The proposed channel re-alignment is integrated into a 60 m wide valley feature. This feature is designed to provide aquatic, riparian wetland, amphibian and wildlife habitat functions observed at present on the site.

The fish species identified within the Study Area do not appear part of or support to a commercial, recreational, or aboriginal fishery. Barriers to fish passage were observed in water features cascading down the ravine. These barriers isolate fish populations in the study area from downstream fish populations. The channel re-alignment will create greater aquatic habitat diversity than presently observed in the study area.

The residual effects determined through the effects assessment illustrate that the majority of potential effects have been mitigated through design. Additionally, the reduction of short-term construction related impacts can also be achieved with the application of specific mitigation, including a restoration plan to be designed in consultation with applicable agencies. In summary, the scale of negative residual effects to terrestrial and aquatic ecosystems as a result of proposed project designs is determined to be low. A Request for Project Review form has been prepared and submitted to DFO.

11.0 REFERENCES

- Baird & Associates Coastal Engineers Ltd., 2014. Realigned Meandering Low Flow Channel.
- Chapman. L.J, Putnam D.F. The Physiography of Southern Ontario- Third Edition. Ministry of Natural Resources: 1984.
- Environment Canada, 1994:
The Migratory Birds Convention Act
- Environment Canada, 2014: General Avoidance Information. <http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=1B16EAFB-1>. Accessed February 2015.
- Fisheries and Oceans Canada (DFO). 2014. Grey Sauble Conservation Authority Species At Risk Distribution Maps. Grey Sauble Conservation Authority. <http://conservation-ontario.on.ca/projects/DFO.html>.
- Holthe, E., E. Lund, B. Finstad, E.B. Thorstad, and R.S. MicKinley. 2005. A Fish Selective Obstacle to Prevent Disperskion of Unwanted Fish species, Based on Leaping Capabilities. Fisheries Management and Ecology 12:143-147.
- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray, 1998: Ecological Land 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.
- Natural Heritage Information Centre (NHIC), Ontario Ministry of Natural Resources Website, 2011: Accessed July 2012.
- Ontario Geologic Survey (OGS), Quaternary Geology and Bedrock Geology Surveys. Taken from Google Earth overlays, February 2015.
- Ontario Ministry of Municipal Affairs and Housing, 2014:
Provincial Policy Statement. Queen's Printer for Ontario. Toronto.
- Ontario Ministry of Natural Resources, 2000: Significant Wildlife Habitat Technical Guide. 151p.
- Stanfield, L. (editor). 2013. Ontario Stream Assessment Protocol. Version 9.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 505 Pages.
- Town of Blue Mountains, 2007: Official Plan. March, 2007.
- Terraprobe, 2011: Draft Geotechnical Investigation. Proposed Home Farm Residential Development. Town of Blue Mountains, Ontario.

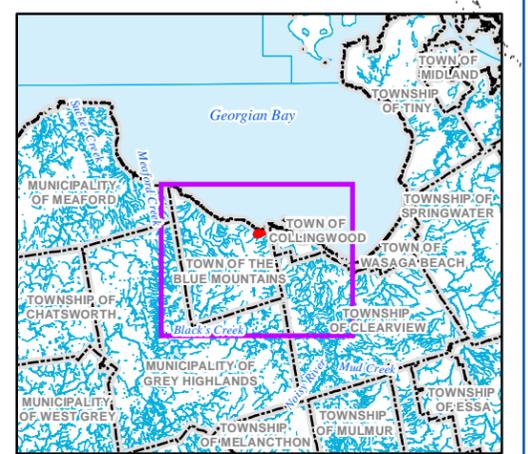
FIGURES

Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000

N:\Markham4 - Projects\McPherson - Builders\Home Farm\209-40019-01 - Home Farm\3.Data & Analysis2.GIS1.MXD\3.WRK\209_40019_StudyArea_Watersheds.mxd



- LEGEND**
- Study Area
 - Watersheds
 - Municipal Boundary
 - Cartographic Wetland
 - Provincially Significant Wetland
 - Waterbody
 - Permanent Watercourse
 - Intermittent Watercourse



0 1.25 2.5 5 Kilometers
 SCALE: 1:100,000
 NAD 1983 UTM Zone 17N

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

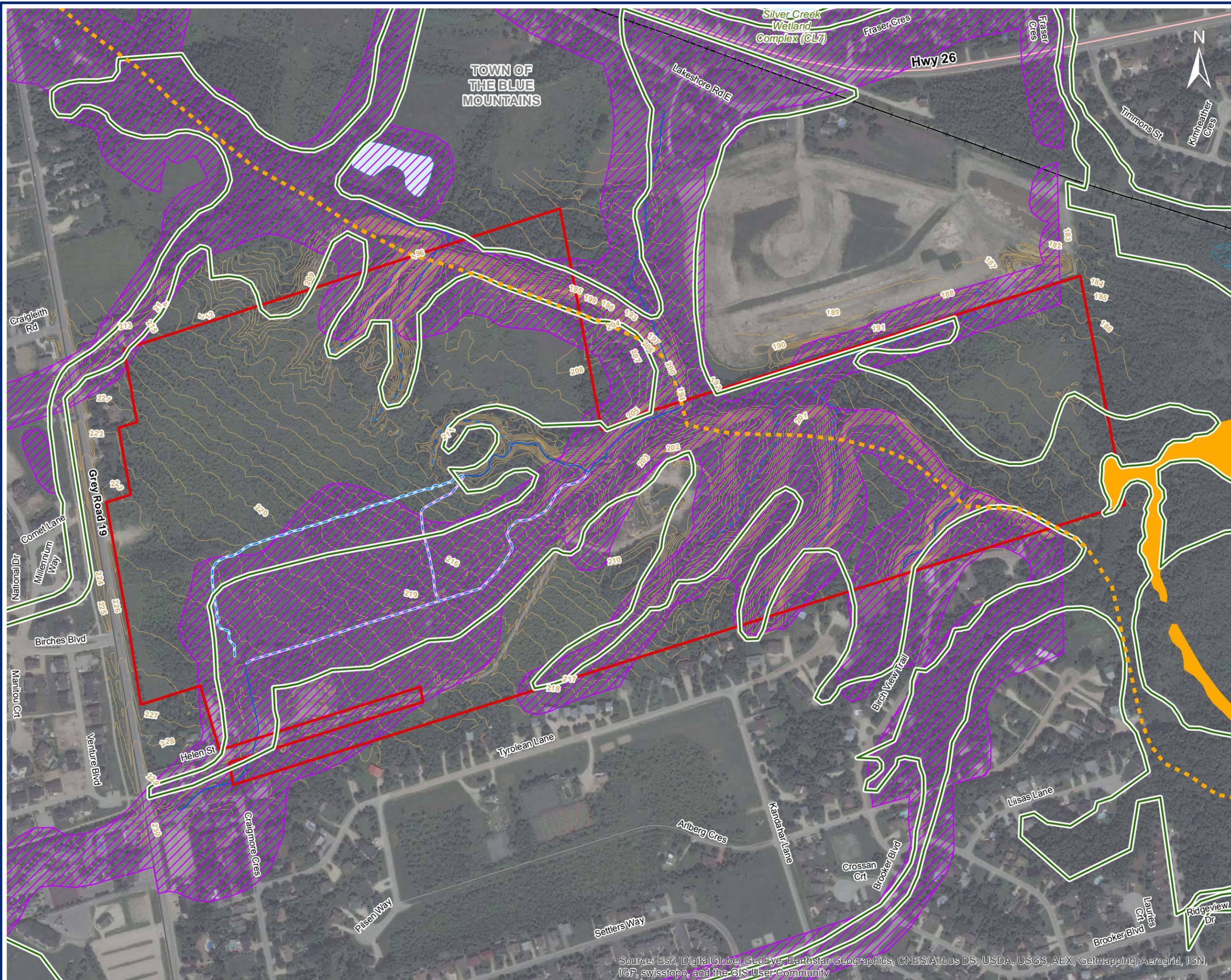
**MACPHERSON BUILDERS
 (BLUE MOUNTAIN)**

NATURAL HERITAGE - EXISTING CONDITIONS
 AND IMPACT ASSESSMENT REPORT

STUDY AREA		
January 14, 2015	Rev 1.0	Figure No.
Project No. 209.40019.00000		1



N:\Markham4_ Projects\MacPherson_Builders\Home Farm\209.40019.01_01_Home Farm\3.Data & Analysis\2.GIS\1.MXD\3.0.WRK\209_40019_TER_ApplicablePolicyAreas_NoSiteDes.mxd



- LEGEND**
- Study Area
 - Lake Nipissing Ridge
 - Slope, Floodplain and Shoreline Hazards (Town of Blue Mountains)
 - Special Policy Area (Town of Blue Mountains)
 - Regulated Areas (Grey Sauble Conservation)
 - Cartographic Wetland
 - Provincially Significant Wetland
 - Waterbodies
 - Flow Observed in 2011
 - Flow Observed in 2012, 2014
 - Intermittent Watercourse
 - Permanent Watercourse
 - Contour (1 m)
 - Railway

0 50 100 200 Meters
 SCALE: 1:5,000
 NAD 1983 UTM Zone 17N

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

**MACPHERSON BUILDERS
 (BLUE MOUNTAIN)**

NATURAL HERITAGE - EXISTING CONDITIONS
 AND IMPACT ASSESSMENT REPORT

STUDY AREA AND
 APPLICABLE POLICY AREAS

April 15, 2015	Rev 1.0	Figure No.
Project No. 209.40019.00001		2



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N:\Markham4 - Projects\MapPherson_BuilderHome Farm\209.40019.01_01_Home Farm\3.Data & Analysis\2.GIS\1.MXD\3.WRK\209_40019_TER_ExistingConditions_NoSiteDes.mxd

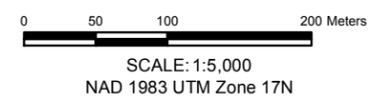


Watercourses_Sampled_FlowDir

DESCRIPTION

- Flow Observed in 2011
- Flow Observed in 2012, 2014
- Intermittent Watercourse
- Permanent Watercourse
- Contour (1 m)
- Railway

Code	Common Name	Scientific Name
<i>Species At Risk</i>		
JUGCINE	Butternut	<i>Juglans cinerea</i>
EAWP	Eastern Wood Pewee	<i>Contopus virens</i>
<i>Area Sensitive Breeding Birds</i>		
SETRUT	American Redstart	<i>Setophaga ruticilla</i>
<i>Groundwater Indicator</i>		
CARSCAB	Rough Sedge	<i>Carex scabrata</i>
NASOFFI	Water-cress	<i>Nasturtium officinale</i>
seep	Sight record of water seepage	N/A



