Appendix E

2012 Bat Monitoring Report and Environmental Impact Study (NRSI, 2012)

BLUEWATER WIND ENERGY CENTRE
2011 Bat Monitoring Report and Environmental Impact Study

Prepared for:
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Project No. 1075B

Date: March 2012

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

BLUEWATER WIND ENERGY CENTRE
2011 Bat Monitoring Report and Environmental Impact Study

Project Team:

Staff	Role
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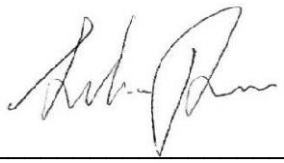
Nathan Miller	Biologist
Tara Lessard	Biologist
Shawn MacDonald	GIS Technician

Report submitted on March 23, 2012



Andrew G. Ryckman

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1.0 Project Description

Natural Resource Solutions Inc. (NRSI) was retained in June 2010 by AECOM, on behalf of NextEra Energy Inc., to conduct a natural environment resource assessment specific to bats and bat habitat, in accordance with the Renewable Energy Approval (REA) regulation. This assessment includes a records review, site investigation, and evaluation of significance and impact assessment of any potentially significant natural features at a proposed 60MW wind energy facility in Huron County and the Municipalities of Bluewater and Huron East, Ontario.

The Bluewater Wind Energy Centre, proposed by NextEra Energy Inc., is located approximately 2.5km southeast of the Town of Bayfield. This wind energy generating facility is proposed to be 60MW in size, consisting of up to 41 operational 1.6MW wind turbines, as well as supporting infrastructure and development activities. This includes access roads, construction areas, connector lines, a transmission line and a substation, temporary laydown areas, and an operation/maintenance building.

As identified the REA regulation, the proposed layout of these features is collectively referred to as the 'project location'. In accordance with Section 25 of the Renewable Energy Approval (REA) Regulation (O. Reg. 359/09 of the Environmental Protection Act), AECOM has conducted a thorough records review of available background resources to identify any potentially significant bat habitats within 120m of the project location. This includes areas within 120m of turbine blade tip as well as any areas that may be used as temporary laydown areas, substation, and operations building. For the purposes of this report, NRSI will refer to the areas within 120m of the project location as the 'project area'.

The project area represents habitat and landscape features typical of a southern Ontario landscape. The approximate boundaries of the area proposed for turbine placement are Mill Road to the north, Bannockburn Line the to the east, Bluewater Highway (Highway 21) to the west, and Danceland Road/ Walnut Road to the south (Figure 1). The project area is dominated by agricultural habitats, including both actively tilled cropland and

pasture. Fallow fields, hedgerows, woodlots, creek valleys and wetlands are also present throughout the project area.

Figure 1

Bluewater Wind Energy Centre: Bat Habitats

Project Area and Natural Features

Natural Resource Solutions Inc.

March 23, 2012
Project: NRSI-1075
Scale: 1:75 000 (11 x 17")
UTM Zone 17 NAD83

Bayfield

Seaforth

Hensall

Legend
- Study Area Boundary
- 120m Buffer
- Project Location
- Laydown Area
- Substation
- Proposed Turbine
- Transmission Line
- Access Road
- Railway
- Highway
- Primary Road
- Local Street
- Watercourse
- Waterbody
- Wetland
- Woodland (LIO)

N

0 1 2 3 Kilometers

Note: The final boundaries of natural features, including bat habitats, are identified within the full Natural Heritage Assessment conducted by AECOM. This map is for general reference only.

Path: X:\1075_Bluewater\NRSI_1075_Fig1_ProjLocationNatFeatures_75K_2012_03_23_SWM.mxd

2.0 REA Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the requirements for the development of renewable energy projects in Ontario. In accordance with the REA Regulation, the project is classified as a Class 4 wind energy generating facility, and is required to complete a Natural Heritage Assessment.

2.1 Records Review

Section 25 of the REA Regulation requires proponents of Class 4 wind projects to undertake a natural heritage records review to identify whether the project location is:

1. in a provincial park or conservation reserve
2. within 120m of a provincial park or conservation reserve
3. in a natural feature
4. within 50m of an area of natural and scientific interest (earth science), or
5. within 120m of a natural feature that is not an area of natural and scientific interest (earth science)

Natural Features are defined in Section 1.1 of the REA Regulation to be all or part of

(a) an area of natural and scientific interest (ANSI) (earth science)
(b) an ANSI (life science)
(c) a coastal wetland
(d) a northern wetland
(e) a southern wetland
(f) a valleyland
(g) a wildlife habitat, or
(h) a woodland.

Subsection 3 of Section 25 of the REA Regulation requires the proponent to prepare a report "setting out a summary of the records searched and the results of the analysis" (O. Reg. 359/09). Dillon Consulting Ltd. has conducted a records review of available background resources to satisfy the conditions of the Regulation.

2.2 Site Investigation

Section 26 of the REA Regulation requires proponents of Class 4 wind projects to undertake a natural heritage site investigation for the purpose of determining:

1. whether the results of the analysis summarized in the [Natural Heritage Records Review] report prepared under subsection 25 (3) are correct or require correction, and identifying any required corrections.
2. whether any additional natural features exist, other than those that were identified in the [Natural Heritage Records Review] report prepared under subsection 25 (3).
3. the boundaries, located within 120m of the project location, of any natural feature that was identified in the records review or the site investigation.
4. the distance from the project location to the boundaries determined under clause (c).

Natural Features, as defined in Section 1.1 of the REA Regulation, are identified in Section 3.1 above.

Subsection 3 of Section 26 of the REA Regulation requires the proponent to prepare a report which includes the following:

1. A summary of any corrections to the report prepared under subsection 25 (3) and the determinations made as a result of conducting the site investigations under subsection (1).
2. Information relating to each natural feature identified in the records review and in the site investigations, including the type, attributes, composition and function of the feature.
3. A map showing
   a) the boundaries mentioned in clause (1) (c)
   b) the location and type of each natural feature identified in relation to the project location, and
   c) the distance mentioned in clause (1) (d).
4. The dates and times of the beginning and completion of the site investigation.
5. The duration of the site investigation.
6. The weather conditions during the site investigation.
7. A summary of methods used to make observations for the purposes of the site investigation.
8. The name and qualifications of any person conducting the site investigation.
9. Field notes kept by the person conducting the site investigation.

This Bat Monitoring Report has been organized and prepared to satisfy the conditions of the requirements outlined above for candidate significant bat habitats.

2.3 Evaluation of Significance

Section 27 of the REA Regulation requires that, if any candidate significant natural feature is identified within 120m of the project location, a natural heritage evaluation of significance should be undertaken. This evaluation of significance should utilize evaluation criteria or procedures established or accepted by the Ministry of Natural Resources. In conjunction with the evaluation of significance, Subsection 4 of Section 27 of the REA Regulation requires that a report be prepared that sets out the following:

1. For each natural feature shown on the map mentioned in paragraph 3 of subsection 26 (3), a determination of whether the natural feature is provincially significant, significant, not significant, or not provincially significant.
2. A summary of the evaluation criteria or procedures used to make the determinations mentioned in paragraph 1.
3. The name and qualifications of any person who applied the evaluation criteria or procedures mentioned in paragraph 2.
4. The dates of the beginning and completion of the evaluation

This Bat Monitoring Report has been organized and prepared to satisfy the requirements of the evaluation of significance for candidate significant bat habitats as outlined in the REA Regulation.

2.4 Environmental Impact Study

Section 38 of the REA Regulation specifies that no development activities shall be permitted within 120m of a significant natural feature unless an environmental impact study report is prepared in accordance with any procedures established by the Ministry of Natural Resources. As per Subsection 2, this report should:

1. Identify and assess any negative environmental effects of the project on a natural feature, provincial park or conservation reserve,
2. Identify mitigation measures in respect of any negative environmental effects mentioned in the subclause above,
3. Describe how the environmental effects monitoring plan…addresses any negative environmental effects mentioned in subclause 1, and
4. Describe how the construction plan report…addresses any negative environmental effects mentioned in subclause 1.

This Bat Monitoring Report has been organized and prepared to satisfy the requirements of the environmental impact study for significant bat habitats as outlined in the REA Regulation.

3.0 Records Review

3.1 Records Review Methodology

In accordance with the REA Regulation, AECOM consulted several information sources and agencies for the purposes of assessing natural features and wildlife habitat within 120m of the project location. The results of this consultation process have been documented in the Bluewater Wind Energy Centre Natural Heritage Assessment (AECOM 2011). In addition, NRSI has consulted several additional information sources specific to bats and bat habitats. The results of these records consulted are listed below in Table 1.

Table 1. Summary of Records Consulted for the Bluewater Wind Energy Centre

Information Source	Consultation Date(s)	Type of Records Reviewed
Ministry of Natural Resources, Land Information Ontario	December 2, 2011	Woodlands Significant Wildlife Habitat
Ministry of Northern Development and Mines, Ontario Geological Survey	December 6, 2011	Significant Wildlife Habitat (Karst of Southern Ontario and Manitoulin Island, Abandoned Mines Information System)
Huron County Official Plan (Amendment No. 3, 2010)	November 25, 2011	Woodlands
Municipality of Bluewater Official Plan (2005)	November 25, 2011	Woodlands
Ministry of Natural Resources, NHIC and Biodiversity Explorer	December 12, 2011	Significant Wildlife Habitat
Atlas of the Mammals of Ontario	November 25, 2011	Significant Wildlife Habitat

3.2 Records Review Results

Based on results of the records review, there are no bat hibernacula, maternity colonies, or migratory stopover locations known from within 120m of the project location. However, there are 22 woodlands within 120m of wind turbines which may be suitable to contain bat maternity colonies.

There are no known abandoned mines within 120m of the project location. However, there is known karst topography overlapping the eastern portion of the project area containing wind turbines. There are known sinkholes within this unit of known karst. Karst is susceptible to the creation of geologic features, such as caves, which may be

suitable for bat hibernacula (OGS 2011). The closest sinkhole to the project location is found approximately 2.75km to the northeast of the access road for turbine 33. Other sinkholes are found approximately 3.25km southeast of turbine 37.

The remainder of the project location is found within areas of inferred karst topography. As a result there are no known features which may be suitable for bat hibernacula within 120m of the project location, but there may be previously unknown features within areas of karst or inferred karst which could provide suitable habitat for bat hibernacula. These features will be considered in the site investigation.

Bat species which are known from the vicinity of the project location include big brown bat (*Eptesicus fuscus*) and eastern red bat (*Lasiurus borealis*) (Dobbyn 1994). No species of conservation concern have been identified from the vicinity of the project location (OMNR 2010a).

Table 2. Summary of Significant Wildlife Habitats Identified Near the Bluewater Wind Energy Centre

Wildlife Habitat Type	Present Within 120m of Project Location	Present Within Project Location	Details	Site Investigation Required
Seasonal Concentration Areas				
Bat Hibernacula	Unknown	Unknown	No abandoned mines, but there is inferred karst topography and karst topography <120m from and overlapping the project location. Site investigation will be conducted to identify any potential caves.	Yes
Bat Maternity Colonies	Unknown	Unknown	Project located <120m from woodlands which may contain suitable trees.	Yes
Species of Conservation Concern				
S1-S3, and SH Species and Communities	No	No	No records of bat species of conservation concern from the vicinity of the project area.	No

4.0 Site Investigation

Comprehensive site investigations to document the environmental and biological characteristics of the Bluewater Wind Energy Centre relating to bats and bat habitats were undertaken in accordance with the REA regulation and the requirements of the MNR. These site-specific field investigations focused on habitat assessments to support and build on the information collected during the records review phase of this project, aiding in identifying candidate significant bat habitats. The results of these site investigations will be used to identify and map the boundaries of wildlife habitats within 120m of the project location. Information collected at this stage will subsequently be used to help evaluate the significance of identified wildlife habitats.

4.1 Site Investigation Methods

4.1.1 Staff Roles

The requirements of the REA Regulation indicate that the name and qualifications of all staff participating in the site investigation should be included. As a result, the qualifications and roles of all staff participating in the site investigations at the Bluewater Wind Energy Centre have been outlined in the following sections.

Andrew G. Ryckman, B.Sc.
Andrew is a Terrestrial and Wetland Biologist with 7 years of environmental experience. He routinely manages the natural heritage aspects of renewable energy projects, with specific expertise relating to bats and herpetofauna. Andrew is certified in Ecological Land Classification (2010), and has successfully completed a Bat Conservation International (BCI) Acoustic Monitoring Workshop (2008).

Andrew's role in the project was to act as the project manager, overseeing all aspects of the site investigation, including all associated field work and reporting. Andrew reviewed photos and habitat descriptions of potentially significant habitats and provided input into habitat characteristics.

Christy Humphrey, B.E.S.

Christy is a Terrestrial and Wetland Biologist with more than 3 years of environmental consulting experience, working on a variety of project tasks. Her primary areas of expertise are vegetation mapping and floral inventories, but she has experience conducting bird and bat assessments, amphibian studies, and other fauna assessments. Christy is certified in both the Ecological Land Classification (ELC) for Southern Ontario (2010) and Northeastern Ecological

Land Classification (2010), and participated in the Ontario MNR Bat Monitoring Workshop for Wind Power Projects (2010).

Christy organized field work to be conducted for the site investigation, and conducted site specific habitat assessments, assessing qualitative characteristics of potential wildlife trees. Christy also compiled, interpreted, and reported on the results of the site investigation.

Andrew Dean, B.E.S.

Andrew is a Terrestrial and Wetland Biologist with 2 years of environmental consulting and not-for-profit work experience, monitoring both for the protection of natural areas within construction projects and for the rehabilitation of former aggregate extraction sites. He has a keen interest in botany and plant ecology and is a member of the Field Botanists of Ontario, the North American Native Plant Society and the Society for Ecological Restoration of Ontario (SERO) and is certified in the Ecological Land Classification (ELC) for Southern Ontario (2011). Andrew has participated in field investigations inventorying flora and fauna, their respective habitats and sensitive natural heritage features.

Andrew conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

Ashley Nathan, M.Sc.

Ashley is a Field Technician with two years of technical experience in environmental consulting and research. Ashley completed her Master of Science in Elementary Education at Medaille College, NY after acquiring her Bachelor of Science degree in Biology with Environmental Science from the University of Western Ontario. Ashley has experience conducting vegetation, mammal, and bird surveys for a variety of environmental projects.

Ashley conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

Brian Watson, F.W.T.

Brian is a Field Biologist with more than one year of work experience in the environmental field. His areas of expertise are fish habitat surveys, fisheries sampling, and environmental monitoring, but he also has experience with benthic invertebrate surveys, bird surveys and tree species identification.

Brian conducted site specific habitat assessments for the Bluewater Wind Energy Centre, including qualitatively assessing the characteristics of potential wildlife trees, as well as quantitatively assessing the number of wildlife trees per hectare within woodlands.

Carolyn Knapper, F.W.T.

Carolyn is a Field Biologist with 8 months of experience as a technician in the environmental field. She has experience monitoring aquatic ecosystems and

conducting mammal and herpetofauna surveys in both the public and private sectors.

Carolyn conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

Charlotte Moore, B.E.S.

Charlotte is a Terrestrial and Wetland Biologist with three field seasons of experience in butterfly ecology and various other environmental projects. Charlotte has completed her Bachelor of Environmental Studies and is a candidate for a Master of Environmental Studies (2013) at the University of Waterloo. Her Masters research will involve measuring the success of past restoration efforts using butterfly abundance and diversity in the riparian zones of several creeks. Other environmental projects Charlotte has worked on include the use of Ecological Land Classification (ELC) and the Ontario Wetland Evaluation System (OWES), bat habitat assessments, breeding bird surveys, reptile studies and amphibian surveys.

Charlotte conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

Heather Wright, B.E.S.

Heather is a Terrestrial and Wetland Biologist with over one year of environmental experience in both the private and public sectors. She has experience in conducting vegetation inventories and reptile and mammal surveys. Heather graduated with a Bachelor of Environmental Studies from the University of Waterloo and completed a post-graduate certificate program in Ecosystem Restoration from Niagara College.

Heather conducted site specific habitat assessments for the Bluewater Wind Energy Centre, quantitatively assessing the number of wildlife trees per hectare within woodlands.

Ian Riemenschneider, B.Sc.

Ian is a Field Biologist with three years of experience in environmental consulting and research. He completed the Fish and Wildlife Technology program from Sir Sandford Fleming College, before completing a Bachelor of Science degree in Biology. He specializes in assessing fish populations and aquatic ecosystems, but has experience in identifying and conducting mammal surveys as well.