ELC Code	Polygon ID	ELC Description	Existing Area (Ha)
Upland Forest			
FODM6-1	15a	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.99
FODM6-1	15b	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.45
FODM3-1	9a	Dry - Fresh Poplar Deciduous Forest Type	0.48
FODM3-1	9b	Dry - Fresh Poplar Deciduous Forest Type	1.29
FODM3-1	9c	Dry - Fresh Poplar Deciduous Forest Type	0.30
FODM5-10	20	Dry - Fresh Sugar Maple - Trembling Aspen Deciduous Forest	1.70
FODM5-2	21a	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.27
FODM5-2	21b	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.71
FODM5-3	13a	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	1.03
FODM5-3	13b	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	2.54
FODM5-3	13c	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	0.45
FODM5-9	5a	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	0.33
FODM5-9	5b	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	3.42
FODM6-1	17	Fresh - Moist Sugar Maple - Green Ash Deciduous Forest	1.01
FODM7-20	34	Fresh - Moist Lowland Green Ash Deciduous Forest	3.64
FODM8-1	24	Fresh - Moist Balsam Poplar - Trembling Aspen Deciduous Forest	1.26
FODM6-1	19	Fresh - Moist Sugar Maple - White Birch - Hemlock Mixed Forest	2.36
Upland Forest Total			21.84
Wetland			
MAMM1-3	33	Reed-canary Grass Graminoid Mineral Meadow Marsh	0.17
SWD3-4	1	Manitoba Maple Mineral Deciduous Swamp	0.41
SWDM2-2	30	Green Ash Mineral Deciduous Swamp	0.28
SWTM2-1	8a	Red-osier Dogwood Mineral Deciduous Thicket Swamp	5.14
SWTM2-1	8b	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.14
SWTM2-1	8c	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.19
SWTM3	23	Willow Mineral Deciduous Thicket Swamp	0.96
Wetland Total			7.29
Thickets and Woodlands			
THCM1-20	31	Dry - Fresh Scots Pine Thicket	0.34
THDM2	2a	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.83
THDM2	2b	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.45
THDM2	2c	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.46
THDM2	2d	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	16.77
THDM2-1	4	Sumach Deciduous Shrub Thicket	2.56
THDM4-1	32	Green Ash Regeneration Thicket	0.35
WOD5	14	Fresh - Moist Deciduous Woodland (Green Ash)	1.10
WODM6-1	16	Fresh - Moist Trembling Aspen - Green Ash Deciduous Woodland	1.93
Thickets and Woodlands Total			24.79
Meadow and Disturbed Area			
MEMM3	11a	Dry - Fresh Mixed Meadow	2.24
MEMM3	11b	Dry - Fresh Mixed Meadow	0.36
MEMM3	11c	Dry - Fresh Mixed Meadow	0.81
DIS	35a	Disturbed Area	1.48
DIS	35b	Disturbed Area	0.94
Meadow and Disturbed Area Total			5.82

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

MACPHERSON BUILDERS LTD. (BLUE MOUNTAINS)

NATURAL HERITAGE - EXISTING CONDITIONS AND IMPACT ASSESSMENT REPORT

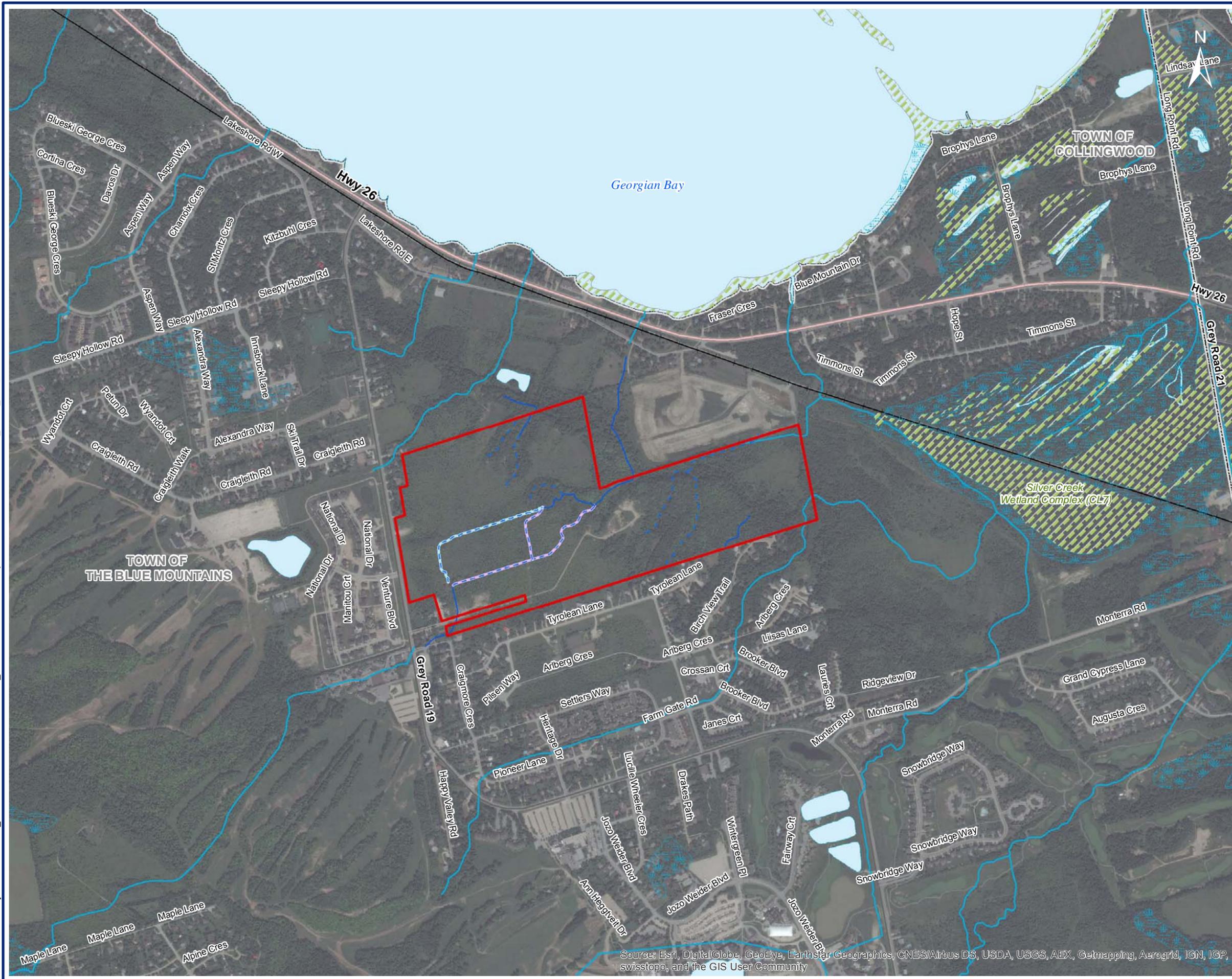
TERRESTRIAL ENVIRONMENT EXISTING CONDITIONS

April 15, 2015	Rev 1.0	Figure No. 3
Project No. 209.40019.00001		

SLR Consulting (Canada) Ltd.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N:\Markham4_ Projects\MacPherson_Builders\Home Farm\209.40019.01_Home Farm\3.Data & Analysis\2_GIS\1.MXD\3.WRK\209_40019_TER_LandscapeConnectivity.mxd



LEGEND

- Study Area
- Cartographic Wetland
- Provincially Significant Wetland
- Waterbodies
- Intermittent Watercourse
- Permanent Watercourse
- Flow Observed in 2011
- Flow Observed in 2012, 2014
- Intermittent Watercourse
- Permanent Watercourse
- Railway

N

0 125 250 500 Meters

SCALE: 1:12,000
NAD 1983 UTM Zone 17N

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

**MACPHERSON BUILDERS LTD.
(BLUE MOUNTAINS)**

**NATURAL HERITAGE - EXISTING CONDITIONS
AND IMPACT ASSESSMENT REPORT**

**TERRESTRIAL ENVIRONMENT
LANDSCAPE CONNECTIVITY**

April 15, 2015	Rev 1.0	Figure No.
Project No. 209.40019.00001		4



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N:\Markham4_P\Projects\MacPherson_Builders\Home Farm\209.40019.01_Home Farm\3.Data & Analysis\2.GIS\1.MXD\3.WRK\G209_40019_FSH_Watercourses_DFO_NoSiteDes.mxd



LEGEND

- Photo Location - Spring
- Photo Location - Summer
- Fisheries/Benthics Sampling Location
- Benthics Sampling Location
- Beaver Dam
- Study Area
- Waterbody
- Railway
- Flow Observed in 2011
- Flow Observed in 2012, 2014
- Intermittent Watercourse
- Permanent Watercourse
- Contour (1 m)

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

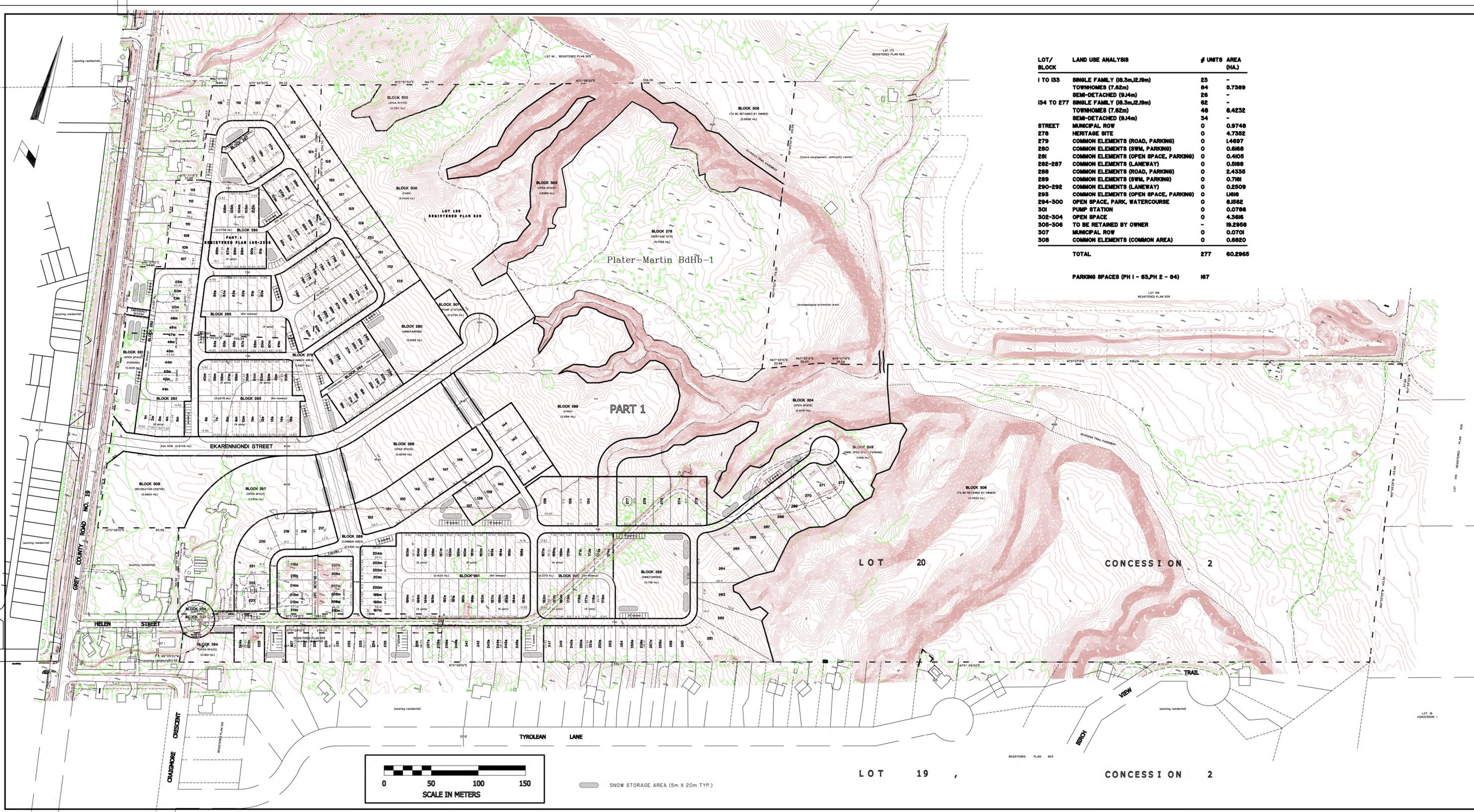
**MACPHERSON BUILDERS LTD.
 (BLUE MOUNTAINS)**

NATURAL HERITAGE - EXISTING CONDITIONS
 AND IMPACT ASSESSMENT REPORT

AQUATIC ENVIRONMENT
 EXISTING CONDITIONS

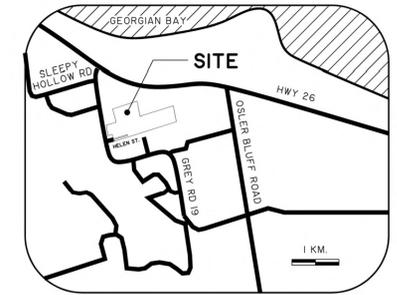
April 15, 2015	Rev 1.0	Figure No.
Project No. 209.40019.00000		5





LOT/ BLOCK	LAND USE ANALYSIS	# UNITS	AREA (HA.)
1 TO 153	SINGLE FAMILY (16.3m, 12.19m)	23	-
	TOWNHOMES (7.62m)	84	5.7369
	SEMI-DETACHED (9.14m)	26	-
154 TO 277	SINGLE FAMILY (16.3m, 12.19m)	62	-
	TOWNHOMES (7.62m)	48	6.4232
	SEMI-DETACHED (9.14m)	34	-
STREET	MUNICIPAL ROW	0	0.9748
278	HERITAGE SITE	0	4.7352
279	COMMON ELEMENTS (ROAD, PARKING)	0	1.4697
280	COMMON ELEMENTS (SWM, PARKING)	0	0.6168
281	COMMON ELEMENTS (OPEN SPACE, PARKING)	0	0.4105
282-287	COMMON ELEMENTS (LANEWAY)	0	0.5188
288	COMMON ELEMENTS (ROAD, PARKING)	0	2.4355
289	COMMON ELEMENTS (SWM, PARKING)	0	0.7181
290-292	COMMON ELEMENTS (LANEWAY)	0	0.2509
293	COMMON ELEMENTS (OPEN SPACE, PARKING)	0	1.6181
294-300	OPEN SPACE, PARK, WATERCOURSE	0	8.1562
301	PUMP STATION	0	0.0786
302-304	OPEN SPACE	0	4.3616
305-306	TO BE RETAINED BY OWNER	-	19.2988
307	MUNICIPAL ROW	0	0.0701
308	COMMON ELEMENTS (COMMON AREA)	0	0.8920
TOTAL		277	60.2965
PARKING SPACES (PH 1 - 63, PH 2 - 84)		167	

DRAFT PLAN
 OF PROPOSED SUBDIVISION
 LOTS 2, 3, 4, 5, 6 AND 7,
 REGISTERED PLAN 555 AND
 PART OF LOT 159
 REGISTERED PLAN 529 AND
 PART OF LOT 20
 CONCESSION 2
 PART I, PLAN I6R-2536
 PART OF HELEN STREET ROW
 TOWN OF THE BLUE MOUNTAINS
 COUNTY OF GREY



KEY PLAN
OWNER'S AUTHORIZATION
 I hereby authorize Higgins Engineering Limited, Consulting Engineers and Planners, to prepare and submit this proposed plan of subdivision

MACPHERSON BUILDERS (BLUE MOUNTAINS) LIMITED DATE _____
 RUSSELL HIGGINS (AUTHORIZED SIGNING OFFICER)

TOWN OF THE BLUE MOUNTAINS DATE _____
 ELLEN ANDERSON (MAYOR)

TOWN OF THE BLUE MOUNTAINS DATE _____
 CORRINA GILES (CLERK)

SURVEYOR'S CERTIFICATE
 I hereby certify that the boundary of the lots to be subdivided as shown on this plan and their relationship to the adjacent lands are accurately and correctly shown

ZUBEK, EMO AND PATTEN LTD. DATE _____

ADDITIONAL INFORMATION
 Required under Section 50(2) of the Planning Act

(a) as shown (b) as shown (c) as shown (d) as shown (e) as shown (f) as shown (g) municipal / private water (h) fill over bedrock (i) residential / open space (j) municipal / private sewers (k) as shown (l) as shown

No.	REVISIONS	DATE	APPROVED

Figure 6

Higgins ENGINEERING LIMITED
 CONSULTING ENGINEERS AND PLANNERS
 416 MOORE AVENUE, SUITE 306, TORONTO, (416) 443-8001

TOWN OF THE BLUE MOUNTAINS
 PLANNING DEPARTMENT

PLAN OF PROPOSED SUBDIVISION
 PART LOT 20, CONCESSION 2,
 TOWN OF THE BLUE MOUNTAINS
 COUNTY OF GREY

DESIGN L.S.H. SCALE HOR. 1:1000
 DRAWN L.S.H. REVIEWED SHEET No. 1410-209-S
 DATE 23 APR 2014

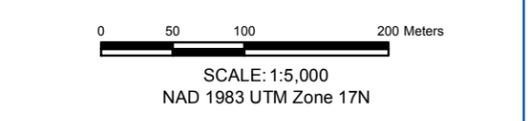
N:\Markham4 - Projects\MapPherson_BuilderHome Farm\209.40019.01_Home Farm\3.Data & Analysis\2.GIS1.MXD\3.WRK\209_40019_TER_ExistingConditions.mxd



LEGEND

- Amphibian Survey Point
- Breeding Bird Survey Point
- Butternut (Species at Risk)
- Groundwater Indicator
- Wildlife
- Study Area
- Cartographic Wetland
- Provincially Significant Wetland
- Upland Forest
- Wetland
- Thickets and Woodlands
- Meadow and Disturbed Area
- Waterbodies
- Flow Observed in 2011
- Flow Observed in 2012, 2014
- Intermittent Watercourse
- Permanent Watercourse
- Contour (1 m)
- Railway

Code	Common Name	Scientific Name
<i>Species At Risk</i>		
JUGCINE	Butternut	<i>Juglans cinerea</i>
EAWP	Eastern Wood Pewee	<i>Contopus virens</i>
<i>Area Sensitive Breeding Birds</i>		
SETRUT	American Redstart	<i>Setophaga ruticilla</i>
<i>Groundwater Indicator</i>		
CARSCAB	Rough Sedge	<i>Carex scabrata</i>
NASOFFI	Water-cress	<i>Nasturtium officinale</i>
seep	Sight record of water seepage	N/A