Ian conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

Jessica Pang, B.Sc. Candidate 2012

Jessica Pang is an undergraduate student at the University of Waterloo completing her degree in Biology, with a specialization in animal physiology. During her co-operative education term with NRSI, she worked as a Field

Technician, participating in a wide variety of field work from habitat assessment to wildlife surveys.

Jessica conducted site specific habitat assessments for the Bluewater Wind Energy Centre, quantitatively assessing the number of wildlife trees per hectare within woodlands.

Julia Lawler, B.E.S. Candidate 2012

Julia Lawler is an undergraduate student at the University of Waterloo completing her degree in Environment and Resource Studies. During her co-operative education term with NRSI, she worked as a Field Technician, participating in a wide variety of field work from habitat assessment to wildlife surveys.

Julia conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

Kaitlin N. Powers, B.E.S.

Kaitlin is a Terrestrial and Wetland Biologist with over 2 years experience working as an environmental technician in both public and private sectors. As a graduate in Environment and Resources Studies from the University of Waterloo, Kaitlin specialized her studies in ecological restoration and is a member of the Society for Ecological Restoration of Ontario (SERO). She is certified in Ecological Land Classification (ELC) for Northeastern Ontario (2011) and has been involved in completing ELC surveys, wildlife habitat assessments, bat monitoring, migratory bird and reptile surveys, as well as assisting in wetland evaluations.

Kaitlin conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

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Katherine Clapham, F.W.T.

Katherine is a Field Biologist with over one year of experience as a technician in the environmental field. She has experience in monitoring wildlife and the success of restoration projects, and the development of fish culture in hatcheries.

Katherine conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.

Ken Burrell, B.E.S.

Kenneth is a terrestrial and wetland biologist who has 6 years of experience working on a variety of environmental projects. He specializes in bird ecology but has over 4 years of experience conducting floral inventories and wildlife studies focused on amphibians, reptiles, bats, and mammals. Kenneth has worked on multiple stages for a variety of renewable energy projects, primarily focusing on wind power. Kenneth has completed his Bachelor of Environment and Resource Studies and is a candidate for a Masters of Environment and Resource Studies (2013) at the University of Waterloo. His Masters research will involve studying spring bird migration at Pelee Island, Ontario.

Ken conducted site specific habitat assessments for the Bluewater Wind Energy Centre, quantitatively assessing the number of wildlife trees per hectare within woodlands.

Nathan Miller, M.Sc.

Nathan graduated from the University of Guelph with a B.Sc. in Wildlife Biology and a M.Sc. in Integrative Biology. Research for Nathan's M.Sc. focused on the migration and conservation of the monarch butterfly throughout Canada and the United States. Nathan also has extensive experience conducting research on a wide range of wildlife species including birds, mammals, herpetofauna, insects and plants acquired while working as a naturalist for the Ministry of Natural Resources in Algonquin Park and an environmental consultant. Nathan is also certified in Northeastern Ecological Land Classification (ELC).

Nathan conducted site specific habitat assessments for the Bluewater Wind Energy Centre, quantitatively assessing the number of wildlife trees per hectare within woodlands.

Tara Lessard, B.Sc.

Tara is a Terrestrial and Wetland Biologist with more than 4 years of experience working in the environmental field. During her consulting experience, Tara has conducted bird and bat assessments, amphibian studies, and other fauna assessments throughout Ontario. Tara has participated in field investigations and reporting for wind power projects in Ontario and New Brunswick.

Tara conducted site specific habitat assessments for the Bluewater Wind Energy Centre, assessing qualitative characteristics of potential wildlife trees.
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4.1.2 Survey Dates

In accordance with the REA Regulation, NRSI recorded dates, times, duration, and weather conditions during each site investigation. This information has been summarized in the following table. Detailed descriptions of staff roles and qualifications can be found in Section 4.1.1 of this report, and detailed field forms have been appended to this report.

Table 3. Site Investigation Survey Dates

Purpose	General Methods	Feature ID	Date(s)	Time(s) and Duration	Weather	Staff
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	518 463 548	June 2, 2010	11:15 – 19:55 8 hrs 40 minutes	18˚C, 100%CC, Light rain, Wind 3 from W.	AGR, ACN
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	477 448 514	June 3, 2010	14:06 – 16:20 2hrs 14 minutes	21˚C, 100%CC, No precipitation, Wind 1.	AGR, ACN
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	542	June 4, 2010	13:09 – 15:00 1 hr 51 minutes	23˚C, 100%CC, No precipitation, Wind 2 from S.	ACN
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	437 524	June 9, 2011	12:00 – 18:30 8 hrs 30 minutes	15ºC, Wind 3 from NW	CLH, JHL
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	541 542	June 15, 2011		24C, No precipitation, Wind 3 from S. CC 55%	JHL, JB
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	483	June 16, 2011		20C, 100%CC, light precipitation	JHL, JB
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	504	June 19, 2011	16:00 -	27C, 50%CC, no precipitation, wind 2	KTC, AMD
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	532	June 21, 2011	14:02 – 15:00	24C, 70%CC, no precipitation, Wind 2	TAL, AMD
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	518 534	June 23, 2011	13:58 -	20C, 100%CC, no precipitation, Wind 1 from SW	TAL, KNP
Bat Habitat Characterization	Qualitative assessment of wildlife trees, Area search for caves or crevices	480 510 532	June 24, 2011	13:39 - 16:30	18C, 100%CC, Periodic rain, Wind 2 from West	TAL, KNP
Bat Habitat Assessment	Quantitative assessment of wildlife trees	508	Nov. 23, 2011	12:20 – 13:30 50 minutes	1C, Sunny, No precipitation, 15%CC, Wind 1	JSP, BWW

Bat Habitat Assessment	Quantitative assessment of wildlife trees	470 484 498 460	Nov. 24, 2011	08:15 – 17:00 8 hrs 45 minutes	6C, 100%CC, No precipitation, Wind 0.	JSP, BWW
Bat Habitat Assessment	Quantitative assessment of wildlife trees	544 427 492 481	Dec.9, 2011	09:02 – 09:56 09:58 – 10:42 12:14 – 12:32 13:08 – 13:40 2 hrs 28 minutes	-2C, 100%CC, Snow, Wind 4.	NGM, KGB

4.1.3 Identification of Bat Habitat

The Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000) and the Significant Wildlife Habitat Ecoregion Criteria Schedules Addendums (OMNR 2009, OMNR 2011a) outline general characteristics that may be used to identify candidate significant bat habitats, including seasonal concentration areas. The general characteristics used to identify candidate seasonal concentration areas relating to bat habitats are outlined in Table 4 below.

Table 4. General Characteristics Used to Identify Candidate Significant Bat Habitats Within the Bluewater Wind Energy Centre

Bat Habitat	Appendix Q Suggested Criteria	Significant Wildlife Habitat Technical Guide and Addendum Habitat Criteria
Bat Hibernacula	• Relative importance of the site • Presence of species of conservation concern • Species diversity • Abundance • Habitat quality • Location of site • Level of disturbance	Caves, mine shafts, underground foundations, Karsts or one of the following Community Types: Crevice (CCR), Cave (CCA). Does not include buildings (OMNR 2010b, 2011a).
Bat Maternity Colonies (2009)	N/A	Tree cavities, vegetation, buildings (OMNR 2009, 2010b).
Bat Maternity Colonies (2011)	N/A	Any of the following Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) that have >10/ha wildlife trees (snags or cavity trees) which are >25cm dbh. Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario (OMNR 2011a).
Bat Migratory Stopover Area	N/A	Location and characteristics of stopover habitats are generally unknown (OMNR 2011a).

Site investigations conducted in June of 2010 and 2011 were conducted according to the general guidance that was available at the time, from the Ecoregion Criteria Schedules Addendum (OMNR 2009) and from the document *Bats and Bat Habitats: Guidelines for Wind Power Projects* (OMNR 2010a). As a result of the lack of information on identifying suitable habitats for bat maternity colonies available at the time, NRSI used the information available from OMNR documents, combined with secondary research

conducted and the experience of the company to identify candidate bat maternity colonies in woodlands. Criteria used to identify candidate bat maternity colonies included the presence of snags or live cavity trees which were >20cm dbh. Snags which were considered suitable habitat had exfoliating bark or cavities. In addition, any suitable candidates had a clear entranceway to the cavity or surrounding exfoliating bark. Field notes for these assessments are included in Appendix I.

New information obtained through discussion with MNR in late June 2011, in combination with the revised MNR guidance document released in July 2011 identified that suitable maternity colony habitat would include at least 10 quality wildlife trees/ha. As a result, a rough estimation of the quantity of candidate trees was introduced into subsequent site investigations conducted in June 2011 (for natural features 480, 510, and 534).

Site investigations conducted after June of 2011 followed the most recent OMNR guidance document, *Bats and Bat Habitats: Guidelines for Wind Power Projects* (2011b), which indicates that the number of wildlife trees per hectare can be determined using 0.05ha plots (circular plots with a radius of 12.6m), which are randomly placed throughout each woodland being investigated. The document stipulates that a minimum of 10 plots should be used for woodlands which are 10ha or less in size, with one additional plot for every additional hectare for larger woodlands (up to a maximum of 35 plots). NRSI followed this protocol after June 2011, randomly selecting circular plots 12.6m in radius within the portions of woodlands for which access was granted. The number of snags or cavity trees within these plots which were >25cm dbh were counted. Field notes for these assessments are included in Appendix I.

4.1.4 Identification of Generalized Candidate Significant Bat Habitats

As operational impacts have been determined not to occur to bat habitats located further than 120m from a proposed wind turbine (OMNR 2011c), woodlands located within 120m of other project components may be treated as significant, with generalized candidate significant wildlife habitat mitigation measures applied in the EIS to address potential impacts to these habitats during construction only. However, not all woodlands have the potential to contain a sufficient quantity of suitable snags or wildlife trees to indicate they may contain a significant bat maternity colony. As a result, not all

woodlands located further than 120m from wind turbines, but less than 120m from other project components, will be considered as generalized candidate significant wildlife habitat. NRSI has utilized the Ecological Land Classification information collected by AECOM in order to narrow down the list of woodlands considered as generalized candidate significant wildlife habitat for bat maternity colonies.

A woodland is identified as generalized candidate significant wildlife habitat if it consists of suitable deciduous or mixed mid-age to mature forests with the canopy stand description (top 4 species) containing the following species: white pine (*Pinus strobus*), maple (*Acer* spp.), aspen (*Populus tremuloides*), ash (*Fraxinus* sp.), oak (*Quercus* sp.). These species are identified as tree species providing good cavity habitat in the 2011 *Bats and Bat Habitats: Guidelines for Wind Power Projects* document (OMNR 2011b). In addition these woodlands must contain a sufficient quantity of trees and snags >25cm DBH to allow for the potential for >10 suitable trees per hectare to occur (at least occasionally occurring live trees >25cm DBH and rarely occurring snags >25cm DBH). This information is obtained from the tree and snag size class analysis which utilizes a scale of none, rare, occasional, or abundant for size categories <10cm, 10-24cm, 25-50cm, and >50cm DBH. If cavity trees were specifically noted by AECOM biologists, and there are at least occasionally occurring live trees >25cm DBH, although snags were not noted, this habitat is considered as generalized candidate significant wildlife habitat as well.

If a natural area meets any of the following criteria, it is not considered as generalized candidate significant wildlife habitat: plantation; has a canopy dominated by coniferous trees; has <60% canopy cover; contains a significant component of weedy tree species such as common buckthorn (*Rhamnus cathartica*) or common apple (*Malus pumila*); or contains no trees >25cm DBH.

4.2 Site Investigation Results

The majority of the Bluewater Wind Energy Centre is dominated by agricultural habitats, including both actively tilled cropland and pasture. Fallow fields, hedgerows, and some woodlands are also present throughout the project area. NRSI used habitat criteria outlined by the Significant Wildlife Habitat Technical Guide (OMNR 2000), Ecoregion Criteria (OMNR 2009, 2011a), and Bats and Bat Habitat Guidelines (OMNR 2010b,

2011b) to compare site-specific habitat conditions to potential bat habitats. The results of the site investigation are provided in the sections below.

4.2.1 Bat Winter Hibernacula

According to the 2011 Addendum to the SWHTG, caves, mine shafts, underground formations and Karsts are considered examples of locations where bat hibernacula may be found (OMNR 2011a). No candidate bat hibernacula were identified by NRSI or AECOM biologists within the Bluewater Wind Energy Centre.

4.2.2 Bat Maternity Colony

NRSI conducted assessments to determine the potential for candidate significant bat maternity colonies using a qualitative assessment method for habitats examined prior to the release of quantitative criteria, as well as a plot-based approach to calculate the number of snags or cavity trees per hectare within each woodland examined after the release of the 2011 *Bat and Bat Habitats* guidelines (OMNR 2011b). The results of these exercises are included in Table 5 below. This table is followed by another which indicates the size, composition, attributes, and functions of those habitats which are considered Candidate Significant Bat Maternity Colonies (Table 6).

Table 5. Summary of Site Investigation Results and Consideration for Candidate Significant Bat Habitats

Feature ID	<120m from Turbine No.	Size (ha)	Qualitative Assessment	Quantitative Assessment		Evaluation of Significance Required (Y/N)
			Qualitative Characteristics of Habitat	Number of Sample Plots	# Wildlife Trees per ha	
504	1, 2	92.53	AECOM's ELC information indicates this is a suitable mid-age sugar maple deciduous forest with abundant trees 25-50cm DBH. There is a candidate tree which is a large sugar maple located approximately 20m in from the edge of the woodland. It is approximately 100 cm dbh and contains a large cavity. The overhead vegetation cover is 80% in this location.			**Yes**
427	6	0.73		2	10.00	**Yes**
544	7	3.79		9	15.56	**Yes**
541	7	29.65	AECOM's ELC information indicates this contains suitable mid-age to mature deciduous upland and lowland forests, with some swamp. This forest contains a willow snag in a very open clearing, which is largely hollow. It also has exfoliating bark and woodpecker holes. The snag is located 7m north of a creek running through the woodland.			**Yes**
532	8, 9	8.68	AECOM's ELC information indicates this is a younger sugar maple deciduous forest, containing occasional trees 25-50cm DBH and rare trees >50cm DBH, with some rare snags 25-50cm DBH. This woodland has an area containing some young, small snags, largely of ash (*Fraxinus* sp.) and white elm (*Ulmus americana*), however none contain cavities and there is little exfoliating bark. There is an area in the southeast section of the woodland containing several candidate maple (*Acer* sp.) and American beech snags which are 4-15m in height, and 20-40cm dbh. There are a few weaker candidate snags within 30m of this group as well.			**Yes**
518	10, 11	76.82	AECOM's ELC information indicates that this woodland does not contain trees >25cm DBH. In addition, only one area recorded rarely occurring snags >50cm DBH. As a result, this woodland is			**No**

			unlikely to contain a sufficient number of suitable wildlife trees to qualify as candidate significant habitat for bat maternity colonies. NRSI identified one weak candidate tree, which was a small white birch snag. As this is also not a preferred roost tree, this habitat is not considered candidate significant habitat for bat maternity colonies.			
508	11	7.45		10	8.00	**No**
498	12	2.66		10	8.00	**No**
481	14	4.24		10	8.00	**No**
480	15, 16	30.29	This woodland is a deciduous forest containing many young trees, however there are some mid-size and large trees up to 80cm dbh throughout. There are some snags on the property which was assessed (~8) which are >20cm dbh, >5m in height, and contained cavities. However, at the time of assessment in June 2011 the quantity was estimated to be insufficient to compare to new information obtained part-way through the field season regarding the quantity of snags required per ha.			**No**
463	17, 18	32.01	AECOM's ELC indicates this is a mid-age dry-fresh sugar maple-white ash deciduous forest, with abundant trees 25-50cm DBH, and occasional trees >50cm DBH. It also lists rare snags 25-50cm DBH. NRSI identified a suitable candidate tree found on the edge of the woodland, which is a dead elm snag. This edge of the woodland is found adjacent to a wet meadow riparian corridor. The overhead vegetation cover above the candidate tree is 20%.			**Yes**
542	19, 20	15.22	This is a lowland deciduous maple-beech dominated forest, determined to have relatively weak candidate trees because there are many young trees, and the large trees which exist are very healthy. Some snags are present, but most are very small or without holes, cracks or exfoliating bark. Canopy cover is dense. There is one candidate tree, which is a large dying black cherry.			**Yes**
524	21, 22	3.05	AECOM's ELC information indicates this is a dry-			**Yes**

			fresh sugar maple deciduous forest with abundant trees 25-50cm DBH and rarely occurring trees >50cm DBH. No snags were noted. NRSI identified a suitable candidate tree which is a large, living basswood 10m into the woodlot. It contains a large cavity ~ 3m long, which begins at ground level. The DBH of this tree is ~70cm.			
510	Alt1, 23	41.52	This woodland is a young to middle-age deciduous forest, containing a variety of maple species. Several snags were noticed, however, at the time of assessment in June 2011 the quantity was estimated to be insufficient to compare to new information obtained part-way through the field season regarding the quantity of snags required per ha.			**No**
492	24	1.42		3	40.00	**Yes**
483	Alt2	6.88	AECOM's ELC information indicates this feature contains deciduous swamp and fresh-moist sugar maple –hardwood deciduous forest. Abundant trees 25-50cmDBH were recorded in both areas, with at least rarely occurring trees >50cm DBH as well. Abundant snags and cavities were also noted. NRSI identified a suitable candidate tree, which is a live silver maple, ~1m dbh. One large branch has snapped off, and the tree has a crack and hollow. The hollow is 3m above the ground, 15-20cm wide at its widest, with an opening 1m in length.			**Yes**
470	25	1.50		10	12.00	**Yes**
460	30	18.98		27	5.93	**No**
437	Alt3	5.31	AECOM's ELC indicates this is a swamp maple deciduous swamp, also containing green ash. It was noted that there were occasional trees 25-50cm DBH. NRSI identified two suitable candidate trees within 15m of each other, including two large silver maples (*Acer saccharinum*) with dead branches, exfoliating bark, woodpecker holes, and enclosed cavities. The overhead vegetation cover is 40%.			**Yes**
534	32,33	51.79	AECOM's ELC information indicates this is a mid-age to mature sugar maple deciduous forest as well			**Yes**

			as mature red maple swamp. The feature contains occasional to abundant trees 25-50cm DBH and rare to occasional trees >50cm DBH. Rarely occurring snags 25-50cm DBH were also noted. NRSI identified that this woodland contains several weaker candidates and one good candidate. Two weak candidate snags are found adjacent to each other. One is 10m tall, and the other 20m tall. Both are 20-30cm dbh and contain many woodpecker holes up to 5cm wide and exfoliating bark. Two additional weak candidate snags abut one another. One is 20m in height, and the other 1.5m in height. The taller has no cavities, but contains some exfoliating bark. The shorter has a large cavity at the top of it. Both are 25-30cm dbh. A single good candidate tree is a large (~70cm dbh) beech snag, which is ~30m tall with a large cavity 3m from the ground and some exfoliating bark.			
484	37	50.19		24	5.83	**No**

Table 6. Summary of Candidate Significant Bat Maternity Colonies within 120m of Wind Turbines in the Bluewater Wind Energy Centre

Wildlife Habitat ID	Feature ID	Size (ha)	Composition	Attributes	Functions	Distance to Wind Turbine (blade tip)	Figure	EOS Required (Y/N)
BMA-001	504	92.53	*Acer saccharum* (sugar maple) – *Fagus grandifolium* (American beech) forest.	Contains a large sugar maple located approximately 20m in from the edge of the woodland. It is approximately 100 cm DBH and contains a large cavity. The overhead vegetation cover is 80% in this location.	Habitat for bat maternity colonies	84m (Turbine 1)	**2**	**Yes**
BMA-002	427	0.73	Dominant *Fraxinus* sp. (ash species). Abundant *Acer saccharum* (sugar maple).	10.00 wildlife trees per hectare	Habitat for bat maternity colonies	43m (Turbine 6)	**2**	**Yes**
BMA-003	544	3.79	Dominant *Fraxinus americana* (white ash). Occasional *Ostrya virginiana* (ironwood), *Acer saccharum* (sugar maple), *Tilia americana* (basswood), and *Fagus grandifolia* (American beech).	15.56 wildlife trees per hectare	Habitat for bat maternity colonies	73m (Turbine 7)	**2**	**Yes**
BMA-004	541	29.65		Contains a willow snag in a very open clearing, which is largely hollow. It also has exfoliating bark and woodpecker holes. The snag is located 7m north of a creek running through the woodland.	Habitat for bat maternity colonies	43m (Turbine 7)	**2**	**Yes**
BMA-005	532	8.68		Contains an area with several maple (*Acer*	Habitat for	53m	**2**	**Yes**

				sp.) and American beech snags which are 4-15m in height, and 20-40cm dbh. There are a few weaker candidate snags within 30m of this group as well.	bat maternity colonies	(Turbine 9)		
BMA-007	463	32.01	This woodland contains basswood (*Tilia americana*) and hickory (*Carya* sp.).	Contains a candidate tree is found on the edge of the woodland, which is a dead elm snag. This edge of the woodland is found adjacent to a wet meadow riparian corridor. The overhead vegetation cover above the candidate tree is 20%.	Habitat for bat maternity colonies	80m (Turbine 16)	**2**	**Yes**
BMA-008	542	15.22	This is a lowland deciduous maple-beech dominated forest, determined to have relatively weak candidate trees because there are many young trees, and the large trees which exist are very healthy. Some snags are present, but most are very small or without holes, cracks or exfoliating bark. Canopy cover is dense.	Contains one candidate tree, which is a large dying black cherry.	Habitat for bat maternity colonies	40m (Turbine 19)	**2**	**Yes**
BMA-009	524	3.05	*Acer saccharum* (sugar maple)-mixed hardwood deciduous forest.	Contains a candidate tree which is a large, living basswood 10m into the woodlot. It contains a large cavity ~ 3m long, which begins at ground level. The DBH of this tree is ~70cm.	Habitat for bat maternity colonies	110m (Turbine 22)	**2**	**Yes**

BMA-010	492	1.42	Abundant *Acer saccharum* (sugar maple). Occasional *Fraxinus americana* (white ash) and *Acer rubrum* (red maple). Rare *Prunus serotina* (black cherry) and *Ostrya virginiana* (ironwood).	40.00 wildlife trees per hectare	Habitat for bat maternity colonies	118m (Turbine 24)	**2**	**Yes**
BMA-011	483	6.88		Contains a live silver maple, ~1m dbh. One large branch has snapped off, and the tree has a crack and hollow. The hollow is 3m above the ground, 15-20cm wide at its widest, with an opening 1m in length.	Habitat for bat maternity colonies	94m (Turbine Alt2)	**2**	**Yes**
BMA-012	470	1.50	Dominant *Fraxinus americana* (white ash). Abundant *Ulmus americana* (white elm) and *Acer saccharum* (sugar maple).	12.00 wildlife trees per hectare	Habitat for bat maternity colonies	89m (Turbine 25)	**2**	**Yes**
BMA-013	437	5.31	Ash (*Fraxinus* sp.) swamp.	Contains two candidate trees within 15m of each other, including two large silver maples (*Acer saccharinum*) with dead branches, exfoliating bark, woodpecker holes, and enclosed cavities. The overhead vegetation cover is 40%.	Habitat for bat maternity colonies	91m (Turbine Alt3)	**2**	**Yes**
BMA-014	534	51.79		Contains a candidate tree which is a large (~70cm dbh) beech snag. It is ~30m tall with a large cavity 3m from the ground and some exfoliating bark.	Habitat for bat maternity colonies	39m (Turbine 33)	**2**	**Yes**

Figure 2

Bluewater Wind Energy Centre: Bat Habitats

Candidate Significant Bat Habitat

Natural Resource Solutions Inc.
Aquatic & Terrestrial Wildlife Biologists

March 23, 2012
Project: NRSI-1075
Scale: 1:50 000 (11 x 17")
UTM Zone 17 NAD83

BMA-003 544
BMA-004 541
BMA-005 532
BMA-006 518
BMA-001 504
BMA-008 542
BMA-009 524
BMA-014 534
BMA-010 492
BMA-015 514
BMA-011 483
BMA-012 470
BMA-007 463
BMA-013 437
BMA-002 427
508
498
481
480
460
484
510

CRYSTAL SPRINGS RD
WILDWOOD RD
JERRY LANE
BAULCH BLVD
ELMSLIE DR
BLUE BLUFF RD
LINDY AVE
WEBB RD
RAVINE ST
PAVILLION RD
EGERTON BEACH RD
WESTDELL DR
WOODLAND DR
DRIFTWOOD DR
HOMESTEAD HEIGHTS DR
HOMESTEAD RD
BLUEHAVEN RD
ROY ST
BLUEWATER HWY
DURAND-HURONVIEW RD
CREST BEACH RD
CREST RD
SHANGRILA RD
BRONSON LINE
MILL RD
VIENNA ST
GOSHEN LINE
BABYLON LINE
CENTENNIAL RD
BLACKBUSH LINE
STAFFA RD
DANCELAND RD
BLIND LINE
PARR LINE
FANSVILLE LINE
CONC 5 RD
KIPPEN RD
BELFAST LINE
GULLEY LINE
BANNOCKBURN LINE
SMIRNOFF LINE
PORT LINE
ST N

Note: The final boundaries of natural features, including bat habitats, are identified within the full Natural Heritage Assessment conducted by AECOM. This map is for general reference only.

0 1 2 3 Kilometers

Legend
- Study Area Boundary
- 120m Buffer
- Project Location
- Laydown Area
- Substation
- Proposed Turbine
- Transmission Line
- Access Road
- Highway
- Primary Road
- Local Street
- Watercourse
- Waterbody
- Wetland
- Candidate Significant Bat Maternity Colony
- Woodland (<120m From Turbine)
- Woodland (>120m From Turbine)

442000 444000 446000 448000 450000 452000 454000 456000 458000 460000
4820000 4818000 4816000 4814000 4812000 4810000

Path: X:\1075_Bluewater\NRSI_1075B_Fig2_CandidateSigBatHabitat_50K_2012_03_23_SWM.mxd

Table 7. Assessment of Generalized Candidate Significant Wildlife Habitat

Feature ID	Criteria Rationale	Distance from Suitable Habitat to Nearest Project Component (m)	Generalized Candidate Significant Wildlife Habitat (Y/N)	EOS Required (Y/N)
426	This woodland was identified as a mid-aged, deciduous forest dominated by silver maple, ash and black walnut. Size class analysis unknown, however one cavity was noted.	0 (road and collection line)	Yes	Yes (Treat As Significant)
439	Mid-age deciduous forest containing ash and aspen in the canopy, with abundant trees 25-50cm DBH, but rarely occurring snags only at <25cm DBH. Abundance of appropriately sized trees which the potential to contain cavities suggests the habitat may be suitable for bat maternity colonies.	66 (road)	Yes	Yes (Treat As Significant)
442	Contains mineral cultural woodland (<60% canopy cover) which does not qualify. Also contains meadow and swamp thicket communities which do not qualify.	No Suitable Habitat	No	No
450	Contains coniferous plantation which does not qualify. Remainder is suitable dry-fresh sugar maple forest, mid-aged to mature. However, no trees or snags >25cm DBH were noted.	No Suitable Habitat	No	No
456	Contains suitable mature white ash-beech and sugar maple-dominated deciduous forest and green ash swamp. Suitably sized trees are snags are found throughout, with abundant trees 25-50cm DBH occurring particularly in the sugar-maple dominated component.	0 (road)	Yes	Yes (Treat As Significant)
459	Mid-aged green ash dominated lowland deciduous forest, however no trees or snags >25cm DBH were noted.	No Suitable Habitat	No	No
462	Contains suitable mid-aged fresh-moist green ash dominated lowland deciduous forest. Although one cavity was noted, there were no snags or trees >25cm DBH.	No Suitable Habitat	No	No
475	Suitable mid-aged dry-fresh sugar maple dominated deciduous forest. Abundant trees >25cm DBH and occasional >50cm DBH, as well as occasional snags >25cm DBH and rare snags >50cm DBH.	65 (collection line)	Yes	Yes (Treat As Significant)

487	Contains coniferous plantation, which does not qualify. However it also contains suitable mature dry-fresh sugar maple forest, with abundant trees >25cm DBH and occasional >50cm, occasional snags >25cm DBH and rare >50cm.	15 (road and collection line)	Yes	Yes (Treat As Significant)
488	Contains mid-aged green ash deciduous swamp, and maple mineral deciduous swamp which could contain suitable habitat. Note the thicket portion, which is found within 120m of a proposed turbine, does not qualify for candidate bat maternity colony habitat.	18 (transmission line)	Yes	Yes (Treat As Significant)
490	Consists of coniferous plantation.	No Suitable Habitat	No	No
494	Contains fresh-moist willow lowland deciduous forest, containing some Freeman's maple (*Acer* x *freemanii*).	16 (transmission line)	Yes	Yes (Treat As Significant)
495	Contains some deciduous plantation. Note that swamp thicket also does not qualify.	No Suitable Habitat	No	No
496	Contains some deciduous plantation. Note that meadow marsh also does not qualify.	No Suitable Habitat	No	No
501	Consists of white pine coniferous plantation and black walnut deciduous plantation.	No Suitable Habitat	No	No
506	This feature contains mid-aged dry-fresh sugar maple deciduous forest, however this habitat is located >120m from the project location. Other habitats within this feature are not suitable candidates for bat maternity colonies.	No Suitable Habitat	No	No
512	Within 120m of the project location, contains fresh-moist lowland deciduous forest ecosite containing some Manitoba maple (*Acer negundo*). Mature trees (height category 1) noted. Some mixed swamp is also located within 120m of the project location, however this area in particular (within 120m) is represented by coniferous trees and as a result does not qualify.	5 (transmission line)	Yes	Yes (Treat As Significant)
514	Potentially suitable habitat is found within 120m of the project location in maple mineral deciduous swamp and sugar maple deciduous forest. Abundant trees 25-50cm DBH were noted, as well as occasional trees >50cm DBH.	3 (transmission line)	Yes	Yes (Treat As Significant)
520	Mature deciduous forest containing sugar maple and trembling aspen.	81 (transmission	Yes	Yes (Treat As

	Additional information was not able to be obtained due to the distance of the woodland from the roadside.	line)		Significant)
525	Mid-aged dry-fresh sugar maple deciduous forest, however no trees or snags >25cm DBH were recorded.	No Suitable Habitat	No	No
537	Mature dry-fresh sugar maple-beech, sugar maple-basswood deciduous forest, and swamp maple deciduous swamp. Contains abundant trees 25-50cm DBH and occasional trees >50cm DBH, as well as occasional snags both 25-50cm DBH and >50cm DBH.	0 (collection line)	Yes	Yes (Treat As Significant)
539	Contains mid-aged fresh-moist black walnut lowland deciduous forest, with some ash. There was no access to this property to confirm size class analysis.	22 (road)	Yes	Yes (Treat As Significant)
545	Mature dry-fresh sugar maple-beech deciduous forest. There was no access to this property to confirm size class analysis.	17 (road)	Yes	Yes (Treat As Significant)
551	Contains young to mid-aged white pine-black walnut mixed forest. It contains abundant trees >25cm DBH and rare trees >50cm DBH which could contain appropriate cavities.	19 (transmission line)	Yes	Yes (Treat As Significant)
552	Consists of cultural woodland containing some white ash trees, however there are only occasional trees 25-50cm DBH and no snags noted. FOD is also found within 120m of the transmission line and due to a lack of site access and the inability to see this from the property line, this polygon may contain candidate bat maternity colony habitat.	105 (transmission line)	Yes	Yes (Treat As Significant)
553	Consists of Scots pine (*Pinus sylvestris*) coniferous plantation.	No Suitable Habitat	No	No
555	Fresh-moist oak-maple-hickory deciduous forest, containing abundant trees 25-50cm DBH and rare trees >50cm DBH.	24 (transmission line)	Yes	Yes (Treat As Significant)
556	Dry-fresh sugar maple deciduous forest, containing abundant trees 25-50cm DBH and rare trees >50cm DBH	0 (transmission line)	Yes	Yes (Treat As Significant)
561	Swamp maple mineral deciduous swamp and lowland deciduous forest. There was no access to this property to confirm size class analysis.	9 (transmission line)	Yes	Yes (Treat As Significant)
562	Contains fresh -moist lowland deciduous forest and swamp. None of	No Suitable Habitat	No	No

	the species listed in the stand description are preferred maternity roost trees.			
563	Consists of white spruce coniferous plantation.	No Suitable Habitat	No	No

4.3 Site Investigation Summary

NRSI did not identify any candidate bat hibernacula in the vicinity of the Bluewater Wind Energy Centre. However, 15 candidate significant bat maternity roost habitats were identified in woodlands found within 120m of wind turbines. These are summarized in Table 8 below. An additional 18 woodlands were identified as generalized candidate significant wildlife habitat for bat maternity roosts, as woodlands <120m from the project location (but >120m from a turbine) with the potential to contain a sufficient quantity of suitable roost trees.