ELC Code	Polygon ID	ELC Description	Area (Ha)	Area (Ha) to be Removed by Site Design	Area (Ha) to be Retained by Site Design	% Removed by Site Design
Upland Forest						
FODM6-1	15a	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.59	0.00	0.59	0
FODM6-1	15b	Dry - Fresh White Pine Naturalized Coniferous Plantation	0.45	0.45	0.003	99
FODM3-1	9a	Dry - Fresh Poplar Deciduous Forest Type	0.48	0.48	0.00	100
FODM3-1	9b	Dry - Fresh Poplar Deciduous Forest Type	1.29	0.00	1.29	0
FODM3-1	9c	Dry - Fresh Poplar Deciduous Forest Type	0.30	0.00	0.30	0
FODM5-10	20	Dry - Fresh Sugar Maple - Trembling Aspen Deciduous Forest	1.70	0.00	1.70	0
FODM5-2	21a	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.27	0.00	0.27	0
FODM5-2	21b	Dry - Fresh Sugar Maple - Beech Deciduous Forest	0.71	0.00	0.71	0
FODM5-3	13a	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	1.03	0.00	1.03	0
FODM5-3	13b	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	2.54	0.00	2.54	0
FODM5-3	13c	Dry - Fresh Sugar Maple - Red Oak Deciduous Forest	0.5	0.0	0.5	0
FODM5-9	5a	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	0.3	0.0	0.3	0
FODM5-9	5b	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	3.4	0.0	3.4	0
FODM6-1	17	Fresh - Moist Sugar Maple - Green Ash Deciduous Forest	1.0	0.0	1.0	0
FODM7-20	34	Fresh - Moist Lowland Green Ash Deciduous Forest	3.6	0.0	3.6	0
FODM8-1	24	Fresh - Moist Balsam Poplar - Trembling Aspen Deciduous Forest	1.3	0.0	1.3	0
FODM6-1	19	Fresh - Moist Sugar Maple - White Birch - Hemlock Mixed Forest	2.4	0.0	2.4	0
Upland Forest Total			20.3	0.9	20.3	5
Wetland						
MAMM1-3	33	Reed-canary Grass Graminoid Mineral Meadow Marsh	0.2	0.2	0.0	100
SWD3-4	1	Manitoba Maple Mineral Deciduous Swamp	0.4	0.4	0.0	100
SWDM2-2	30	Green Ash Mineral Deciduous Swamp	0.3	0.0	0.3	0
SWTM2-1	8a	Red-osier Dogwood Mineral Deciduous Thicket Swamp	5.1	4.8	0.4	93
SWTM2-1	8b	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.1	0.0	0.1	0
SWTM2-1	8c	Red-osier Dogwood Mineral Deciduous Thicket Swamp	0.2	0.1	0.1	44
SWTM3	23	Willow Mineral Deciduous Thicket Swamp	1.0	0.0	1.0	0
Wetland Total			7.3	5.4	1.8	75
Thickets and Woodlands						
THCM1-20	31	Dry - Fresh Scots Pine Thicket	0.3	0.0	0.3	0
THDM2	2a	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.8	0.8	0.0	100
THDM2	2b	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.4	0.4	0.0	100
THDM2	2c	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	0.5	0.5	0.0	100
THDM2	2d	Dry-Fresh Deciduous Shrub Thicket (Ash, Hawthorn, Apple)	16.8	13.0	3.8	77
THDM2-1	4	Sumach Deciduous Shrub Thicket	2.6	0.0	2.6	0
THDM4-1	32	Green Ash Regeneration Thicket	0.3	0.0	0.3	0
WOD5	14	Fresh - Moist Deciduous Woodland (Green Ash)	1.1	1.1	0.0	100
WODM5-1	16	Fresh - Moist Trembling Aspen - Green Ash Deciduous Woodland	1.9	0.3	1.7	13
Thickets and Woodlands Total			24.8	16.1	8.7	65
Meadow and Disturbed Area						
MEMM3	11a	Dry - Fresh Mixed Meadow	2.2	0.0	2.2	0
MEMM3	11b	Dry - Fresh Mixed Meadow	0.4	0.0	0.4	0
MEMM3	11c	Dry - Fresh Mixed Meadow	0.8	0.0	0.8	0
DIS	35a	Disturbed Area	1.5	0.9	0.6	61
DIS	35b	Disturbed Area	0.9	0.0	0.9	0
Meadow and Disturbed Area Total			5.8	0.9	4.9	16

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

MACPHERSON BUILDERS LTD. (BLUE MOUNTAINS)

NATURAL HERITAGE - EXISTING CONDITIONS AND IMPACT ASSESSMENT REPORT

TERRESTRIAL ENVIRONMENT EXISTING CONDITIONS

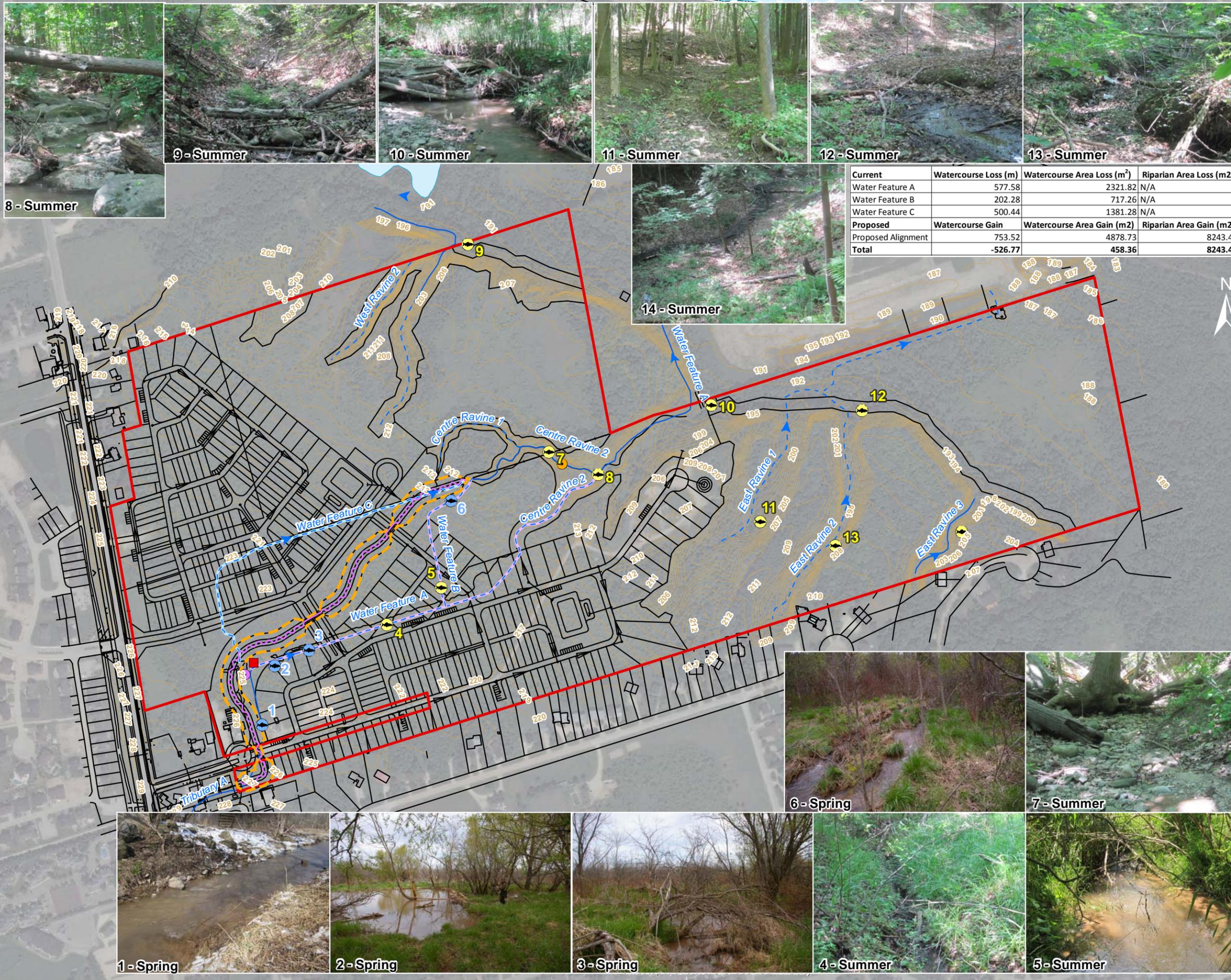
April 15, 2015 Rev **1.0** Figure No. **7**

Project No. 209.40019.00001



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N:\Markham4_P\Projects\MacPherson_Builders\Home Farm\209.40019.01_Home Farm\3.Data & Analysis\GIS\11.MXD\3.WRK\G209_40019_FSH_Watercourses_DFO.mxd



- LEGEND**
- Photo Location - Spring
 - Photo Location - Summer
 - Fisheries/Benthics Sampling Location
 - Benthics Sampling Location
 - Beaver Dam
 - Study Area
 - Waterbody
 - Proposed Channel Re-Alignment Area
 - Proposed Channel Re-Alignment - Watercourse Gain
 - Railway
 - Flow Observed in 2011
 - Flow Observed in 2012, 2014
 - Intermittent Watercourse
 - Permanent Watercourse
 - Contour (1 m)

0 50 100 200 Meters
 SCALE: 1:5,000
 NAD 1983 UTM Zone 17N

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

**MACPHERSON BUILDERS LTD.
 (BLUE MOUNTAINS)**

NATURAL HERITAGE - EXISTING CONDITIONS
 AND IMPACT ASSESSMENT REPORT

**AQUATIC ENVIRONMENT
 EXISTING CONDITIONS**

April 15, 2015	Rev 1.0	Figure No.
Project No. 209.40019.00000		8



APPENDIX A
MNR Communication Record

Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000

From: Benvenuti, Jodi (MNR) [jodi.benvenuti@ontario.ca]

Sent: June 30, 2014 12:16 PM

To: Robin Raven

Subject: RE: SAR Request

Hi Robin,

Thank you for the information you provided below.

I have also screened this location and based on the existing habitat on site and known species at risk in the broader area, I would suggest that the following species have the greatest potential to be present:

- Butternut (END) – as noted below it is found on site

- Northern Myotis (END) – also known as Northern Long-eared Bat

- Barn Swallow - if barns are present on site (THR)

- Milksnake (SC)

- Canada Warbler (SC)

Jodi Benvenuti

Management Biologist

Ministry of Natural Resources

Midhurst District

Phone: (705) 725-7513

From: Findlay, Graham (MNR)

Sent: June-30-14 2:37 PM

To: Benvenuti, Jodi (MNR)

Subject: FW: SAR Request

Graham Findlay

Management Biologist

Huronian Area, Midhurst, MNR

(705) 725-7530

(705) 725-7584 fax

graham.findlay@ontario.ca<<mailto:graham.findlay@ontario.ca>>

From: Robin Raven [<mailto:rraven@slrconsulting.com>]

Sent: June 16, 2014 5:36 PM

To: Findlay, Graham (MNR)

Subject: SAR Request

Dear Mr. Findlay,

I would like to submit a Species at Risk information request for a property in Blue Mountains, ON. Attached is a map of the study area and the associated ELC designations. The study area has plans for development (housing/community). The following table is a list of possible SAR in the area (desktop and field investigations).

SARO Near Study Area (From Grey Region List and NHIC database)

Rank

Barn Swallow

Threatened

Bobolink

Threatened

Butternut (Within Study Area and also observed on site)

Endangered

Eastern Meadowlark

Threatened

Loggerhead Shrike

Endangered

Louisiana Waterthrush (South of Study Area)

Special Concern

Eastern Ribbon Snake

Special Concern

Massasauga Rattlesnake

Threatened

Milk Snake

Special Concern

Northern Map Turtle

Special Concern

Snapping Turtle

Special Concern

Northern Long-eared Bat (South East of Study Area)

Endangered

If any further information is required feel free to contact me.

Thank you for your time,

Robin

Robin Raven

Environmental Technician

SLR Consulting (Canada) Ltd.

Email:

rraven@slrconsulting.com<mailto:rraven@slrconsulting.com>

Office:

905-415-7248

Suite 101, 260 Town Centre Blvd., Markham, ON, L3R 8H8, Canada

www.slrconsulting.com<http://www.slrconsulting.com>

[cid:imagecf6366.JPG@b3337751.4cb5d29e]

Confidentiality Notice and Disclaimer

This communication and any attachment(s) contain information which is confidential and may also be legally privileged. It is intended for the exclusive use of the recipient(s) to whom it is addressed. If you have received this communication in error, please email us by return mail and then delete the email from your system together with any copies of it. Any views or opinions are solely those of the author and do not represent those of SLR Management Ltd, or any of its subsidiaries, unless specifically stated.