Table 8. Summary of Candidate Bat Habitats within 120m of the Bluewater Wind Energy Centre

Wildlife Habitat ID	Feature ID	Distance to Closest Turbine (from blade tip)	Evaluation of Significance Required (Y/N)
BMA-001	504	84 m (T1)	Yes
BMA-002	427	43 m (T6)	Yes
BMA-003	544	73 m (T7)	Yes
BMA-004	541	43 m (T7)	Yes
BMA-005	532	53 m (T9)	Yes
BMA-007	463	80 m (T16)	Yes
BMA-008	542	40 m (T19)	Yes
BMA-009	524	110 m (T22)	Yes
BMA-010	492	118 m (T24)	Yes
BMA-011	483	94 m (TAlt2)	Yes
BMA-012	470	89 m (T25)	Yes
BMA-013	437	91 m (TAlt3)	Yes
BMA-014	534	39 m (T33)	Yes

5.0 Evaluation of Significance

In accordance with the REA Regulation, NRSI biologists conducted field surveys to evaluate the significance of the 15 candidate bat maternity colonies identified as part of the site investigation. The evaluation of significance followed bat monitoring protocol that was current at the time of the field investigations, *Bats and Bat Habitats: Guidelines for Wind Power Projects* (OMNR 2010b).

5.1 Evaluation of Significance Methods

5.1.1 Staff Roles

The requirements of the REA process indicate that the name and qualifications of all staff participating in the evaluation of significance should be included. As a result, the qualifications and roles of all staff participating in the evaluations of significance at the Bluewater Wind Energy Centre have been outlined in the following sections. Qualifications of staff who also assisted in the site investigation are listed in Section 4.1.

Andrew G. Ryckman, B.Sc.

Andrew's role in the project was to act as the project manager, overseeing all aspects of the evaluation of significance, including all associated field work and reporting. Andrew reviewed photos and habitat descriptions of potentially significant habitats, provided quality assurance screening for species identification of recorded calls, and provided input into determinations of significance.

Christy Humphrey, B.E.S.

Christy organized field work to be conducted for the evaluation of significance, and conducted evening visual surveys and set up and maintained equipment for through-the-night surveys. Christy also interpreted the results of surveys to determine significance, and reported the results for the evaluation of significance.

Alyson Smith, B.A.

Alyson Smith was an undergraduate student in Geography at Wilfred Laurier University when she completed her co-operative education term with NRSI in the summer of 2010. She has since completed her degree in Arts (2011). During her time with NRSI, she worked as a Field Technician, participating in a wide variety of field work from habitat assessment to wildlife surveys.

Alyson conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Andrew Dean, B.E.S.

Andrew conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Ashley Nathan, M.S.

Ashley conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Brett Kibbler

Brett worked as a Field Technician for NRSI and is familiar with acoustic bat monitoring equipment.

Brett assisted with evening visual surveys, and set up and maintained equipment for through-the-night surveys.

Brian Watson, F.W.T.

Brian conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Brydon MacVeigh, F.W.T.

Brydon is a Field Biologist with over 3 years of work experience in the environmental field. His areas of expertise are aquatic Species At Risk and fish community assessments, but he also has experience with terrestrial related functions. Brydon has experience conducting Ecological Land Classification, turtle surveys, and salamander and anuran trapping surveys.

Gina conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Carolyn Knapper, F.W.T.
Carolyn conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Charlotte Moore, B.E.S.

Charlotte conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Gina MacVeigh, F.W.T.

Gina is a Field Biologist with over 5 years of work experience in the environmental field. Her areas of expertise are fish habitat surveys, aquatic habitat mapping, and fish community assessments, but she also has experience with terrestrial surveys. Gina has conducted bat mortality surveys around operational turbines, winter moose habitat surveys, deer habitat and movement surveys, vegetation inventories, salamander and anuran trapping surveys, and habitat assessments and tagging of turtle Species at Risk.

Gina conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

W. Graham Wright, B.E.S.

Graham is a Terrestrial and Wetland Biologist and a recent graduate of the University of Waterloo with a Bachelor of Environmental Studies. He has a combined year of experience working both as a field technician and as an Information Officer working with protected areas and Species At Risk in Ontario. He has also participated in various terrestrial and aquatic environmental monitoring projects.

Graham analyzed both abundance and species data obtained through evaluation of significance surveys.

Julia Lawler, B.E.S. Candidate 2012

Julia conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Kaitlin N. Powers, B.E.S.

Kaitlin conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Katherine Clapham, F.W.T.

Katherine conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Katherine St. James, M.Sc.

Katherine is a Terrestrial and Wetland Biologist with more than 3 years of experience working in the environmental field. She specializes in environmental sciences, ecology, and bio-geographical studies, and completed her master's research on potential barrier effects on salamander populations. During her master's research and consulting experience, Katherine has routinely conducted ecological assessments and collected field information on vegetation, birds, amphibians, and other wildlife species throughout Ontario.

Katherine analyzed both abundance and species data obtained through evaluation of significance surveys.

Megan Anevich, B.E.S. Candidate 2012

Megan Anevich is an undergraduate student at the University of Waterloo completing her degree in Environment and Resource Studies. During her co-operative education term with NRSI, she worked as a Field Technician, participating in a wide variety of field work from habitat assessment to wildlife surveys.

Megan conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Patrick Deacon, B.E.S.

Patrick is a Terrestrial Biologist with 4 years of environmental consulting experience. He regularly conducts vegetation inventories and community mapping, and specializes in ecological restoration with particular focus on Species At Risk, tallgrass prairie ecosystems, and invasive species management. He also has experience conducting a variety of wildlife studies, including birds and mammals.

Patrick conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

Tara Lessard, B.Sc.

Tara conducted evening visual surveys and set up and maintained equipment for through-the-night surveys.

5.1.2 Evaluation Dates

In accordance with the REA Regulation, NRSI recorded dates, times, duration, and weather conditions during each evaluation of significance. This information has been summarized in the following table, and detailed in Appendix II. Detailed descriptions of staff roles and qualifications can be found in Section 5.1.1 of this report, and detailed field forms have been appended to this report.

Table 9. Evaluation of Significance Survey Summary

Purpose	General Methods	Wildlife Habitat ID	Feature ID	Station	Date	Start & End Time	Duration	Staff
Quantitative assessment of bats at candidate maternity roosts	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-007	463	BAT-004	June 2, 2010	11:15 – 20:10	8hrs 55 minutes	AGR, ACN
	Evening Visual Survey	BMA-007	463	BAT-004		20:57 – 22:30	1hr 33 minutes	
	Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-007	463	BAT-004	June 3, 2010	21:15 – 22:50	1 hr 35 minutes	AGR, ACN
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-008	542	BAT-008	June 4, 2010	13:09 – 14:30	1 hr 21 minutes	ACN
	Evening Visual Survey	BMA-008	542	BAT-008	June 6, 2010	22:18 – 23:52	1hr 34 minutes	ACN, PWD
	Evening Visual Survey	BMA-007 BMA-008	463 542	BAT-004 BAT-008	June 7, 2010	21:14 – 00:26	3hrs 12 minutes	ACN, PWD
	Evening Visual Survey	BMA-007 BMA-008	463 542	BAT-004 BAT-008	June 8, 2010	21:20 – 00:02	2 hrs 42 minutes	PWD, MA, ACN
	Evening Visual Survey	BMA-008	542	BAT-008	June 9, 2010	21:06 – 21:16	10 minutes	ACN, BK
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-007 BMA-008	463 542	BAT-004 BAT-008	June 10, 2010	10:40 – 20:15	9 hrs 25 minutes	ACN, BK, MA
	Evening Visual Survey	BMA-007 BMA-008	463 542	BAT-004 BAT-008		20:45 – 00:05	3 hrs 20 minutes	ACN, BK
	Evening Visual	BMA-007	463	BAT-004	June 13,	21:51 – 00:08	2 hrs 17	ACN, BK

	Survey	BMA-008	542	BAT-008	2010		minutes	
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-008	542	BAT-008	June 14, 2010	14:00 – 14:30	30 minutes	BK
	Evening Visual Survey	BMA-007 BMA-008	463 542	BAT-004 BAT-008		21:14 – 00:16	3 hrs 2 minutes	ACN, BK
	Evening Visual Survey	BMA-007 BMA-008	463 542	BAT-004 BAT-008	June 15, 2010	20:53 – 23:58	3 hrs 5 minutes	ACN, BK
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-007	463	BAT-004	June 16, 2010	13:07 – 13:37	30 minutes	ACN, BK
	Evening Visual Survey	BMA-007 BMA-008	463 542	BAT-004 BAT-008		21:01 – 00:03	3 hrs 2 minutes	
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-008	542	BAT-008	June 18, 2010	12:15 – 14:15	4 hrs	PWD, BK
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-007 BMA-008	463 542	BAT-004 BAT-008	June 21, 2010	11:05 – 14:15	3 hrs 10 minutes	ACN, PWD
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-013 BMA-009	437 524	BAT-010 BAT-012	June 9, 2011	12:00 – 12:30, 17:45 – 18:15	60 minutes	CLH, JHL
	Evening Visual Survey	BMA-013 BMA-009	437 524	BAT-010 BAT-012		22:55 – 23:00, 00:05 – 00:10	10 minutes	
	Evening Visual Survey	BMA-013 BMA-009	437 524	BAT-010 BAT-012	June 10, 2011	20:33 – 20:43 21:56 – 22:06	20 minutes	CLH, JHL
	Evening Visual Survey	BMA-013 BMA-009	437 524	BAT-010 BAT-012	June 13, 2011	21:26 – 22:29	57 minutes	JHL, BWW
	Acoustic Through-the-night	BMA-013 BMA-009	437 524	BAT-010 BAT-012	June 14, 2011	13:30 – 14:30	60 minutes	JHL, BWW

Monitoring: Station Maintenance Evening Visual Survey	BMA-013 BMA-009	437 524	BAT-010 BAT-012		23:20 – 00:20	60 minutes	
Evening Visual Survey	BMA-013 BMA-009	437 524	BAT-010 BAT-012	June 15, 2011	23:38 – 00:30	52 minutes	JHL, BWW
Evening Visual Survey	BMA-009	524	BAT-012	June 16, 2011	00:05 – 00:15	10 minutes	JHL, BWW
Evening Visual Survey	BMA-013 BMA-009	437 524	BAT-010 BAT-012	June 17, 2011	21:10 – 22:00	50 minutes	BWW, KTC
Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-013 BMA-009 BMA-013 BMA-009	437 524 437 524	BAT-010 BAT-012 BAT-010 BAT-012	June 18, 2011	16:20 – 17:30 21:15 – 21:55	1hr 10 minutes 40 minutes	BWW, KTC BWW, KNP
Evening Visual Survey	BMA-013 BMA-009	437 524	BAT-010 BAT-012	June 19, 2011	21:49 – 22:46	57 minutes	KTC, AMD
Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-004 BMA-001 BMA-013 BMA-009 BMA-004 BMA-001	541 504 437 524 541 504	BAT-011 BAT-014 BAT-010 BAT-012 BAT-011 BAT-014	June 20, 2011	18:27 – 20:00 21:32 – 00:36	1 hr 33 minutes 3 hrs 4 minutes	TAL, AMD
Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-011 BMA-013 BMA-004 BMA-009 BMA-011 BMA-001	483 437 541 524 483 504	BAT-013 BAT-010 BAT-011 BAT-012 BAT-013 BAT-014	June 21, 2011	18:17 – 18:45 21:02 – 23:31	28 minutes 2 hrs 29 minutes	TAL, AMD
Acoustic Through-the-night Monitoring: Station	BMA-013 BMA-004 BMA-009	437 541 524	BAT-010 BAT-011 BAT-012	June 22, 2011	12:19 – 18:30 23:13 – 00:04	6 hrs 11 minutes	TAL, KTC

	Maintenance Evening Visual Survey	BMA-001 BMA-013 BMA-009	504 437 524	BAT-014 BAT-010 BAT-012			51 minutes	
	Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-011 BMA-014 BMA-004 BMA-011	483 534 541 483	BAT-013 BAT-016 BAT-011 BAT-013	June 23, 2011	17:37 – 21:15 21:29 – 23:37	2 hrs 38 minutes 2 hrs 8 minutes	TAL, KNP, AGR TAL, KNP
	Evening Visual Survey	BMA-011 BMA-001 BMA-005	483 504 532	BAT-013 BAT-014 BAT-017	June 24, 2011	21:11 – 00:07	2 hrs 6 minutes	TAL, KNP
	Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-004 BMA-001 BMA-005 BMA-004 BMA-011 BMA-001 BMA-005	541 504 532 541 483 504 532	BAT-011 BAT-014 BAT-017 BAT-011 BAT-013 BAT-014 BAT-017	June 25, 2011	15:15 – 17:40 20:45 – 23:42	2 hrs 25 minutes 2 hrs 57 minutes	TAL, KNP
	Evening Visual Survey	BMA-005	532	BAT-017	June 26, 2011	23:45 – 23:55	10 minutes	KNP, AMD
	Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-011 BMA-004 BMA-011 BMA-001 BMA-005	483 541 483 504 532	BAT-013 BAT-011 BAT-013 BAT-014 BAT-017	June 27, 2011	20:40 – 20:50 20:50 – 23:36	10 minutes 2 hrs 46 minutes	KNP, IAR
	Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual	BMA-004 BMA-005 BMA-004 BMA-011 BMA-001	541 532 541 483 504	BAT-011 BAT-017 BAT-011 BAT-013 BAT-014	June 30, 2011	19:50 – 21:00 21:05 – 23:43	1 hr 10 minutes 2 hrs 38 minutes	CTK, KNP

	Survey	BMA-005	532	BAT-017				
	Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-001 BMA-004 BMA-011 BMA-001 BMA-005	504 541 483 504 532	BAT-014 BAT-011 BAT-013 BAT-014 BAT-017	July 1, 2011	14:10 – 14:50 21:07 – 23:42	40 minutes 2 hrs 35 minutes	KNP, KTC
	Acoustic Through-the-night Monitoring: Station Maintenance	BMA-011	483	BAT-013	July 2, 2011	15:10 – 15:30	20 minutes	GKM, BM
	Evening Visual Survey	BMA-004 BMA-011 BMA-001 BMA-005	541 483 504 532	BAT-011 BAT-013 BAT-014 BAT-017	July 4, 2011	21:40 – 00:10	2 hrs 30 minutes	CM, KNP
	Acoustic Through-the-night Monitoring: Station Maintenance Evening Visual Survey	BMA-005 BMA-004 BMA-011 BMA-001 BMA-005	532 541 483 504 532	BAT-017 BAT-011 BAT-013 BAT-014 BAT-017	July 5, 2011	14:05 – 14:30 21:43 – 00:12	25 minutes 2 hrs 29 minutes	CM, KNP
	Acoustic Through-the-night Monitoring: Station Removal Evening Visual Survey	BMA-004 BMA-011 BMA-001 BMA-004 BMA-001 BMA-005	541 483 504 541 504 532	BAT-011 BAT-013 BAT-014 BAT-011 BAT-014 BAT-017	July 6, 2011	12:10 – 14:30, 20:00 – 20:30 21:30 – 22:37	2 hrs 20 minutes, 30 minutes 1 hr 7 minutes	CM, KNP
	Acoustic Through-the-night Monitoring: Station Removal Evening Visual Survey	BMA-005 BMA-005	532 532	BAT-017 BAT-017	July 7, 2011	20:50 – 21:00 21:00 – 21:10	10 minutes 10 minutes	KNP, AMD

5.1.3 Evaluating Bat Maternity Colonies

5.1.4 Through-the-Night Acoustic Bat Monitoring

According to the 2010 guidance document *Bats and Bat Habitats: Guidelines for Wind Power Projects* (OMNR 2010), NRSI biologists conducted through-the-night acoustic bat monitoring at 12 locations in woodlands within 120m of proposed wind turbines in 2010 and 2011 (see Figure 3). The guidance document indicates that monitoring should be conducted beginning at dusk and continuing for 5 hours. NRSI conducted this monitoring on a total of 25 and 29 nights for 2010 and 2011 respectively, totaling more than 1070 hours of monitoring data. In 2010 monitoring began on the night of June 2/3 and lasted through the night of June 26/27. In 2011 monitoring began on the night of June 09/10 and lasted through the night of July 6/7. On some of the monitoring nights, monitoring occurred at more than one station on the same night, contributing to an overall 52 and 73 nights of monitoring, respectively. Detailed information on monitoring effort can be seen in Appendix I. While monitoring was typically conducted for more than 5 hours each night, the data was analyzed using the results from dusk until 5 hours after (2000–0100hrs).

On each monitoring night, a Pettersson D240X ultrasound bat detector was paired with a portable computer to record all bat activity. This monitoring system was powered by gel deep cycle batteries and left to record between 2-5 nights of data at a time. The portable computer recorded wave files at a moderate sampling rate of 22.2 kHz/sec, which typically provides ample sonogram resolution to identify the call sonograms of Ontario's bat species.

Each passive monitoring station was designed to record both Heterodyne and Time Expansion data simultaneously to allow for a full analysis of activity in the vicinity of monitoring stations. Although Time Expansion records broadband data, the Heterodyne setting typically records narrowband data within approximately 5kHz of the recording frequency. Based on call frequencies of Ontario bat species, a recording frequency of 35kHz was chosen to provide the most accurate representation of bat abundance through the study area. Representative calls of all of Ontario's bat species demonstrate that at least some of the call will overlap with the 30-40kHz detectable range. It is

Figure 3

Bluewater Wind Energy Centre: Bat Habitats

Monitoring Stations for Candidate Significant Bat Habitats

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

March 23, 2012
Project: NRSI-1075
Scale: 1:50 000 (11 x 17")
UTM Zone 17 NAD83

BMA-003 544
BMA-004 541
BMA-005 532
BMA-006 518
BMA-001 504
BMA-002 427
BMA-007 463
BMA-008 542
BMA-009 524
BMA-010 492
BMA-011 483
BMA-012 470
BMA-013 437
BMA-014 534
BMA-015 514
BAT-004
BAT-008
BAT-010
BAT-011
BAT-012
BAT-013
BAT-014
BAT-016
BAT-017
498
508
510
434
480
481
460
484

CRYSTAL SPRINGS RD
WILDWOOD RD
JERRY LANE
BAULCH BLVD
ELMSLIE DR
BLUE BLUFF RD
BRONSON LINE
MILL RD
VIENNA ST
LINDY AVE
WEBB RD
RAVINE ST
PAVILLION RD
EGERTON BEACH RD
WESTDELL DR
WOODLAND DR
DRIFTWOOD DR
HOMESTEAD HEIGHTS DR
HOMESTEAD RD
BLUEHAVEN RD
ROY ST
BLUEWATER HWY
DURAND-HURONVIEW RD
CREST BEACH RD
CREST RD
SHANGRILA RD
STAFFA RD
GOSHEN LINE
BABYLON LINE
CENTENNIAL RD
BLACKBUSH LINE
BLIND LINE
DANCELAND RD
SMIRNOFF LINE
BANNOCKBURN LINE
GULLEY LINE
CONC 5 RD
KIPPEN RD
PARR LINE
FANSVILLE LINE
BELLTSIL LINE

N

Note: The final boundaries of natural features, including bat habitats, are identified within the full Natural Heritage Assessment conducted by AECOM. This map is for general reference only.

0 1 2 3 Kilometers

Legend

- Study Area Boundary
- 120m Buffer
- Project Location
- Laydown Area
- Substation
- Proposed Turbine
- Bat Monitoring Station (BAT)
- Transmission Line
- Access Road
- Highway
- Primary Road
- Local Street
- Watercourse
- Waterbody
- Wetland
- Candidate Significant Bat Maternity Colony
- Woodland (<120m From Turbine)
- Woodland (>120m From Turbine)

442000 444000 446000 448000 450000 452000 454000 456000 458000 460000
4820000 4818000 4816000 4814000 4812000 4810000

Path: X:\1075_Bluewater\NRSI_1075B_Fig3_MonitoringStationsBatHabitat_50K_2012_03_23_SWM.mxd

possible that some distant or uncharacteristic calls were not picked up by the Heterodyne recordings, however when paired with the broadband recordings of the Time Expansion data, this data is expected to give an accurate representation of the bat activity and species found at each monitoring station.

5.1.5 Visual Bat Surveys

In addition to the passive monitoring described above, active visual and acoustic monitoring was undertaken to establish if any snags monitored may contain bat maternity colonies. These surveys occurred at a total of 2 and 6 locations in 2010 and 2011, respectively, and were conducted 18 and 62 times during the 2010 and 2011 monitoring seasons. Visual surveys were conducted at the same location as through-the-night acoustic monitoring stations, and can be seen on Figure 3. Visual surveys were not conducted at BMA-014 (BAT-016) as a result of a change in site investigation criteria used shortly after the station was set up. Surveys were conducted between sunset and midnight, and consisted of ten minute surveys at each point count location. During each survey, the observer used the manual trigger setting of the Pettersson D240X ultrasound detector, paired with an audio recorder, to record bat calls while listening to and observing the total number of bat passes during the survey.

The Heterodyne and species data collected from these visual monitoring surveys have been analyzed separately from the data collected from through-the-night acoustic monitoring.

Table 10. Bat Monitoring Conducted at the Bluewater Wind Energy Centre

Wildlife Habitat ID	Feature ID	Station	Woodland Composition	Wildlife Tree Characteristics
BMA-001	504	BAT-014	*Acer saccharum* (sugar maple) – *Fagus grandifolium* (American beech) forest.	A large sugar maple located approximately 20m in from the edge of the woodland. It is approximately 100 cm DBH and contains a large cavity. The overhead vegetation cover is 80%.
BMA-004	541	BAT-011		A willow snag in a very open clearing, which is largely hollow. It also has exfoliating bark and woodpecker holes. The snag is located 7m north of a creek running

				through the woodland.
BMA-005	532	BAT-017		Contains an area with several maple (*Acer* sp.) and American beech snags which are 4-15m in height, and 20-40cm dbh. There are a few weaker candidate snags within 30m of this group as well.
BMA-007	463	BAT-004	Deciduous woodland containing basswood (*Tilia americana*) and hickory (*Carya* sp.).	A dead elm found on the edge of the woodland. The edge is adjacent to a wet meadow riparian corridor. The overhead vegetation cover above the candidate tree is 20%.
BMA-008	542	BAT-008	This is a lowland deciduous maple-beech dominated forest.	A large dying black cherry.
BMA-009	524	BAT-012	*Acer saccharum* (sugar maple)-mixed hardwood deciduous forest.	A large, living basswood 10m into the woodlot. It contains a large cavity ~ 3m long, which begins at ground level. The DBH of this tree is ~70cm.
BMA-011	483	BAT-013		A live silver maple, ~1m dbh. One large branch has snapped off, and the tree has a crack and hollow. The hollow is 3m above the ground, 15-20cm wide at its widest, with an opening 1m in length
BMA-013	437	BAT-010	Ash (*Fraxinus* sp.) swamp.	Station set up at one of two large diameter candidate silver maples within 15m of each other. The east tree was monitored; it has one large dead limb, with exfoliating bark, woodpecker holes, and a cavity. This tree was monitored because its cavity is enclosed at the top (the neighbouring tree has a hollow limb which is broken off at the top, leaving it exposed).
BMA-014	534	BAT-016		A large (~70cm dbh) American beech snag. It is ~30m tall with a large cavity 3m from the ground and some exfoliating bark.

Table 11. Bat Habitat Evaluation of Significance Criteria

Concentration Area	Standards of Significance
Bat Maternity Colony	- Significant maternity colonies include at least 20 northern long-eared bats (*Myotis septentrionalis*) or little brown bats (*Myotis lucifugus*), 10 big brown bats (*Eptesicus fuscus*), or 5 adult, female, silver-haired bats (*Lasionycteris noctivagans*) (OMNR 2011a).
	NRSI has used acoustic monitoring passage rates of 1.0 passes/hr, 2.0 passes/hr and 4.0 passes/hr to represent baseline values for candidate SWH. These values roughly correspond to a maximum of 5, 10 or 20 individual bats per night (1.0 passes/hr, 2.0 passes/hr or 4.0 passes/hr through 5 hours of flight time). These values of 5, 10 and 20 individual bats will assist with the identification of significant bat maternity colony habitat for silver-haired bats (*Lasionycteris noctivagans)* and the two most common bat species in Ontario, big brown bat (*Eptesicus fuscus*), and little brown bat (*Myotis lucifugus*), respectively. As northern long-eared bats tend to be identified less frequently, NRSI has used the identification of 20 or more calls of the species recorded in a single night of acoustic monitoring, or during a 10-mintue visual survey, to represent a maximum of 20 individuals present at a station.

5.2 Pre-Construction Evaluation of Significance Survey Methodology

As a result of site investigations which were completed after the end of the 2011 bat monitoring period, NRSI has identified an additional 5 woodlands that were identified as having suitable habitat for a bat maternity colony, but could not be evaluated for significance during the appropriate monitoring season. For the purposes of this report, NRSI has treated these habitats as significant with the commitment to conduct pre-construction monitoring within these habitats to confirm whether these features are significant. Pre-construction monitoring will be conducted in accordance with the July 2011 *Bat and Bat Habitats* provincial guidelines, and results will be compared to the appropriate provincial standards discussed previously in this report. Any of these habitats determined to be significant will be subject to the potential impacts, mitigation measures, and follow-up monitoring programs outlined in Table 18. If any of these habitats are identified as being not significant when compared with provincial standards of significance, no specific mitigation measures are required, however generalized mitigation measures are recommended to be applied.

The features for which this pre-construction evaluation of significance survey will occur include BMA-002, BMA-003, BMA-010, BMA-012, and BMA-014.

Acoustic bat monitoring will occur at 10-30 candidate maternity colony trees in each candidate significant bat maternity colony habitat. Each tree will be surveyed once in June 2012 from one half hour before dusk until one hour after dusk to observe evidence of bats exiting. Monitoring will use high-powered spotlights and acoustic detectors to record species calls. Significant maternity colonies include at least 20 northern long-eared bats (*Myotis septentrionalis*) or little brown bats (*Myotis lucifugus*), 10 big brown bats (*Eptesicus fuscus*), or 5 adult, female, silver-haired bats (*Lasionycteris noctivagans*) (OMNR 2011a). The number of individuals observed exiting or entering candidate trees, combined with species recorded and their representation of total calls recorded at each tree, will be used to determine the number of individuals of each species utilizing a candidate tree.

The above monitoring program assumes that site access will be gained for each of the sites requiring monitoring. If site access cannot be granted, NRSI will discuss potential alternative evaluation methods to determine the significance of these habitats.

5.3 Evaluation of Significance Results

In accordance with the REA Regulation, the presence of candidate significant bat maternity colonies within the project area has been reviewed by NRSI biologists. NRSI has used the results of the site investigation to evaluate the significance of each of the candidate significant bat maternity colonies identified within the project area. This evaluation of significance has been conducted using evaluation criteria outlined in applicable guidance documents, including the Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000), and the Ecoregion Criteria Schedules addendum to the Significant Wildlife Habitat Technical Guide, for Ecoregion 6E (OMNR 2011a).

5.3.1 Bat Maternity Colonies

Bat maternity colonies are critical to the survival of local bat populations. These colonies are day roosts, inhabited specifically by females and juveniles, used for giving birth and raising young according to the Significant Wildlife Habitat Ecoregion Criteria Schedules for Ecoregion 6E (Draft, OMNR 2011a). Maternity colonies are located in both human

and natural formations. According to the 2011 Addendum to the SWHTG, maternity colonies can be found in tree cavities, vegetation and often in buildings. NRSI biologists have identified a total of 15 candidate significant bat maternity colonies located within 120m of the Bluewater Wind Energy Centre project location. The results of monitoring at each of these candidate bat maternity colonies which are within 120m of the project location are indicated below.

BMA-001 (BAT-014)

A total of 150 passes were recorded in 12 nights of acoustic monitoring at BAT-014. The number of passes recorded on a given night varied from 0 to 54. It had an overall passage rate of 2.91 passes/hour during the time period of 2200–0100hrs. The vast majority of bat calls (94%) were identified to the 30kHz range, which represents the call of either a big brown or a silver-haired bat. A total of 21 passes were recorded in 10 ten-minute visual point count surveys, with the number of passes observed during point counts ranging from 0 to 6. This results in an average passage rate of 12.6 passes/hour. A total of 4 calls were recorded during visual surveys, all of which were identified to the 30kHz range (big brown or silver-haired bat).

BMA-004 (BAT-011)

A total of 100 passes were recorded in 9 nights of acoustic monitoring at BAT-009. The number of passes recorded on a given night varied from 0 to 29. It had an overall passage rate of 2.63 passes/hour during the time period of 22:00 – 01:00hrs. No species calls were obtained from acoustic monitoring at this station. A total of 43 passes were recorded in 10 ten-minute visual point count surveys, with the number of passes observed during point counts ranging from 0 to 22. This results in an average passage rate of 25.80 passes/hour. A total of 20 calls were obtained from visual surveys, 40% of which were identified as eastern red bat, and 30% of which were identified to the 30kHz range (big brown or silver-haired bat).

BMA-005 (BAT-017)

A total of 2 passes were recorded in 9 nights of acoustic monitoring at BAT-017, which were both recorded on the night of July 5, 2011. This results in an overall passage rate of 0.06 passes/hour during the time period of 22:00 – 01:00hrs. No species calls were obtained from acoustic monitoring at this station. One pass was recorded in 10 ten-minute visual point count surveys. This results in an average passage rate of 0.60 passes/hour. No calls were obtained from visual surveys.

BMA-007 (BAT-004)

A total of 560 passes were recorded in 9 nights of acoustic monitoring at BAT-004. The number of passes recorded on a given night varied from 8 to 181. It had an overall passage rate of 12.44 passes/hour during the time period of 22:00 – 01:00hrs. Of the 147 calls obtained, 69% of these were little brown bats, with an additional 18% identified within the 30kHz range (big brown or silver-haired bat). A total of 76 passes were recorded in 9 ten-minute visual point count surveys, with the number of passes observed

during point counts ranging from 0 to 38. This results in an average passage rate of 50.67 passes/hour. A total of 34 calls were recorded from visual surveys at BAT-004. 21% of these were identified to the 30kHzrange (big brown or silver-haired bat), and 18% were identified as little brown bats.

BMA-008 (BAT-008)

A total of 67 passes were recorded in 9 nights of acoustic monitoring at BAT-008. The number of passes recorded on a given night varied from 0 to 36. It had an overall passage rate of 1.49 passes/hour during the time period of 22:00 – 01:00hrs. A total of 4 calls were identified from this acoustic monitoring station, 3 of which were identified to the 30kHz range (big brown or silver-haired bat), with the remaining identified as a little brown bat. A total of 3 passes were recorded in 9 ten-minute visual point count surveys, with the 3 passes observed during one point count. This results in an average passage rate of 2.00 passes/hour. Two calls were recorded during visual surveys. Both of these were identified as little brown bats.

BMA-009 (BAT-012)

A total of 3 passes were recorded in 13 nights of acoustic monitoring at BAT-012. One of these passes was observed on one night, with the remaining 2 observed on another. It had an overall passage rate of 0.05 passes/hour during the time period of 22:00 – 01:00hrs. Two calls were recorded, both of which were identified to the 30kHz range (either big brown bat or silver-haired bat). A total of 1 pass was recorded in 11 ten-minute visual point count surveys and 1 five-minute point count survey, with the 3 passes observed during one point count. This results in an average passage rate of 0.52 passes/hour. No calls were obtained from visual surveys.

BMA-011 (BAT-013)

A total of 2 passes were recorded in 14 nights of acoustic monitoring at BAT-013. These passes were observed on separate nights. This station had an overall passage rate of 0.04 passes/hour during the time period of 22:00 – 01:00hrs. Two calls were recorded, both of which were identified to the 30kHz range (either big brown bat or silver-haired bat). A total of 4 passes were recorded in 11 ten-minute visual point count surveys and 1 five-minute point count survey, with the 3 passes observed during one point count. This results in an average passage rate of 0.52 passes/hour. No calls were obtained from visual surveys.