APPENDIX B
Plant Species List

Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000

Family / Species	Common Name	Status	ELC Community Class			
			ME, TH, WO	FO	MA, SW	ESG, 2002*
PTERIDOPHYTA	FERNS AND ALLIES					
<u>PTERIDACEAE</u>	<u>MAIDENHAIR FERN FAMILY</u>					
<i>Adiantum pedatum</i> L.	Northern Maidenhair Fern					x
<u>DRYOPTERIDACEAE</u>	<u>WOOD FERN FAMILY</u>					
<i>Cystopteris bulbifera</i> (L.) Bern.	Bulblet Fern					x
<i>Dryopteris marginalis</i> (L.) Gray	Marginal Wood Fern			x		
<i>Matteuccia struthiopteris</i> (L.) Todaro	American Ostrich Fern			x		
<u>DENNSTAEDTIACEAE</u>	<u>BRACKEN FAMILY</u>					
<i>Pteridium aquilinum</i> (L.) Kuhn	Eastern Bracken		x	x		
<u>EQUISETACEAE</u>	<u>HORSETAIL FAMILY</u>					
<i>Equisetum arvense</i> L.	Field Horsetail		x	x	x	
<i>Equisetum hyemale</i> L.	Scouring-rush			x	x	
<i>Equisetum variegatum</i> Schleich.	Variiegated Scouring-rush					x
GYMNOSPERMAE	CONIFERS					
<u>CUPRESSACEAE</u>	<u>CYPRESS FAMILY</u>					
<i>Juniperus communis</i> L.	Common Juniper		x			
<i>Juniperus virginiana</i> L.	Red Cedar		x			
<i>Thuja occidentalis</i> L.	White Cedar		x			
<u>PINACEAE</u>	<u>PINE FAMILY</u>					
<i>Abies balsamea</i> (L.) Mill.	Balsam Fir					x
<i>Picea abies</i> (L.) Karst.	Norway Spruce	+	x			
<i>Picea glauca</i> (Moench) Voss	White Spruce		x			
<i>Pinus strobus</i> L.	White Pine			x		
<i>Pinus sylvestris</i> L.	Scots Pine	+	x			
<u>TAXACEAE</u>	<u>YEW FAMILY</u>					
<i>Taxus canadensis</i> Marsh.	American Yew					x
LILIOPSIDA	MONOCOTS					
<u>CYPERACEAE</u>	<u>SEDGE FAMILY</u>					
<i>Carex aurea</i> Nutt.	Golden Fruited Sedge				x	
<i>Carex bebbii</i> (Bailey) Fern.	Bebb's Sedge				x	
<i>Carex blanda</i> Dew.	Woodland Sedge		x	x		
<i>Carex eburnea</i> Boott	Bristle leaved Sedge		x			
<i>Carex gracillima</i> Schw.	Graceful Sedge		x	x		
<i>Carex pennsylvanica</i> Lam.	Pennsylvanica Sedge			x		
<i>Carex plantaginea</i> Lam.	Plantain-leaved Sedge					x
<i>Carex radiata</i>	Radiating Sedge		x			
<i>Carex scabrata</i> Schw.	Rough Sedge		x			
<i>Carex spicata</i> Huds.	Sedge	+	x			
<i>Carex stricta</i> Lam.	Tussock Sedge					x
<i>Carex vulpinoidea</i> Michx.	Fox Tail Sedge				x	
<i>Scirpus atrovirens</i> Willd.	Black Bulrush				x	
<i>Scirpus validus</i> Vahl.	Softstem Bulrush				x	
<u>JUNCACEAE</u>	<u>RUSH FAMILY</u>					
<i>Juncus canadensis</i> La Harpe	Canada Rush				x	
<i>Juncus effusus</i> L.	Rush				x	
<i>Juncus tenuis</i> Willd.	Path Rush		x		x	
<u>LILIACEAE</u>	<u>LILY FAMILY</u>					
<i>Asparagus officinalis</i> L.	Garden Asparagus	+	x			
<i>Clintonia borealis</i> (Ait.) Raf.	Bluebead-lily			x		
<i>Maianthemum canadense</i> Desf.	Canada Mayflower			x	x	
<i>Maianthemum racemosum</i> (L.) Link	False Solomon's-seal			x		
<i>Maianthemum stellatum</i> (L.) Link	Starry False Solomon's-seal		x	x		
<i>Trillium grandiflorum</i> (Michx.) Salisb.	White Trillium		x	x		
<i>Uvularia grandiflora</i> Sm.	Large Bellwort			x		
<u>ORCHIDACEAE</u>	<u>ORCHID FAMILY</u>					
<i>Epipactis helleborine</i> (L.) Crantz	Helleborine	+		x		
<u>POACEAE</u>	<u>GRASS FAMILY</u>					
<i>Agrostis gigantea</i> Roth.	Redtop	+	x		x	
<i>Andropogon gerardii</i> Vitm.	Big Bluestem					x
<i>Bromus inermis</i> Leyss.	Smooth Brome Grass	+	x			
<i>Calamagrostis canadensis</i> (Michx.) Beauv.	Canada Blue-joint				x	
<i>Danthonia spicata</i> (L.) R. & S.	Poverty Oat Grass		x			

Family / Species	Common Name	Status	ELC Community Class			
			ME, TH, WO	FO	MA, SW	ESG, 2002*
<i>Elymus hystrix</i> L.	Bottle-brush Grass			x		
<i>Festuca obtusa</i> Biehl.	Nodding Fescue			x		
<i>Glyceria grandis</i> S. Wats.	Tall Manna Grass				x	
<i>Glyceria striata</i> (Lam.) A.S. Hitchc.	Fowl Manna Grass				x	
<i>Leersia oryzoides</i> (L.) Sw.	Cut Grass				x	
<i>Muhlenbergia mexicana</i> (L.) Trin.	Muhly Grass				x	
<i>Oryzopsis racemosa</i> (Sm.) Hitchc.	Mountain-rice					x
<i>Phleum pratense</i> L.	Timothy	+	x			
<i>Poa compressa</i> L.	Canada Blue Grass					x
<i>Poa palustris</i> L.	Fowl Meadow Grass		x			
<i>Poa pratensis</i> L.	Kentucky Blue Grass	+	x			
<u>TYPHACEAE</u>	<u>CATTAIL FAMILY</u>					
<i>Typha angustifolia</i> L.	Narrow-leaved Cattail				x	
<i>Typha latifolia</i> L.	Common Cattail				x	
MAGNOLIOPSIDA	DICOTS					
<u>ACERACEAE</u>	<u>MAPLE FAMILY</u>					
<i>Acer negundo</i> L.	Manitoba Maple		x		x	
<i>Acer saccharum</i> Marsh.	Sugar Maple		x	x		
<u>ANACARDIACEAE</u>	<u>CASHEW FAMILY</u>					
<i>Rhus radicans</i> L.	Poison-ivy		x	x		
<i>Rhus typhina</i> L.	Staghorn Sumac		x			
<u>APIACEAE</u>	<u>CARROT FAMILY</u>					
<i>Cicuta bulbifera</i> L.	Bulbous Water-hemlock				x	
<i>Cicuta maculata</i> L.	Spotted Water-hemlock				x	
<i>Daucus carota</i> L.	Wild Carrot, Queen Anne's Lace	+	x			
<u>APOCYNACEAE</u>	<u>DOGBANE FAMILY</u>					
<i>Apocynum androsaemifolium</i> L.	Spreading Dogbane		x			
<u>ARISTOLOCHIACEAE</u>	<u>BIRTHWORT FAMILY</u>					
<i>Asarum canadense</i> L.	Wild Ginger			x		
<u>ASCLEPIADACEAE</u>	<u>MILKWEED FAMILY</u>					
<i>Asclepias syriaca</i> L.	Common Milkweed		x			
<u>ASTERACEAE</u>	<u>ASTER FAMILY</u>					
<i>Achillea millefolium</i> L.	Yarrow	+	x			
<i>Ambrosia artemisiifolia</i> L.	Common Ragweed		x			
<i>Arctium minus</i> (Hill) Bernh.	Common Burdock	+	x			
<i>Aster cordifolius</i> L.	Heart-leaved Aster					x
<i>Aster eriocoides</i> L.	Heath Aster		x			
<i>Aster lanceolatus</i> Willd.	Tall White Aster		x		x	
<i>Aster lateriflorus</i> (L.) Britt.	One-sided Aster					x
<i>Aster novae-angliae</i> L.	New England Aster		x			
<i>Aster puniceus</i> L.	Red-stemmed Aster				x	
<i>Bidens frondosa</i> L.	Devil's Beggarticks				x	
<i>Centaurea maculosa</i> Lam.	Spotted Knapweed	+	x			
<i>Cichorium intybus</i> L.	Chickory	+	x			
<i>Cirsium arvense</i> (L.) Scop.	Canada Thistle	+	x			
<i>Cirsium vulgare</i> (Savi) Tenore	Bull Thistle	+	x			
<i>Eupatorium maculatum</i> L.	Spotted Joe-Pye Weed				x	
<i>Eupatorium rugosum</i> Houtt.	White Snakeroot					x
<i>Euthamia graminifolia</i> (L.) Nutt.	Narrow-leaf Goldenrod		x		x	
<i>Hieracium pilosella</i> L.	Mouse-eared Hawkweed	+	x			
<i>Inula helenium</i> L.	Elecampane	+	x		x	
<i>Lapsana communis</i> L.	Nipplewort	+	x	x		
<i>Solidago caesia</i> L.	Blue-stem Goldenrod			x		
<i>Solidago canadensis</i> L.	Canada Goldenrod		x			
<i>Solidago flexicaulis</i> L.	Zig-zag Goldenrod			x		
<i>Solidago gigantea</i> Ait.	Late Goldenrod				x	
<i>Solidago nemoralis</i> Ait.	Gray Goldenrod		x			
<i>Solidago rugosa</i> Ait.	Rough Goldenrod				x	
<i>Tragopogon dubius</i> Scop.	Goat's-beard	+	x			
<i>Tussilago farfara</i> L.	Coltsfoot	+	x		x	
<u>BALSAMINACEAE</u>	<u>TOUCH-ME-NOT-FAMILY</u>					
<i>Impatiens capensis</i> Meerb.	Spotted Jewelweed		x	x	x	
<u>BERBERIDACEAE</u>	<u>BARBERRY FAMILY</u>					
<i>Berberis vulgaris</i> L.	Common Barberry	+				x
<i>Caulophyllum thalictroides</i> (L.) Michx.	Blue Cohosh			x		
<u>BETULACEAE</u>	<u>BIRCH FAMILY</u>					