BMA-013 (BAT-010)

A total of 369 passes were recorded in 13 nights of acoustic monitoring at BAT-010. The number of passes recorded on a given night varied from 0 to 85. This station had an overall passage rate of 6.05 passes/hour during the time period of 22:00 – 01:00hrs. The majority of bat calls (82%) were identified to the 30kHz range, which represents the call of either a big brown or a silver-haired bat. Another 9% of calls were identified as silver-haired bat. A total of 27 passes were recorded in 9 ten-minute visual point count surveys and 1 five-minute point count survey. On most nights, no bat passes were observed, however on one night, 26 passes were observed. These observations resulted in an average passage rate of 17.05 passes/hour. Visual monitoring at this station resulted in 12 calls, 7 of which were identified to the 30kHz range (big brown or silver-haired bat).

BMA-014 (BAT-016)

A total of 1 pass was recorded in 3 nights of acoustic monitoring at BAT-016. This station was removed after only 3 nights as a result of re-analysis of woodland and snag characteristics and prioritization of effort. This station had an overall passage rate of 0.07 passes/hour during the time period of 22:00 – 01:00hrs. This bat call was identified as belonging to a *Myotis* sp. Visual surveys were not conducted at this station. This woodland will be re-evaluated prior to construction to determine its significance.

NRSI has used overall passage rates and species data obtained from acoustic monitoring to estimate the number of individuals of a species found at candidate maternity colony habitats. The equation utilized to determine the number of individuals present is as follows:

$$I = 5P \times S_p$$

where I = number of individuals of a species
P= average passage rate
S_p= proportion of overall species composition

The average passage rate is multiplied by 5 to represent the estimated total number of individuals present in 5 hours (the acoustic monitoring period). The results of this analysis are displayed in Table 12 below.

The passage rates for visual surveys generally correspond to the results of acoustic monitoring, i.e., those stations with lower acoustic passage rates also had lower visual passage rates. Those stations with higher acoustic passage rates likewise had higher visual passage rates. However, the passage rates for visual surveys have not been used to specifically identify the number of individuals. While the trends in visual survey results generally reflect the results of acoustic monitoring, activity recorded during the 10-minute visual survey period does not necessarily represent typical activity of bats which are residing in close proximity to the station location (such as bats which would be exiting or entering a maternity colony), but may include bats which forage in the area on a particular night. Acoustic monitoring allows for the continual collection of data, and records bats foraging near the station location, but also bats which are entering or

exiting a maternity colony at the station. Bats were not directly observed to enter or exit a potential maternity colony during visual surveys at any of the candidate habitats evaluated.

For instances where no calls were obtained from acoustic monitoring to allow for species identification, the proportion of species present during visual surveys (combined with the passage rate acquired from acoustic monitoring) was utilized to interpret the number of individuals of a species present.

Table 12. Bat Monitoring Results for the Bluewater Wind Energy Centre

Wildlife Habitat ID	Station	Natural Feature ID	Acoustic Through-the-night Surveys			Visual Surveys	
			Average Passage Rate (P) (passes/hr)	Species Composition (S_p)	No. of Individuals $I = 5P \times S_p$	Average Passage Rate (passes/hr)	Species Composition
BMA-001	BAT-014	504	2.91	Total # calls: 31 30kHz (BB/SH): 94% Hoary: 3% Silver-haired: 3%	Total Individuals: 14.55 30kHz (BB/SH): 13.67 Hoary: 0.44 (1) Silver-haired: 0.44 (1)	12.60	Total # calls: 4 30kHz (BB/SH): 100%
BMA-004	BAT-011	541	2.63	No calls obtained	Total individuals: 13.15 *Species proportions used from Visual Surveys:* 30kHz (BB/SH): 3.95 40kHz (Red/Tric) 0.66(1) E. Red: 5.26 Silver-haired: 0.66(1) Little Brown: 0.66(1) Myotis sp.: 1.97	25.80	Total # calls: 20 30kHz (BB/SH): 30% 40kHz (Red/Tric) 5% E. Red: 40% Silver-haired: 5%. Little Brown: 5% Myotis sp.: 15%
BMA-005	BAT-017	532	0.06	No calls obtained	Total Individuals: 0.3 (1)	0.60	No calls obtained
BMA-007	BAT-004	463	12.44	Total # calls: 147 30kHz (BB/SH): 18% 40kHz (Red/Tric) <1% Big Brown: 9% Hoary: 2% Silver-haired: 1%. Little Brown: 69% Myotis sp.: <1%	Total Individuals: 62.20 30kHz (BB/SH): 11.00 40kHz (Red/Tric) 0.42 (1) Big Brown: 5.50 Hoary: 1.27 Silver-haired: 0.85(1) Little Brown: 42.74 Myotis sp.: 0.42(1)	50.67	Total # calls: 34 30kHz (BB/SH): 21% 40kHz (Red/Tric) 6% Big Brown: 3% Little Brown: 18% Myotis sp.: 9%
BMA-008	BAT-008	542	1.49	Total # calls: 4 30kHz (BB/SH): 75% Little Brown: 25%	Total Individuals: 7.45 30kHz (BB/SH): 5.59 Little Brown: 1.86	2.00	Total # calls: 2 Little Brown: 100%
BMA-009	BAT-012	524	0.05	Total # calls: 2 30kHz (BB/SH): 100%	Total Individuals: 0.25 (1) 30kHz (BB/SH): 0.25 (1)	0.52	No calls obtained

BMA-011	BAT-013	483	0.04	Total # calls: 2 30kHz (BB/SH): 100%	Total Individuals: 0.2 (1) 30kHz (BB/SH): 0.2 (1)	2.40	No calls obtained
BMA-013	BAT-010	437	6.05	Total # calls: 198 30kHz (BB/SH): 82% Big Brown: <1% Eastern Red: <1% Silver-haired: 9%. Little Brown: <1% N. Long-eared: 2% Myotis sp.: 5% Unknown: <1%	Total Individuals: 30.25 30kHz (BB/SH): 24.81 Big Brown: 0.15 (1) Eastern Red: 0.15 (1) Silver-haired: 2.72 Little Brown: 0.15 (1) N. Long-eared: 0.61 (1) Myotis sp.: 1.51 Unknown: 0.15 (1)	17.05	Total # calls: 12 30kHz (BB/SH): 58% 40kHz (Red/Tric): 8% Hoary: 8% Little Brown: 17% Unknown: 8%
BMA-014	BAT-016	534	0.07	Total # calls: 1 Myotis sp.: 100%	Total Individuals: 0.35 (1) Myotis sp: 0.35 (1)	Not Evaluated	

Table 13. Evaluation of Significance for Wildlife Habitat within 120m of the Bluewater Wind Energy Centre

Wildlife Habitat ID	Feature ID	Size (ha)	Composition	Distance to Project Location	Evaluation Methods	Evaluation Results	Provincial Criteria	Significance	Figure	EIS Required (Y/N)
BMA-001	504	92.53	*Acer saccharum* (sugar maple) – *Fagus grandifolium* (American beech) forest.	84 m (T 1)	Acoustic Monitoring	**Acoustic Results:** **13.67 Big Brown or Silver-haired Bats** 1 Hoary Bat 1 Silver-haired Bat	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Significant	4	**Yes**
BMA-002	427	0.73	Dominant *Fraxinus* sp. (ash species). Abundant *Acer saccharum* (sugar maple).	43 m (T 6)	Not Evaluated	Not Evaluated	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Assumed Significant	4	**Yes**
BMA-003	544	3.79	Dominant *Fraxinus americana* (white ash). Occasional *Ostrya virginiana* (ironwood), *Acer saccharum* (sugar maple), *Tilia americana* (basswood), and *Fagus grandifolia* (American beech).	73 m (T 7)	Not Evaluated	Not Evaluated	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Assumed Significant	4	**Yes**
BMA-004	541	29.65		43 m (T 7)	Acoustic Monitoring Supplemented with Visual Species Data	**Acoustic Results:** 3.95 Big Brown or Silver-haired Bats 1 E. Red or Tricoloured Bat 5.26 E. Red Bats 1 Silver-haired Bat 1 Little Brown Bat 1.97 Myotis sp.	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Not Significant	4	**No**
BMA-005	532	8.68		53 m (T 9)	Acoustic Monitoring	**Acoustic Results:** 1 Individual Species Unknown	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Not Significant	4	**No**
BMA-007	463	32.01	This woodland contains basswood (*Tilia americana*) and hickory (*Carya* sp.).	80 m (T 16)	Acoustic Monitoring	**Acoustic Results:** **11.00 Big Brown or Silver-haired Bats** 1 E. Red or Tricolored Bats 5.50 Big Brown Bats 1.27 Hoary Bats 1 Silver-haired Bat **42.72 Little Brown Bats** 1 Myotis sp.	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Significant	4	**Yes**
BMA-008	542	15.22	This is a lowland deciduous maple-beech dominated forest, determined to have relatively weak candidate trees because there are many young trees, and the large trees which exist are very healthy. Some snags are present, but most are very small or without holes,	40 m (T 19)	Acoustic Monitoring	**Acoustic Results:** **5.59 Big Brown or Silver-haired Bats** 1.86 Little Brown Bats	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Significant	4	**Yes**

			cracks or exfoliating bark. Canopy cover is dense.							
BMA-009	524	3.05	*Acer saccharum* (sugar maple)-mixed hardwood deciduous forest.	110 m (T 22)	Acoustic Monitoring	**Acoustic Results:** 1 Big Brown or Silver-haired Bat	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Not Significant	4	**No**
BMA-010	492	1.42	Abundant *Acer saccharum* (sugar maple). Occasional *Fraxinus americana* (white ash) and *Acer rubrum* (red maple). Rare *Prunus serotina* (black cherry) and *Ostrya virginiana* (ironwood).	118 m (T 24)	Not Evaluated	Not Evaluated	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Assumed Significant	4	**Yes**
BMA-011	483	6.88		94 m (T Alt2)	Acoustic Monitoring	**Acoustic Results:** 1 Big Brown or Silver-haired Bat	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Not Significant	4	**No**
BMA-012	470	1.50	Dominant *Fraxinus americana* (white ash). Abundant *Ulmus americana* (white elm) and *Acer saccharum* (sugar maple).	89 m (T 25)	Not Evaluated	Not Evaluated	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Assumed Significant	4	**Yes**
BMA-013	437	5.31	Ash (*Fraxinus* sp.) swamp.	91 m (T Alt3)	Acoustic Monitoring	**Acoustic Results:** **24.81 Big Brown or Silver-haired Bats** 1 Big Brown Bat 1 Eastern Red Bat 2.72 Silver-haired Bats 1 Little Brown Bat 1 N. Long-eared Bat 1.51 Myotis sp. 1 Unknown sp.	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Significant	4	**Yes**
BMA-014	534	51.79		39 m (T 33)	Acoustic Monitoring	**Acoustic Results:** 1 Myotis sp. Data Deficient	20 N. Long-eared Bats 20 Little Brown Bats 10 Big Brown Bats 5 adult, female Silver-haired Bats	Assumed Significant	4	**Yes**

Figure 4

Bluewater Wind Energy Centre: Bat Habitats

Significant Bat Habitat

Natural Resource Solutions Inc.
Aquatic & Terrestrial Wildlife Biologists

March 23, 2012
Project: NRSI-1075
Scale: 1:50 000 (11 x 17")
UTM Zone 17 NAD83

BMA-003 544
BMA-004 541
BMA-005 532
BMA-006 518
BMA-001 504
BMA-002 427
BMA-007 463
BMA-008 542
BMA-009 524
BMA-010 492
BMA-011 483
BMA-012 470
BMA-013 437
BMA-014 534
BMA-015 514
498
508
510
480
481
460
484

CRYSTAL SPRINGS RD
WILDWOOD RD
JERRY LANE
BAULCH BLVD
ELMSLIE DR
BLUE BLUFF RD
BRONSON LINE
LINDY AVE
WEBB RD
RAVINE ST
PAVILLION RD
EGERTON BEACH RD
WESTDELL DR
WOODLAND DR
DRIFTWOOD DR
HOMESTEAD HEIGHTS DR
HOMESTEAD RD
BLUEHAVEN RD
ROY ST
BLUEWATER HWY
DURAND-HURONVIEW RD
CREST BEACH RD
CREST RD
SHANGRILA RD
BLACKBUSH LINE
DANCELAND RD
STAFFA RD
GOSHEN LINE
CENTENNIAL RD
BABYLON LINE
BLIND LINE
MILL RD
VIENNA ST
SMIRNOFF LINE
BANNOCKBURN LINE
GULLEY LINE
PARR LINE
FANSVILLE LINE
CONC 5 RD
KIPPEN RD
BELL'S LINE

N

Note: The final boundaries of natural features, including bat habitats, are identified within the full Natural Heritage Assessment conducted by AECOM. This map is for general reference only.

0 1 2 3 Kilometers

Legend

- Study Area Boundary
- 120m Buffer
- Project Location
- Laydown Area
- Substation
- Proposed Turbine
- Transmission Line
- Access Road
- Highway
- Primary Road
- Local Street
- Watercourse
- Waterbody
- Wetland
- Significant Bat Maternity Colony
- Woodland (<120m From Turbine)
- Woodland (>120m From Turbine)

442000 444000 446000 448000 450000 452000 454000 456000 458000 460000
4820000 4818000 4816000 4814000 4812000 4810000

Path: X:\1075_Bluewater\NRSI_1075B_Fig4_SigBatHabitat_50K_2012_03_23_SWM.mxd

5.4 Evaluation of Significance Summary

Based on the records review and site investigation, no significant bat hibernacula were found within the project area. Based on criteria in the SWTHG (OMNR 2000), DRAFT Ecoregion Criteria Schedules Addendum to the SWHTG (OMNR 2009), DRAFT Significant Wildlife Habitat Ecoregion Criteria Schedules for Ecoregion 6E (OMNR 2011a), and Bats and Bat Habitats guidelines (OMNR 2010b, 2011b), NRSI identified 15 locations with candidate significant bat maternity habitat.

NRSI followed appropriate provincial guidelines to collect data during June and early July of 2010 and 2011, and has been able to evaluate the significance of 10 these locations. The remaining 5 potential bat habitats could not be surveyed during the appropriate monitoring season prior to the completion of this report.

Based on NRSI's data collection, 4 potential bat habitats (BMA-001, BMA-007, BMA-008, and BMA-013) were identified as significant habitats for bat maternity colonies as a result of passage rates and species assemblages which indicate the overall presence of a number of bats at these locations determined by provincial criteria to be significant. Although surveys could not be completed at habitats BMA-002, BMA-003, BMA-010, BMA-012, and BMA-014 due to constraints in site accessibility at the time surveys were conducted, as well as changes in site investigation critera, these features were identified as containing suitable habitat for roosting bats, and have been identified as being presumed significant for the purposes of the Environment Impact Study. The evaluation of significance of these ten habitats has been summarized in Table 14 below.

Table 14. Summary of Significant Bat Habitats within 120m of the Bluewater Wind Energy Centre

Wildlife Habitat ID	Feature ID	Feature Type	Distance to Closest Turbine (from blade tip)	Type of Significance	EIS Required (Y/N)
BMA-001	504	Significant Bat Maternity Colony	84 m (T 1)	Evaluated	Yes
BMA-002	427	Significant Bat Maternity Colony	43 m (T 6)	Assumed	Yes
BMA-003	544	Significant Bat Maternity Colony	73 m (T 7)	Assumed	Yes
BMA-007	463	Significant Bat	80 m (T 16)	Evaluated	Yes

		Maternity Colony			
BMA-008	542	Significant Bat Maternity Colony	40 m (T 19)	Evaluated	Yes
BMA-010	492	Significant Bat Maternity Colony	118 m (T 24)	Assumed	Yes
BMA-012	470	Significant Bat Maternity Colony	89 m (T 25)	Assumed	Yes
BMA-013	437	Significant Bat Maternity Colony	91 m (T Alt3)	Evaluated	Yes
BMA-014	534	Significant Bat Maternity Colony	39 m (T 33)	Assumed	Yes

According to the REA Regulation, if any significant natural features are present within 120m of the project location an Environmental Impact Study (EIS) must be completed. Potential impacts, mitigation measures, and follow-up programs associated with these 10 significant bat habitats are discussed in Section 6.0 below.