Family / Species	Common Name	Status	ELC Community Class			
			ME, TH, WO	FO	MA, SW	ESG, 2002*
<i>Betula papyrifera</i> Marsh.	Paper Birch		x	x		
<i>Ostrya virginiana</i> (Mill.) K. Koch	Hop Hornbeam			x		
<u>BORAGINACEAE</u>	<u>BORAGE FAMILY</u>					
<i>Echium vulgare</i> L.	Viper's-bugloss	+	x			
<i>Myosotis scorpioides</i> L.	True Forget-me-not	+	x			
<u>BRASSICACEAE</u>	<u>MUSTARD FAMILY</u>					
<i>Alliaria petiolata</i> (Bieb.)Cavara & Grande	Garlic Mustard	+	x	x		
<i>Cardamine diphylla</i> (Michx.) Alph. Wood	Toothwort			x		
<i>Cardamine cf. pennsylvanica</i> Muhl.	Bitter Cress			x		
<i>Nasturtium microphyllum</i> (Boenn.) Reichb.	Water Cress	+			x	
<u>CAPRIFOLIACEAE</u>	<u>HONEYSUCKLE FAMILY</u>					
<i>Lonicera dioica</i> L.	Wild Honeysuckle		x	x		
<i>Lonicera tatarica</i> L.	Tartarian Honeysuckle	+	x	x		
<i>Sambucus racemosa</i> L.	Red-berried Elder			x		
<i>Triosteum aurantiacum</i> Bickn.	Wild Coffee			x		
<i>Viburnum lantanoides</i>	Hobble Bush			x		
<i>Viburnum lentago</i> L.	Nannyberry		x		x	
<i>Viburnum trilobum</i> Marsh.	Highbush-cranberry				x	
<u>CARYOPHYLLACEAE</u>	<u>PINK FAMILY</u>					
<i>Dianthus armeria</i> L.	Deptford Pink	+	x			
<i>Saponaria officinalis</i> L.	Bouncing-bet	+	x			
<i>Silene vulgaris</i> (Moench) Garcke	Bladder Champion	+	x			
<u>CELASTRACEAE</u>	<u>STAFF-TREE FAMILY</u>					
<i>Celastrus scandens</i> L.	Climbing Bittersweet		x			
<u>CORNACEAE</u>	<u>DOGWOOD FAMILY</u>					
<i>Cornus alternifolia</i> L.f.	Alternate-leaved Dogwood			x		
<i>Cornus amomum</i> Mill.	Silky Dogwood		x		x	
<i>Cornus rugosa</i> Lam.	Round-leaved Dogwood		x			
<i>Cornus stolonifera</i> Michx.	Red-osier Dogwood		x		x	
<u>CUCURBITACEAE</u>	<u>GOURD FAMILY</u>					
<i>Echinocystis lobata</i> (Michx.) T. & G.	Wild Cucumber				x	
<u>ELAEOAGNACEAE</u>	<u>OLEASTER FAMILY</u>					
<i>Shepherdia canadensis</i> (L.) Nutt.	Soapberry, Buffaloberry		x			
<u>FAGACEAE</u>	<u>BEECH FAMILY</u>					
<i>Fagus grandifolia</i> Ehrh.	American Beech			x		
<i>Quercus rubra</i> L.	Red Oak		x	x		
<u>FABACEAE</u>	<u>PEA FAMILY</u>					
<i>Amphicarpaea bracteata</i> (L.) Fern.	Hog-peanut			x	x	
<i>Lathyrus latifolius</i> L.	Everlasting Pea	+	x			
<i>Lotus corniculatus</i> L.	Bird-foot Trefoil	+	x			
<i>Medicago sativa</i> L.	Alfalfa	+	x			
<i>Melilotus alba</i> Medic.	White Sweet-clover	+	x			
<i>Robinia pseudoacacia</i> L.	Black Locust	+				x
<i>Trifolium pratense</i> L.	Red Clover	+	x			
<i>Vicia cracca</i> L.	Bird Vetch	+	x			
<u>GERANIACEAE</u>	<u>GERANIUM FAMILY</u>					
<i>Geranium robertianum</i> L.	Herb Robert	+				x
<u>GROSSULARIACEAE</u>	<u>GOOSEBERRY FAMILY</u>					
<i>Ribes cynosbati</i> L.	Prickly Gooseberry		x			
<i>Ribes triste</i> Pall.	Swamp Red Currant					x
<u>HYDROPHYLLACEAE</u>	<u>WATERLEAF FAMILY</u>					
<i>Hydrophyllum canadense</i> L.	Canada Waterleaf			x		
<i>Hydrophyllum virginianum</i> L.	Virginia Waterleaf			x		
<u>HYPERICACEAE</u>	<u>ST. JOHN'S-WORT FAMILY</u>					
<i>Hypericum perforatum</i> L.	Common St. John's-wort	+	x			
<u>JUGLANDACEAE</u>	<u>WALNUT FAMILY</u>					
<i>Juglans cinerea</i> L.	Butternut	END	x	x		
<u>LAMIACEAE</u>	<u>MINT FAMILY</u>					
<i>Clinopodium vulgare</i>	Wild Basil		x	x		
<i>Leonurus cardiaca</i> L.	Motherwort	+	x			
<i>Mentha arvensis</i> L.	Field or Common Mint		x		x	
<i>Mentha spicata</i> L.	Spearmint	+			x	
<i>Monarda fistulosa</i> L.	Wild Bergamot		x			
<i>Prunella vulgaris</i> L.	Heal-all	+	x	x	x	
<u>LYTHRACEAE</u>	<u>LOOSESTRIFE FAMILY</u>					
<i>Lythrum salicaria</i> L.	Purple Loosestrife	+			x	

Family / Species	Common Name	Status	ELC Community Class			
			ME, TH, WO	FO	MA, SW	ESG, 2002*
<u>MORACEAE</u>	<u>MULBERRY FAMILY</u>					
<i>Morus alba</i> L.	White Mulberry	+	x			
<u>OLEACEAE</u>	<u>OLIVE FAMILY</u>					
<i>Fraxinus americana</i> L.	White Ash			x		
<i>Fraxinus nigra</i> Marsh.	Black Ash		x	x		
<i>Fraxinus pennsylvanica</i> Marsh.	Green Ash		x	x	x	
<u>ONAGRACEAE</u>	<u>EVENING-PRIMROSE FAMILY</u>					
<i>Epilobium hirsutum</i> L.	Hairy Willowherb	+			x	
<u>OROBANCHACEAE</u>	<u>BROOM-RAPE FAMILY</u>					
<i>Epifagus virginiana</i> (L.) Bart.	Beech-drops					x
<u>OXALIDACEAE</u>	<u>WOOD-SORREL FAMILY</u>					
<i>Oxalis stricta</i> L.	Common Yellow Wood-sorrel	+			x	
<u>PLANTAGINACEAE</u>	<u>PLANTAIN FAMILY</u>					
<i>Plantago lanceolata</i> L.	English Plantain	+	x			
<u>POLYGONACEAE</u>	<u>BUCKWHEAT FAMILY</u>					
<i>Rumex crispus</i> L.	Curly Dock	+	x		x	
<u>PRIMULACEAE</u>	<u>PRIMROSE FAMILY</u>					
<i>Lysimachia ciliata</i> L.	Fringed Loosestrife		x		x	
<u>PYROLACEAE</u>	<u>WINTERGREEN FAMILY</u>					
<i>Monotropa uniflora</i> L.	Indian Pipe			x		
<u>RANUNCULACEAE</u>	<u>BUTTERCUP FAMILY</u>					
<i>Actaea pachypoda</i> Ell.	White Baneberry			x		
<i>Actaea rubra</i> (Ait.) Willd.	Red Baneberry			x		
<i>Anemone acutiloba</i> (DC.) G. Lawson	Sharp-lobed Hepatica			x		
<i>Anemone canadensis</i> L.	Canada Anemone					x
<i>Anemone virginiana</i> L.	Thimbleweed		x			
<i>Ranunculus abortivus</i> L.	Kidney-leaved Buttercup			x		
<i>Ranunculus acris</i> L.	Tall Buttercup	+	x		x	
<u>RHAMNACEAE</u>	<u>BUCKTHORN FAMILY</u>					
<i>Rhamnus cathartica</i> L.	Common Buckthorn	+	x			
<u>ROSACEAE</u>	<u>ROSE FAMILY</u>					
<i>Amelanchier laevis</i> Wieg.	Serviceberry		x			
<i>Crataegus cf. Holmesiana</i> Ashe	Holmes Hawthorn		x			
<i>Crataegus pedicellata</i> Sarg.	Scarlet Thorn		x			
<i>Crataegus punctata</i> Jacq.	Dotted Hawthorn		x			
<i>Fragaria virginiana</i> Dcne.	Common Strawberry		x			
<i>Geum aleppicum</i> Jacq.	Yellow Avens		x		x	
<i>Geum canadense</i> Jacq.	White Avens					x
<i>Malus pumila</i> Miller	Apple	+	x			
<i>Potentilla recta</i> L.	Rough-fruited Cinquefoil	+	x			
<i>Prunus avium</i> L.	Sweet Cherry	+	x			
<i>Prunus serotina</i> Ehrh.	Black Cherry			x		
<i>Prunus virginiana</i> L.	Choke Cherry		x	x		
<i>Pyrus communis</i> L.	Pear	+	x			
<i>Rosa canina</i> L.	Dog Rose	+	x			
<i>Rubus idaeus</i> L.	Wild Red Raspberry		x			
<i>Rubus occidentalis</i> L.	Black Raspberry					x
<u>RUBIACEAE</u>	<u>MADDER FAMILY</u>					
<i>Galium palustre</i> L.	Marsh Bedstraw				x	
<u>SALICACEAE</u>	<u>WILLOW FAMILY</u>					
<i>Populus balsamifera</i> L.	Balsam Poplar		x	x		
<i>Populus deltoides</i> Marsh	Cottonwood		x			
<i>Populus grandidentata</i> Michx.	Large-toothed Aspen			x		
<i>Populus tremuloides</i> Michx.	Trembling Aspen		x	x		
<i>Salix alba</i> L.	White Willow	+	x		x	
<i>Salix amygdaloides</i> Anderss.	Peach-leaved Willow				x	
<i>Salix bebbiana</i> Sarg.	Bebb's Willow				x	
<i>Salix discolor</i> Muhl.	Pussy Willow				x	
<i>Salix eriocephala</i> Michx.	Heart-leaved Willow				x	
<u>SCROPHULARIACEAE</u>	<u>FIGWORT FAMILY</u>					
<i>Verbascum thapsus</i> L.	Common Mullein	+	x			
<i>Veronica anagallis-aquatica</i> L.	Water-speedwell	+			x	
<i>Veronica officinalis</i> L.	Common Speedwell	+		x		
<u>SOLANACEAE</u>	<u>NIGHTSHADE FAMILY</u>					
<i>Solanum dulcamara</i> L.	Bittersweet Nightshade	+			x	
<u>TILIACEAE</u>	<u>LINDEN FAMILY</u>					