Other woodlands which are located within 120m of access roads, connection cabling, temporary construction and laydown areas, the substation, the operations and maintenance building, and the transmission line may contain suitable habitat for bat maternity colonies. These habitats are listed below in Table 15. These will be treated as significant, and generalized mitigation measures for these habitats will be applied. Generalized mitigation measures have been detailed as part of the EIS.

Table 15. Generalized Candidate Significant Bat Habitats identified within 120m of the Bluewater Wind Energy Project

Feature ID	Criteria Rationale	Type of Significance	EIS Required (Y/N)
426	This woodland was identified as a mid-aged, deciduous forest dominated by silver maple, ash and black walnut. Size class analysis unknown, however one cavity was noted. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
439	Mid-age deciduous forest containing ash and aspen in the canopy, with abundant trees 25-50cm DBH, but rarely occurring snags only at <25cm DBH. Abundance of appropriately sized trees which the potential to contain cavities suggests the habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures

456	Contains suitable mature white ash-beech and sugar maple-dominated deciduous forest and green ash swamp. Suitably sized trees are snags are found throughout, with abundant trees 25-50cm DBH occurring particularly in the sugar-maple dominated component. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
475	Suitable mid-aged dry-fresh sugar maple dominated deciduous forest. Abundant trees >25cm DBH and occasional >50cm DBH, as well as occasional snags >25cm DBH and rare snags >50cm DBH. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
487	Contains coniferous plantation, which does not qualify. However it also contains suitable mature dry-fresh sugar maple forest, with abundant trees >25cm DBH and occasional >50cm, occasional snags >25cm DBH and rare >50cm. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
488	Contains mid-aged green ash deciduous swamp, and maple mineral deciduous swamp which could contain suitable habitat. As a result this habitat may be suitable for a significant bat maternity colony. Note the thicket portion, which is found within 120m of a proposed turbine, does not qualify for candidate bat maternity colony habitat.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
494	Contains fresh-moist willow lowland deciduous forest, containing some Freeman's maple (*Acer* x *freemanii*). As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
512	Within 120m of the project location, contains fresh-moist lowland deciduous forest ecosite containing some Manitoba maple (*Acer negundo*). Mature trees (height category 1) noted. As a result this habitat may be suitable for a significant bat maternity colony. Some mixed swamp is also located within 120m of the project location, however this area in particular (within 120m) is represented by coniferous trees and as a result does not qualify.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
514	Potentially suitable habitat is found within 120m of the project location in maple mineral deciduous swamp and sugar maple deciduous forest. Abundant trees 25-50cm DBH were noted, as well as occasional trees >50cm DBH. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures

520	Mature deciduous forest containing sugar maple and trembling aspen. Additional information was not able to be obtained due to the distance of the woodland from the roadside. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
537	Mature dry-fresh sugar maple-beech, sugar maple-basswood deciduous forest, and swamp maple deciduous swamp. Contains abundant trees 25-50cm DBH and occasional trees >50cm DBH, as well as occasional snags both 25-50cm DBH and >50cm DBH. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
539	Contains mid-aged fresh-moist black walnut lowland deciduous forest, with some ash. There was no access to this property to confirm size class analysis. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
545	Mature dry-fresh sugar maple-beech deciduous forest. There was no access to this property to confirm size class analysis. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
551	Contains young to mid-aged white pine-black walnut mixed forest. It contains abundant trees >25cm DBH and rare trees >50cm DBH which could contain appropriate cavities. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
552	Consists of cultural woodland containing some white ash trees, however there are only occasional trees 25-50cm DBH and no snags noted. FOD is also found within 120m of the transmission line and due to a lack of site access and the inability to see this from the property line, this polygon may contain significant bat maternity colony habitat.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
555	Fresh-moist oak-maple-hickory deciduous forest, containing abundant trees 25-50cm DBH and rare trees >50cm DBH. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
556	Dry-fresh sugar maple deciduous forest, containing abundant trees 25-50cm DBH and rare trees >50cm DBH. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures
561	Swamp maple mineral deciduous swamp and lowland deciduous forest. There was no access to this property to confirm size class analysis. As a result this habitat may be suitable for a significant bat maternity colony.	Treat As Significant	Yes - Generalized Candidate Significant Wildlife Habitat Mitigation Measures

6.0 Environmental Impact Study

In accordance with the REA Regulation, any significant bat maternity colonies found within 120m of the project location require an Environmental Impact Study (EIS) to identify potential impacts and mitigation measures. The Evaluation of Significance for the Bluewater Wind Energy Centre has identified that 9 significant bat maternity colonies are present within 120m of the project location, with the potential to incur operational impacts from this development. The potential impacts on these features are discussed in more detail in the following sections.

6.1 Description of the Proposed Undertaking

The Bluewater Wind Energy Centre, proposed by NextEra Energy Inc., is located approximately 2.5km southeast of the town of Bayfield. This wind energy generating facility is proposed to be 60MW in size, consisting of up to 41 operational wind turbines, as well as supporting infrastructure and development activities. This includes access roads, construction areas, buried connector lines and overhead collector lines, substations, temporary laydown areas, and an operation/maintenance building.
The turbine model chosen for this project is the GE Energy 1.6-100 turbine. It stands 80m to the height of the hub with a blade length of 50m.

The installation of each turbine will involve a subterranean concrete base, and a temporary above-ground lay-down area where turbine components will be stored. Access roads will be gravel and will be placed throughout the project area, to allow for regular maintenance activities at each of the turbines. Connector cabling will be underground and will primarily follow the placement of the access road. Minor grading activities and site alteration is expected to occur along proposed access road routes and at turbine locations.

Based on current layouts, minor vegetation removal may occur during the construction of the Bluewater Wind Energy Centre and associated infrastructure. The extent of vegetation clearing, if any, and potential impacts of this project on vegetation communities and other significant wildlife habitat has been examined by AECOM, and is discussed in more detail in the full Natural Heritage Assessment reports.

A summary of the potential impacts that the proposed development may have on significant bat habitat is provided in Table 16 below.

Table 16. Summary of Potential Impacts to Significant Bat Habitat

Project Phase	Project Component	Description of Activity	Potential Impact(s)
Construction	Supporting Infrastructure	Installation of access roads, cabling, maintenance yards, auxiliary buildings, etc.	▪ Habitat Loss ▪ Noise
Construction	Wind Turbine Erection	Turbine pad grading, concrete pouring, turbine assembly.	▪ Noise
Operation	Wind Turbine Operation	Operation of 41 wind energy generating turbines.	▪ Noise ▪ Direct Bird/Bat Mortality
Decommissioning	Wind Turbine Removal	Removal of and disassembly of 41 wind energy generating turbines.	▪ Noise

The potential environmental impacts to bats and bat habitats associated with the development of the Bluewater Wind Energy Centre have been provided in detail in the following sections.

6.2 Potential Impacts to Significant Bat Habitat

6.2.1 Habitat Loss

As a result of the proposed development of the Bluewater Wind Energy Centre, it is not anticipated that significant bat maternity colonies will be impacted by direct habitat loss. Current layouts indicate that all proposed development is located outside of the boundaries of any significant bat habitats. Some cabling will be directionally drilled under the assumed significant feature BMA-014. As a result, this cabling will not be located within the feature, and will not involve the removal of any snags, cavity trees, or other specific locations suitable for maternity colonies, and no direct impacts from habitat loss are expected.

6.2.2 Noise Disturbance

Bat activity is generally limited to the period of twilight through sunrise. As with most wildlife, the noise associated with the construction activity has the potential to disturb regular bat activity. This disturbance, if any, will be a temporary disturbance limited to

the construction and decommissioning phases of this project and is not expected to permanently impact local bat populations.

In order to minimize any temporary disturbances to local bat populations, NRSI recommends that construction activity within 120m of significant bat habitat be limited to occur during daylight hours during the summer months (May 1st-August 31st) when bats are typically most active.

To assess any potential noise disturbances to local bat populations as a result of the regular operation of the wind turbines, NRSI recommends that post-construction acoustic bat monitoring be conducted at each of the significant bat habitats that are located within 120m of operational turbines. These surveys should occur for at least 3 years, in conjunction with mortality monitoring (discussed below). Since pre-construction monitoring surveys already conducted were completed following the 2010 Bat and Bat Habitats guidelines, NRSI recommends that the pre-construction monitoring approach be repeated during post-construction studies, rather than implementing the revised July 2011 approach for consistency and comparability. This monitoring will be further discussed in a separate document entitled the Environmental Effects Monitoring Plan.

6.2.3 Direct Bat Mortality

The placement of wind turbines within 120m of significant bat maternity colonies have the potential to result in direct bat mortality due to the operation of large-scale wind turbines. Overall bat mortality levels have been shown to be extremely variable through projects in North America, with an MNR summary of available literature indicating ranges of 0.07 - 47.5 bats/turbine/year (OMNR 2006).

Bat mortality resulting from collision with operational wind turbines is discussed in a separate document, called the Environmental Effects Monitoring Plan, which is a part of the Design and Operations Report for the Renewable Energy Approval application. As a result, impacts, mitigation, and monitoring concerning bat mortality are included within that document and will not be discussed in further detail within this report.

6.3 Approach to Impact Assessment

Following guidelines set out by the REA Regulation with regards to bats and bat habitats associated with wind turbines an impact assessment is required for a project of this scope. This impact assessment discusses potential impacts to significant bat habitats, in each of the construction, operation, and decommissioning phases of this project. In addition, NRSI has also considered generalized mitigation measures that should be applied in areas where non-operational impacts on bat habitats may occur. These generalized mitigation measures are meant to limit the temporary disturbance that may occur during the construction or decommissioning phases of this project.

6.3.1 Project Location within Significant Bat Habitat

NRSI has reviewed the project location and significant bat habitats and has confirmed that the project location does not overlap with any significant bat habitats. In one location, cabling is proposed to be directional drilled underneath a significant bat habitat, however since this activity will occur below the feature it is not considered to be within.

6.3.2 Project Location within 120m of Confirmed Significant Bat Habitat

Through extensive acoustic monitoring that occurred in 2010 and 2011 within the Bluewater Wind Energy Centre, NRSI has confirmed the significance of 4 bat maternity colonies within the project area. The potential impacts, proposed mitigation measures, objectives, and follow-up programs associated with these 4 significant wildlife habitats have been provided in Table 17 below.

Table 17. Summary of Impacts and Mitigation Measures Associated with Confirmed Significant Bat Habitat within 120m of the Bluewater Wind Energy Centre

Feature ID	Potential Impacts	Mitigation Measures	Objectives, Monitoring, and Contingency Plans
BMA-001 BMA-007 BMA-008 BMA-013	1. Habitat loss from construction activities within 120m. 2. Noise	1a. Construction activities will occur outside the boundaries of all significant bat habitats. 1b. The areas proposed for construction within 30m of significant bat habitats will be clearly delineated to avoid accidental impacts to significant bat habitat. 2. Focus construction	1. Avoid direct habitat loss of significant habitat to local bat populations. 2. Disturbance to bat

	disturbance from construction activities within 120m.	activities within 30m of this feature during daylight hours during the period of May 1st to August 31st.	populations should be minimized as much as possible during the construction phase.

6.3.3 Project Location within 120m of Assumed Significant Bat Habitat

As a result of site investigations which were completed after the end of the 2011 bat monitoring period, NRSI has identified an additional 5 woodlands that were identified as having suitable habitat for a bat maternity colony, but could not be evaluated for significance during the appropriate monitoring season. For the purposes of this report, NRSI has treated these habitats as significant with the commitment to conduct pre-construction monitoring within these habitats to confirm whether these features are significant. Pre-construction monitoring will be conducted in accordance with the July 2011 *Bat and Bat Habitats* provincial guidelines, and results will be compared to the appropriate provincial standards discussed previously in this report. Any of these habitats determined to be significant will be subject to the potential impacts, mitigation measures, and follow-up monitoring programs outlined in Table 18. If any of these habitats are identified as being not significant when compared with provincial standards of significance, no specific mitigation measures are required.

Table 18. Summary of Pre-construction Surveys and Evaluation Standards to Confirm Significance of the Assumed Significant Bat Habitat within 120m of the Bluewater Wind Energy Centre

Feature ID	Pre-construction Surveys	Evaluation of Significance Standards
BMA-002 BMA-003 BMA-010 BMA-012 BMA-014	Pre-construction surveys will follow July 2011 *Bat and Bat Habitats* guidelines to be consistent with other monitoring that has already occurred, and will occur, at the project area. Acoustic bat monitoring will occur at 10-30 candidate maternity colony trees in each woodland. Each tree will be surveyed once in June 2012 from one half hour before dusk until one hour after dusk to observe evidence of bats exiting. Monitoring will use	Significant maternity colonies include at least 20 northern long-eared bats (*Myotis septentrionalis*) or little brown bats (*Myotis lucifugus*), 10 big brown bats (*Eptesicus fuscus*), or 5 adult, female, silver-haired bats (*Lasionycteris noctivagans*) (OMNR 2011a). NRSI will use the number of individuals observed exiting or entering candidate trees, combined with species recorded and their representation of total calls recorded at each tree, to determine the number of individuals of each species utilizing a candidate tree.

	high-powered spotlights and acoustic detectors to record species calls.	

After the results of the above studies are compared against provincial standards of significance, NRSI will identify whether any of these bat maternity colonies warrant significant consideration. If they do, the following table of potential impacts, mitigation measures, and follow-up programs should be applied.

Table 19. Summary of Impacts and Mitigation Measures Associated with Bat Habitats Confirmed to be Significant Through Pre-construction Monitoring Surveys

Feature ID	Potential Impacts	Mitigation Measures (if significant)	Objectives, Monitoring, and Contingency Plans (if significant)
BMA-002 BMA-003 BMA-010 BMA-012 BMA-014	1. Habitat loss from construction activities within 120m.	1a. Construction activities will occur outside the boundaries of all significant bat habitats. 1b. The areas proposed for construction within 30m of significant bat habitats will be clearly delineated to avoid accidental impacts to significant bat habitat.	1. Avoid direct habitat loss of significant habitat to local bat populations.
	2. Noise disturbance from construction activities within 120m.	2. Focus construction activities within 30m of this feature during daylight hours during the period of May 1st to August 31st.	2. Disturbance to bat populations should be minimized as much as possible during the construction phase.

6.3.4 Generalized Mitigation Measures

In addition to the specific significant bat maternity colonies identified above, where operational impacts may occur, there are a number of additional potential bat habitats that are located within 120m of project components that are not expected to result in operational impacts to these habitats, as per Appendix D of the Natural Heritage Assessment Guide (OMNR 2011c). As a result, NRSI is recommending generalized mitigation measures that should be applied to development activities within 120m of the 18 identified generalized candidate significant bat maternity colony habitats. These generalized mitigation measures are provided in Table 20 below.

Table 20. Summary of Generalized Mitigation Measures within 120m of the Bluewater Wind Energy Centre

Development Phase	Potential Impacts	Mitigation Measures
Construction/ Decommissioning	Habitat Loss	1. Keep vegetation removal to a minimum and limited to non-significant habitats. 2. Clearly delineate construction boundaries where construction will occur within 10m of habitats to avoid accidental damage to tree species.
	Wildlife Disturbance	1. Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight hours, wherever possible. 2. Maintain the largest possible distance between construction activity and wooded habitats, respecting the limits of the constructible area.

6.4 Impact and Mitigation Summary

The records review, site investigation, and evaluation of significance have all been used to guide the proposed development and assess the potential impacts that the Bluewater Wind Energy Centre may have on bats and bat habitats.

Proposed development activities indicate that most turbines are located further than 120m away from significant bat habitat with the exception of T1, T6, T7, T16, T19, T24, T25, TAlt3, and T33, which are all located within 120m of significant bat habitat. A summary of the 10 significant bat habitats, all identified as bat maternity colonies, found within the project area, including distance to project location, can be seen in Table 21 below.