Family / Species	Common Name	Status	ELC Community Class			
			ME, TH, WO	FO	MA, SW	ESG, 2002*
<i>Tilia americana</i> L. <u>ULMACEAE</u>	Basswood <u>ELM FAMILY</u>			x		
<i>Ulmus americana</i> L. <u>VERBENACEAE</u>	American Elm <u>VERVAIN FAMILY</u>		x	x		
<i>Verbena hastata</i> L. <i>Verbena urticifolia</i> L. <u>VIOLACEAE</u>	Blue Vervain White Vervain <u>VIOLET FAMILY</u>		x	x	x	
<i>Viola pubescens</i> Ait. <u>VITACEAE</u>	Downy Yellow Violet <u>GRAPE FAMILY</u>		x			
<i>Parthenocissus inserta</i> (A. Kerner) Fritsch	Virginia Creeper		x			
<i>Vitis riparia</i> Michx.	Riverbank Grape		x			

+ Non-native species

* Species reported by ESG International Inc.(2002) for the subject property, but not observed during SLR investigations.

ELC Community Series Legend

ME: Meadow
 TH: Thicket
 WO: Woodland
 FO: Forest
 MA: Marsh

APPENDIX C
Bird Species List

Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000



APPENDIX C

Bird Species List

Common Name	Scientific Name	Status					16-Jun-12						2-Jul-12							
		Species at Risk (national) ^a	Species at Risk (provincial) ^a	Provincially Rare (breeding season SRANK) ^b	Regional Status	Area-sensitive (OMNR)	Confirmed Breeding	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Total
American Crow	<i>Corvus brachyrhynchos</i>						y	2	1	2	1	2			1					9
American Goldfinch	<i>Carduelis tristis</i>						y	1	8			4		3	5	1		4		26
American Redstart	<i>Setophaga ruticilla</i>				A		y			1	1	1				1		1		5
American Robin	<i>Turdus migratorius</i>						y		2		1	1		1	3				1	9
American Tree Sparrow	<i>Spizella arborea</i>									y									2	2
American Woodcock	<i>Scolopax minor</i>												1							1
Baltimore Oriole	<i>Icterus galbula</i>												1							1
Black-capped Chickadee	<i>Poecile atricapillus</i>						y			5	3	1	2	1	1			1	3	17
Black-throated Green Warb	<i>Dendroica virens</i>				A										1					1
Blue Jay	<i>Cyanocitta cristata</i>						y	1				2		2						5
Cedar Waxwing	<i>Bombycilla cedrorum</i>						y	2	2			2	1		4			1	1	13
Chipping Sparrow	<i>Spizella passerina</i>													3						3
Common Grackle	<i>Quiscalus quiscula</i>						y	6				3				6				15
Common Raven	<i>Corvus corax</i>						y						1	2						3
Common Yellowthroat	<i>Geothlypis trichas</i>						y	2				1		2						5
Downy Woodpecker	<i>Picoides pubescens</i>									1	1									2
Eastern Kingbird	<i>Tyrannus tyrannus</i>													1					1	2
Eastern Wood-Pewee	<i>Cantopus virens</i>	SC	SC				y			1	1		1				1			4
Field Sparrow	<i>Spizella pusilla</i>						y		1					1	1			1	1	5
Gray Catbird	<i>Dumetella carolinensis</i>														1				1	2
Great Crested Flycatcher	<i>Myiarchus crinitus</i>												1			1				2
Hairy Woodpecker	<i>Picoides villosus</i>				A										1	1				2
Indigo Bunting	<i>Passerina cyanea</i>						y	1				1	1		1					4
Killdeer	<i>Charadrius vociferus</i>											1								1
Northern Cardinal	<i>Cardinalis cardinalis</i>														1	1	1			3
Northern Flicker	<i>Colaptes auratus</i>						y				1									1
Pileated Woodpecker	<i>Dryocopus pileatus</i>				A								1							1
Red-eyed Vireo	<i>Vireo olivaceus</i>						y	1		2	4	3			1	2	5	1		19
Red-winged Blackbird	<i>Agelaius phoeniceus</i>						y	2										1		3
Ring-billed Gull	<i>Larus delawarensis</i>																	1		1
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>									1										1
Ruby-throated Hummingbir	<i>Archilochus colubris</i>																	1		1
Song Sparrow	<i>Melospiza melodia</i>						y	3	3			2		3	2			4		17
Swamp Sparrow	<i>Melospiza georgiana</i>							1												1
Veery	<i>Catharus fuscescens</i>				A												1			1
White-breasted Nuthatch	<i>Sitta carolinensis</i>				A		y	1										1		2
Willow Flycatcher	<i>Empidonax traillii</i>							2												2
Yellow Warbler	<i>Dendroica petechia</i>						y	1	1		1	2		1						6
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>				A				2										2	4
Yellow-throated Vireo	<i>Vireo flavifrons</i>				A														1	1
Total								26	21	10	14	27	8	23	22	13	11	16	12	

Number of Species: 40

Number of (provincial and national) Species at Risk: 1

Number of S1 to S3 (provincially rare) Species: 0

Number of Regionally Rare Species: 0

Number of Area-sensitive Species: 8

^a National Species at Risk are those listed by COSEWIC = Committee on the Status of Endangered Wildlife in Canada

Provincial Species at Risk are those listed by COSSARO = Committee on the Status of Species at Risk in Ontario

END = Endangered, THR = Threatened, SC = Special Concern (formerly Vulnerable)

^b SRANK (from Natural Heritage Information Centre) shown for breeding status if: S1 (extremely rare), S2 (very rare), S3 (rare to uncommon), and SE (exotic, ie introduced)

T (tracked species) that are S4 or S5 are also noted. Species actively tracked generally have fewer than 100 recent occurrences in Ontario,

or are highly ranked globally. SRANK not shown if: S4 (common), S5 (very common), SZB (breeding migrants or vagrants) and SR (reported as breeding, but no persuasive documentation).

Area-sensitive source:

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.

2 = Freemark, K. and B. Collins. 1992. Landscape ecology of birds breeding in temperate forest fragments. pp 443 - 451.

In J.M. Hagen and D.W. Johnston (eds.). Ecology and Conservation of Neotropical Migrant Landbirds. The Manomet Bird Observatory. (forest area-sensitive species only)

3 = Couturier, A. 1999. Conservation Priorities for the Birds of Southern Ontario. Unpublished Bird Studies Canada report, 17 pp (plus appendices).

4 = Riffell, S.K., B.E. Keas, and T.M. Burton. 2001. Area and habitat relationships of birds in Great Lakes coastal wet meadows.

Wetlands Vol. 21 (4): 492-507. (wet meadow species only)

^d Ontario Ministry of Natural Resources (OMNR). 1993 (Revised 1994, 2002 draft). Ontario Wetland Evaluation System, Southern Manual. 3rd Edition. NEST Technical Manual TM-002. 173 pp.

APPENDIX D
Butternut Records

Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000

JUGCINE_ID	UTM		Approx. DBH (cm)	Canker Symptoms	Canopy	Visual Health
	Easting	Northing				
JUGCINE_1	554011	4929664	25	minimal sooty	full	healthy
JUGCINE_2	554011	4929680	15/10	minimal sooty	full	healthy
JUGCINE_12	554041	4929745	10	minimal sooty	full	healthy
JUGCINE_13	554027	4929722	5	none	full	healthy
JUGCINE_14	554534	4929400	60+	none	full	healthy
JUGCINE_15	554549	4929395	80+	none	full	healthy
JUGCINE_16	554539	4929412	30	none	full	healthy
JUGCINE_17	554882	4929455	5	none	full	healthy
JUGCINE_18	554821	4929526	5	minimal sooty	full	healthy
JUGCINE_19	554691	4929580	60+	none	full	healthy
JUGCINE_20	554681	4929576	40	minimal sooty	full	healthy
JUGCINE_21	554674	4929577	30	minimal sooty	full	healthy
JUGCINE_22	554611	4929596	10	minimal sooty	full	healthy
JUGCINE_23	554616	4929600	40	none	full	healthy
JUGCINE_24	554597	4929608	10	minimal sooty	full	healthy
JUGCINE_25	554606	4929596	30	minimal sooty	full	healthy
JUGCINE_26	554801	4929600	15/15	minimal sooty	full	healthy
JUGCINE_27	554607	4929596	10	minimal sooty	full	healthy
JUGCINE_28	554383	4929463	40	minimal sooty	full	healthy
JUGCINE_29	554401	4929465	5	none	full	healthy
JUGCINE_31	554303	4929746	100+	none	near full	healthy
JUGCINE_32	554291	4929749	150+	none	near full	healthy

APPENDIX E
Significant Wildlife Habitat Screening

Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000

Appendix E: Identification of Significant Wildlife Habitat

The Provincial Policy Statement 2014 (PPS) states that Development and site alteration shall not be permitted in Significant Wildlife Habitat (SWH) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. It is the responsibility of the local planning authority to designate SWH however few municipalities have undertaken the substantial effort required to reflect the local priorities. The Significant Wildlife Habitat Technical Guide (OMNRF 2000) and Decision Support Criteria were developed to support planners in determining whether SWH could be affected by proposals for land use change in the context of the Planning Act.

The Town of the Blue Mountains, Ontario has not identified SWH. The Town is located within Ecoregion 6E for which criteria are provided. This screening compares conditions within the Home Farm study area to those criteria in order to identify the potential for SWH and to avoid or mitigate negative impacts.

The PPS (2014) provides the following definitions:

Wildlife habitat: means areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species. (PPS, 2014)

Significant Wildlife Habitat, in the context of PPS Section 2.1 refers to features that are “ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or *natural heritage system*”.

SWH are grouped by the OMNRF into four broad categories:

- Seasonal Concentration Areas
- Rare Vegetation Communities or Specialized Habitats for Wildlife
- Habitat for Species of Conservation Concern
- Animal Movement Corridors

The type of the habitat is listed below by category. The threshold for identification as SWH as provided by the SWH Ecoregion 6E Criterion Schedule was then compared to the data collected for the Home Farm lands. A comment follows each category regarding the potential for the feature to occur on or adjacent to the Home Farm lands.

1. Seasonal Concentration Areas

- Winter Deer Yards and/or Congregation Areas
- Nesting Habitat for Colonial Birds (e.g., Herons, Terns, Swallows)
- Waterfowl Stopover and Staging - Aquatic
- Waterfowl Stopover and Staging - Terrestrial
- Waterfowl Nesting
- Shorebird Migratory Stopover and/or Staging
- Landbird Stopover/Staging
- Raptor Wintering Area (Feeding/Roosting)
- Reptile Hibernacula
- Bat Hibernacula
- Bat Maternity Colonies
- Bat Migratory Stopover Areas
- Butterfly Stopover Habitat

Of these features, only landbird stopover/staging is possible on the Home Farm lands. The criteria focus on forests and treed swamps as being of most significance. Treed swamps do not occur however the forested slopes may provide this habitat, and possibly for migrating bats as well. These forests will not be removed by the proposed development therefore this function, if it exists, will remain.

2. Rare Vegetation Communities or Specialized Habitats for Wildlife

2.1. Rare Vegetation Communities

- Alvar
- Prairie
- Savannah
- Rare Vegetation Types and/or Old Growth Forest
- Cliff/Talus
- Rock Barrens
- Sand Barrens
- Great Lake Dunes

The vegetation communities on the Home Farm lands do not include any of these types of vegetation.

2.2. Specialized Habitats for Wildlife

- Waterfowl Nesting
- Mast Areas
- Amphibian Woodland Breeding
- Turtle Nesting

- Specialized Raptor Nesting
- Bald Eagle and/or Osprey Nesting, Foraging and Perching
- Mineral Licks
- Denning Sites
- Seeps and Springs
- Amphibian Breeding Wetlands

Amphibian Calling surveys were undertaken and no amphibians were recorded calling from the wetlands on the property. Calls recorded upstream and downstream of the property identified several species in good numbers. It appears that the habitat on the subject lands are poor candidates for habitat, however the connection between the upstream and downstream locations should be maintained. Incidental observations documented occurrences of Gray Treefrog (*Hyla versicolor*), Northern Leopard Frog (*Lithobates pipiens*), and American Toad (*Anaxyrus americanus*) later in the year when they may have been dispersing.

Seeps were observed at several places on the subject lands, largely associated with the forest at the toe of slope. They can be particularly important if the discharge is of sufficient volume as to keep open water available for deer, grouse and turkey, and they can be important hibernation sites for some frogs and salamanders. The seeps on site are small and freeze during the winter, therefore they fail to provide these important functions. The SWH criteria suggest that sites with 2 or more seeps should be identified as SWH, however no scale is provided (i.e., 2 seeps within a ha? 2 seeps within 10 ha?) therefore this criterion is difficult to apply. Nevertheless, due to the location of the seeps within the forest they will not be removed by the development. Further, hydrogeologic studies indicate that the seeps are not hydrogeologically connected to the surface features where development will occur, therefore the recharge function will not be changed by this development.

3. Habitat for Species of Conservation Concern

- Area Sensitive Breeding Birds: Woodland, Grassland, Wetland, Shrubland
- Endangered Species Act Special Concern & Provincially Rare – Plant Species
- Endangered Species Act Special Concern & Provincially Rare – Other Species
- Marsh Breeding Birds
- Terrestrial Crayfish

No suitable habitat occurs for terrestrial crayfish or for marsh breeding birds.

Six area sensitive species were observed (Table 1). These species are adapted to forested habitats of variable composition. Of these species, only one is a confirmed breeder: American Redstart (*Setophaga ruticilla*). The American Redstart is adapted to open forested habitats.

Table 1 Area Sensitive Bird Species

Common Name	Scientific Name
-------------	-----------------

American Redstart	<i>Setophaga ruticilla</i>
Black-throated Green Warbler	<i>Dendroica virens</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Veery	<i>Catharus fuscescens</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>

In addition, Eastern Wood Pewee (*Contopus virens*), a species of Special Concern in Ontario. All of these records were from the forests located on the slopes that will be conserved as an outcome of this development.

4. Animal Movement Corridors

- Deer Migration corridors
- Amphibian Corridors

No deer migration corridors were identified across the site as the closest Deer Wintering Habitat is more than 8 km to the south.

An Amphibian corridor may exist connecting the habitat identified upstream and downstream of the subject lands. The development proposal intends to preserve a corridor 60m wide with both aquatic habitat as well as wetlands to provide connectivity across the Home Farm lands.

In summary, the candidate SWH for which there is evidence of occurrence on the Home Farm lands includes:

- Area Sensitive Breeding Birds: Woodland
- Endangered Species Act Special Concern
- Amphibian Corridors

APPENDIX F
Instream Barrier

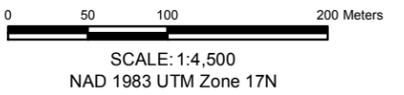
Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000

N:\Markham4_P\Projects\MacPherson_Builders\Home Farm\209.40019.01_Home Farm\3.Data & Analysis\2.GIS\1.MXD\3.WRK\G209_40019_FSH_Barriers.mxd



LEGEND

- Study Area
- Potential Barriers to Fish Passage
- Potential Barriers to Fish Passage with Representative Photos
- Waterbody
- Flow Observed in 2011
- Flow Observed in 2012, 2014
- - - Intermittent Watercourse
- Permanent Watercourse



NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

**MACPHERSON BUILDERS LTD.
 (BLUE MOUNTAINS)**

**NATURAL HERITAGE - EXISTING CONDITIONS
 AND IMPACT ASSESSMENT REPORT**

POTENTIAL INSTREAM BARRIERS

April 15, 2015	Rev 1.0	Appendix
Project No. 209.40019.00000		F



APPENDIX G
Ephemeral Drainage Path

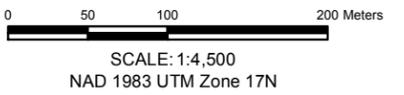
Environmental Impact Study
Town of Blue Mountains, Ontario
SLR Project No.: 209.40019.00000

N:\Markham4_P\Projects\MacPherson_Builders\Home Farm\209.40019.01_Home Farm\3.Data & Analysis\2.GIS\1.MXD\3.WRK\G209_40019_FSH_HistoricWatercourses.mxd



LEGEND

- Study Area
- Waterbody
- Flow Observed in 2011
- - - Flow Observed in 2012, 2014
- · - · - Intermittent Watercourse
- Permanent Watercourse
- Ephemeral Drainage Path: no bed or banks (2011)



NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.
 Basedata: Ontario Ministry of Natural Resources, Land Information Ontario (LIO) © Queen's Printer for Ontario, 2012, Downloaded February 2013
 Orthoimagery: WMS © ESRI Imagery, 2012

MACPHERSON BUILDERS LTD. (BLUE MOUNTAINS)

NATURAL HERITAGE - EXISTING CONDITIONS AND IMPACT ASSESSMENT REPORT

EPHEMERAL DRAINAGE PATH (2011)

April 15, 2015	Rev 1.0	Appendix G
Project No.	209.40019.00000	



Image © 2015 DigitalGlobe

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



global environmental solutions

Calgary, AB

#134, 12143 - 40th Street SE
Calgary, AB T2Z 4E6
Canada

Tel: (403) 266-2030
Fax: (403) 263-7906

Edmonton, AB

6940 Roper Road
Edmonton, AB T6B 3H9
Canada

Tel: (780) 490-7893
Fax: (780) 490-7819

Fort St. John, BC

9943 100th Avenue
Fort St. John, BC V1J 1Y4
Canada

Tel: (250) 785-0969
Fax: (250) 785-0928

Grande Prairie, AB

10015 102 Street.
Grande Prairie, AB T8V 2V5
Canada

Tel: (780) 513-6819
Fax: (780) 513-6821

Halifax, NS

115 Joseph Zatzman Drive
Dartmouth, NS B3B 1N3
Canada

Tel: (902) 420-0040
Fax: (902) 420-9703

Kamloops, BC

8 West St. Paul Street
Kamloops, BC V2C 1G1
Canada

Tel: (250) 374-8749
Fax: (250) 374-8656

Kelowna, BC

200 1475 Ellis Street,
Kelowna, BC V1Y 2A3
Canada

Tel: (250) 762-7202
Fax: (250) 763-7303

Markham, ON

#200-300 Town Centre Blvd
Markham, ON L3R 5Z6
Canada

Tel: (905) 415-7248
Fax: (905) 415-1019

Nanaimo, BC

#9-6421 Applecross Road
Nanaimo, BC V9V 1N1
Canada

Tel: (250) 390-5050
Fax: (250) 390-5042

Prince George, BC

1586 Ogilvie Street,
Prince George, BC V2N 1W9
Canada

Tel: (250) 562-4452
Fax: (250) 562-4458

Regina, SK

1054 Winnipeg Street
Regina, SK S4R 8P8
Canada

Tel: (306) 525-4690
Fax: (306) 525-4691

Saskatoon, SK

#620 – 3530 Millar Avenue
Saskatoon, SK S7P 0B6
Canada

Tel: (306) 374-6800
Fax: (306) 374-6077

Sydney, NS

P.O. Box 791, Station A
122-45 Wabana Court
Sydney, NS B1P 6J1
Canada

Tel: (902) 564-7911
Fax: (902) 564-7910

Vancouver, BC (Head Office)

#200-1620 West 8th Avenue
Vancouver, BC V6J 1V4
Canada

Tel: (604) 738-2500
Fax: (604) 738-2508

Victoria, BC

#6 – 40 Cadillac Avenue
Victoria, BC V8Z 1T2
Canada

Tel: (250) 475-9595
Fax: (250) 475-9596

Winnipeg, MB

Unit D, 1420 Clarence Avenue
Winnipeg, MB R3T 1T6
Canada

Tel: (204) 477-1848
Fax: (204) 475-1649

Yellowknife, NT

Unit 44 – 5022 49th Street
Yellowknife, NT X1A 3R8
Canada

Tel: (867) 765-5695



Energy



Waste Management



Planning & Development



Industry



Mining & Minerals



Infrastructure