Table 21. Summary of Significant Bat Maternity Colonies and Proximity to Project Location for the Bluewater Wind Energy Centre area

Type of Natural Feature	Wildlife Habitat ID	Distance to Nearest Turbine	Turbine No.
Seasonal Concentration Area			
Bat Maternity Colony	BMA-001	84m	T 1
Bat Maternity Colony	BMA-002	43m	T 6
Bat Maternity Colony	BMA-003	73m	T 7
Bat Maternity Colony	BMA-007	80m	T 16

Bat Maternity Colony	BMA-008	40m	T 19
Bat Maternity Colony	BMA-010	118m	T 24
Bat Maternity Colony	BMA-012	89m	T 25
Bat Maternity Colony	BMA-013	91m	T Alt3
Bat Maternity Colony	BMA-014	39m	T 33

The impacts to bat populations within the Bluewater Wind Energy Centre project area, excepting mortality impacts as discussed above, will be minimal, as no loss of significant habitat is anticipated. Pre-construction monitoring results at the Bluewater Wind Energy Centre have identified 9 woodlands that support significant bat maternity colonies. The results of this monitoring indicate that bat use of the area is generally low, with an average passage rate from dusk to 5 hours after ranging from 0.04 passes/hr to 12.44 passes/hr. Based on the presence of significant bat habitats within 120m of the Bluewater Wind Energy Centre location, NRSI has recommended a series of mitigation measures that should be applied during the development of this facility. A summary of these mitigation measures is provided in Table 22 below.

Table 22. Summary of Mitigation Commitments for the Development within 120m of Significant Bat Habitats at the Bluewater Wind Energy Centre

Development Phase	Potential Impact	Mitigation Measure
Construction, Decommissioning	Habitat Loss	Construction activities will occur outside the boundaries of significant bat habitats.
		Areas proposed for construction within 30m of significant bat habitat will be clearly delineated to avoid accidental impacts to significant bat habitat
	Noise Disturbance	Construction activities that must occur during the critical period for bat roosting (May 1st to August 31st) will occur during daylight hours.
		Maintain the largest possible distance from construction activities to wooded habitats, respecting limits of the constructible area.
Operation	Direct Mortality	Addressed in a separate document, entitled the Environmental Effects Monitoring Plan.
	Noise Disturbance	

In addition to mitigation measures to limit the potential impact to bats and bat habitats, a series of monitoring commitments are also recommended to occur at the Bluewater Wind Energy Centre. These monitoring commitments include both behaviour (disturbance) surveys and mortality surveys, and are designed to assess the impacts of this facility on local bat populations and habitat. These monitoring commitments are summarized in Table 21 below.

Table 23. Summary of Monitoring Commitments for the Bluewater Wind Energy Centre

Survey Type	Generalized Methods	Wildlife Habitat/ Feature	Purpose
Evaluation of Significance Surveys	Visual surveys of unevaluated candidate significant bat maternity colony habitats, following July 2011 MNR protocol, to occur prior to construction in June of 2012.	BMA-002 / 427 BMA-003 / 544 BMA-010 / 492 BMA-012 / 470 BMA-014 / 534	To confirm or deny the significance of bat maternity colonies in unevaluated candidate significant habitats (currently assumed significant).
Bat Behaviour Surveys	Visual and acoustic surveys of these significant bat habitats found within 30m of the project location. Discussed within the Environmental Effects Monitoring Plan.	BMA-001 BMA-007 BMA-008 BMA-013	To confirm bat abundance and species associations within this habitat have not been impacted by the Bluewater Wind Energy Centre.
Bat Behaviour Surveys	Visual surveys of confirmed significant bat maternity colony habitats. Discussed within the Environmental Effects Monitoring Plan.	If Significant: BMA-002 / 427 BMA-003 / 544 BMA-010 / 492 BMA-012 / 470 BMA-014 / 534	To confirm bat abundance and species associations within this habitat have not been impacted by the Bluewater Wind Energy Centre.
Post-construction Mortality Monitoring	Mortality monitoring for at least 3 years following July 2011 MNR guidelines. A detailed program will be prepared as part of the Environmental Effects Monitoring Plan.	Subset of the up to 41 operational turbines	To confirm direct impacts to bats as a result of the Bluewater Wind Energy Centre.

7.0 Summary and Conclusions

A detailed assessment of the bat habitats and bat activity within the proposed Bluewater Wind Energy Centre occurred through the use of a records review, comprehensive site investigation, and evaluation of significance by Natural Resource Solutions Inc. biologists.

The proposed Bluewater Wind Energy Centre is a 60MW wind energy facility located in Dufferin County, Ontario, and consists of the proposed installation of up to 41 wind energy turbines and associated infrastructure, primarily in agricultural habitat. In accordance with the Renewable Energy Approval (REA) Regulation, a records review, comprehensive site investigation, and evaluation of significance were all completed at the Bluewater Wind Energy Centre. This information has been compiled into this *Bat Monitoring Report and Environmental Impact Study*.

The results of the preliminary site investigation identified 13 potentially significant bat habitats within 120m of project components deemed to have a potential operational impact (i.e. wind turbines), or within which the project will be located (i.e. access road and cabling for Turbine 5). In order to confirm significance, extensive bat monitoring occurred at 9 of these habitats in 2010 and 2011. Monitoring at the remaining 4 habitats was not conducted because of site accessibility at the time of the 2011 monitoring period. Based on the results of the both the site investigation and evaluation of significance, NRSI has determined that 9 of the 13 habitats warrant significant consideration for bat maternity habitats. This determination is based on a combination of habitat present, overall bat abundance, and species associations observed at these habitats. As a result of the significant determination, NRSI has outlined numerous mitigation measures and monitoring commitments that should be specifically applied to any development activity within 120m of these significant habitats.

The monitoring conducted at one of the 9 habitats surveyed did not gain enough data to confirm or deny significant consideration, and as a result it has been assumed significant. In addition to this habitat, the remaining 4 unsurveyed habitats have also been assumed significant for the purposes of this report.

NRSI has also identified the presence of other suitable bat habitats within 120m of project components that are not expected to have operational impacts on bat habitats (i.e. access roads, cabling, etc.). In accordance with the Natural Heritage Assessment Guide, Appendix D, generalized mitigation measures can be applied to these features to mitigate against potential disturbances during the construction and decommissioning phases of this project. NRSI has provided several mitigation measures that should be applied during the development of this project to ensure impacts to bats and bat habitats are limited.

Providing that the appropriate recommendations are followed and that best management practices are implemented, the anticipated impacts of this facility on significant bat habitat and local bat populations are expected to be minimal.

8.0 References

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Appendix I
Evaluation of Significance Survey Dates

Appendix II. Evaluation of Significance Survey Dates

Purpose	Wildlife Habitat ID	Feature ID	Station Number	General Methods	Date	Time(s) and Duration	Weather	Staff
Acoustic Through-the-night Monitoring								
Quantitative assessment of bats at candidate maternity roosts	BMA-001	504	BAT-014	Monitoring Station Set Up	June 20, 2011	18:27	23˚C, 100%CC, No precipitation, Wind 1 from SW.	TAL, AMD
				Replacing memory and power supply for monitoring station	June 22, 2011	16:36	24˚C, 40%CC, No precipitation, Wind 3 from SE.	KTC, TAL
					June 25, 2011	17:15	25˚C, 20%CC, No precipitation, Wind 3-4 from W.	TAL, KNP
					July 1, 2011	14:10	26˚C, 35%CC, No precipitation, Wind 2 from W.	KTC, KNP
				Monitoring Station Removed	July 6, 2011	12:10		CM, KNP
	BMA-002	427	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-003	544	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-004	541	BAT-011	Monitoring Station Set Up	June 20, 2011	19:40	25˚C, 50%CC, No precipitation, Wind 0.	TAL, AMD
				Replacing memory and power supply for monitoring station	June 22, 2011	17:49	24˚C, 80%CC, No precipitation, Wind 2 from SE.	KTC, TAL
					June 25, 2011	15:15	25˚C, 40%CC, No precipitation, Wind 3 from W.	TAL, KNP
					June 30, 2011	20:50	17˚C, 0%CC, No precipitation, Wind 0.	CTK, KNP
				Monitoring Station Removed	July 6, 2011	13:35	31˚C, 80%CC, No precipitation, Wind 1 from W.	CM, KNP
	BMA-005	532	BAT-017	Monitoring Station Set Up	June 25, 2011	16:05	25˚C, 25%CC, No precipitation, Wind 2 from W.	TAL, KNP
				Replacing memory and power supply for monitoring station	June 30, 2011	19:50	18˚C, 0%CC, No precipitation, Wind 0.	CTK, KNP
					July 5, 2011	14:05	31˚C, 80%CC, No precipitation, Wind 1 from W.	CM, KNP
				Monitoring Station Removed	July 7, 2011	20:50	19˚C, 95%CC, No precipitation, Wind 0.	KNP, AMD
	BMA-007	463	BAT-004	Monitoring Station Set Up	June 2, 2010	19:55	100%CC, No precipitation, Wind 1 from N.	AGR, ACN
				Replacing memory and power supply for monitoring station	June 10, 2010	11:00	15˚C, 75%CC, No precipitation, Wind 2 from NW.	ACN, BK

					June 16, 2010	13:07	18°C, 100%CC, No precipitation, Wind 4 from SW.	ACN, BK
				Monitoring Station Removed	June 21, 2010	11:30		
	BMA-008	542	BAT-008	Monitoring Station Set Up	June 4, 2010	13:09	32°C, 70%CC, No precipitation, Wind 2 from S.	ACN
				Replacing memory and power supply for monitoring station	June 10, 2010		20°C, 0%CC, No precipitation, Wind 3 from N.	PWD, MA
					June 14, 2010	14:00	20°C, 90%CC, No precipitation, Wind 2 from NW	BK
					June 18, 2010	13:45	27°C, 30%CC, No precipitation, Wind 2 from W.	PWD, BK
				Monitoring Station Removed	June 21, 2010	13:52		
	BMA-009	524	BAT-012	Monitoring Station Set Up	June 9, 2011	17:45	15°C, 85%CC, No precipitation, Wind 3 from NW.	CLH, JHL
				Replacing memory and power supply for monitoring station	June 14, 2011	13:30	21°C, 10%CC, No precipitation, Wind 2 from NE.	JHL, BWW
					June 18, 2011	17:15	26°C, 10%CC, No precipitation, Wind 3 from NW.	BWW, KTC
				Monitoring Station Removed	June 22, 2011	13:24	24°C, 40%CC, No precipitation, Wind 3 from SE.	TAL, KTC
	BMA-010	492	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-0011	483	BAT-013	Monitoring Station Set Up	June 21, 2011	18:17	24°C, 70%CC, No precipitation, Wind 2 from E.	TAL, AMD
				Replacing memory and power supply for monitoring station	June 23, 2011	21:07	21°C, 100%CC, Rain, Wind 1 from SW	TAL, KNP, AGR
					June 27, 2011	20:50	22°C, 95%CC, No precipitation, Wind 2 from SW.	IAR, KNP
					July 2, 2011	15:10	28°C, 50%CC, No precipitation, Wind 1.	GKM, BM
				Monitoring Station Removed	July 6, 2011	20:00		CM, KNP
	BMA-012	470	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-013	437	BAT-010	Monitoring Station Set Up	June 9, 2011	12:00	20°C, 100%CC, No precipitation, Wind 2 from NE.	CLH, JHL
				Replacing memory and power supply for monitoring station	June 14, 2011	14:00	23°C, 10%CC, No precipitation, Wind 2 from NE.	JHL, BWW
					June 18, 2011	16:20	26°C, 5%CC, No precipitation, Wind 3 from NW.	BWW, KTC
				Monitoring Station Removed	June 22, 2011	12:19	24°C, 40%CC, No precipitation, Wind 3 from SE.	TAL, KTC
	BMA-014	534	BAT-016	Monitoring Station Set Up	June 23, 2011	17:37	21°C, 100%CC, No	TAL, KNP,

							precipitation, Wind 2 from SW.	AGR
Evening Visual Surveys								
Quantitative assessment of bats at candidate maternity roosts	BMA-001	504	BTR-014	Visual Survey with Manual Acoustic Recording	June 20, 2011	23:28 - 23:38 10 minutes	24˚C, 50%CC, No precipitation, Wind 0.	TAL, AMD
					June 21, 2011	22:50 - 23:00 10 minutes	25˚C, 80%CC, No precipitation, Wind 3 from SE. Thunder and lightning in the distance.	TAL, AMD
					June 24, 2011	22:37 - 22:47 10 minutes	17˚C, 100%CC, No precipitation, Wind 1 from W.	TAL, KNP
					June 25, 2011	22:20 - 22:30 10 minutes	16˚C, 30%CC, No precipitation, Wind 0.	TAL, KNP
					June 27, 2011	22:27 - 22:37 10 minutes	22˚C, 95%CC, Light rain starting at 22:30, Wind 2 from SW.	IAR, KNP
					June 30, 2011	22:15 - 22:25 10 minutes	17˚C, 0%CC, No precipitation, Wind 0.	KNP, CTK
					July 1, 2011	21:07 - 21:17 10 minutes	21˚C, 35%CC, No precipitation, Wind 0.	KNP,KTC
					July 4, 2011	21:40 - 21:50 10 minutes	16˚C, 10%CC, No precipitation, Wind 1 from S.	CM, KNP
					July 5, 2011	23:06 - 23:16 10 minutes	21˚C, 50%CC, No precipitation, Wind 1 from NW.	CM, KNP
					July 6, 2011	22:27 - 22:37 10 minutes	17˚C, 20%CC, No precipitation, Wind 3 from SW.	CM, KNP
	BMA-002	427	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-003	544	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-004	541	BTR-011	Visual Survey with Manual Acoustic Recording	June 20, 2011	22:30 - 22:40 10 minutes	24˚C, 50%CC, No precipitation, Wind 0.	TAL, AMD
					June 21, 2011	23:21 - 23:31 10 minutes	25˚C, 80%CC, No precipitation, Wind 3 from SE. Thunder and lightning in the distance.	TAL, AMD
					June 23, 2011	23:27 - 23:37 10 minutes	20˚C, 100%CC, Rain, Wind 2 from SW.	TAL, KNP
					June 25, 2011	23:32 - 23:42 10 minutes	16˚C, 30%CC, No precipitation, Wind 0.	TAL, KNP
					June 27, 2011	23:26 - 23:36 10 minutes	22˚C, 95%CC, No precipitation, Wind 2 from SW.	IAR, KNP
					June 30, 2011	21:05 - 21:15 10 minutes	17˚C, 0%CC, No precipitation, Wind 0.	KNP, CTK
					July 1, 2011	21:34 - 21:44 10 minutes	21˚C, 35%CC, No precipitation, Wind 0.	KNP,KTC

					July 4, 2011	22:35 - 22:45 10 minutes	16˚C, 10%CC, No precipitation, Wind 1 from S.	CM, KNP
					July 5, 2011	00:02 - 00:12 10 minutes	21˚C, 50%CC, No precipitation, Wind 1 from NW.	CM, KNP
					July 6, 2011	21:30 - 21:40 10 minutes	17˚C, 20%CC, No precipitation, Wind 3 from SW.	CM, KNP
	BMA-005	532	BTR-017	Visual Survey with Manual Acoustic Recording	June 24, 2011	23:57 - 00:07 10 minutes	17˚C, 100%CC, No precipitation, Wind 1 from W.	TAL, KNP
					June 25, 2011	22:56 - 23:06 10 minutes	16˚C, 30%CC, No precipitation, Wind 0.	TAL, KNP
					June 26, 2011	23:45 - 23:55 10 minutes	16˚C, 0%CC, No precipitation, Wind 0.	AMD, KNP
					June 27, 2011	22:58 - 23:08 10 minutes	22˚C, 95%CC, Light rain, Wind 2 from SW.	IAR, KNP
					June 30, 2011	21:43 - 21:53 10 minutes	17˚C, 0%CC, No precipitation, Wind 0.	KNP, CTK
					July 1, 2011	22:08 - 22:18 10 minutes	21˚C, 35%CC, No precipitation, Wind 0.	KNP, KTC
					July 4, 2011	22:08 - 22:18 10 minutes	16˚C, 10%CC, No precipitation, Wind 1 from S.	CM, KNP
					July 5, 2011	23:34 - 23:44 10 minutes	21˚C, 50%CC, No precipitation, Wind 1 from NW.	CM, KNP
					July 6, 2011	22:05 - 22:15 10 minutes	17˚C, 20%CC, No precipitation, Wind 3 from SW.	CM, KNP
					July 7, 2011	21:00 - 21:10 10 minutes	19˚C, 95%CC, No precipitation, Wind 0.	AMD, KNP
	BMA-007	463	BTR-004	Visual Survey with Manual Acoustic Recording	June 2, 2010	20:57 - 21:07 10 minutes	100%CC, No precipitation, Wind 1 from N. Heavy rain with thunderstorms earlier in the day.	AGR, ACN
					June 3, 2010	21:15 - 21:25 10 minutes	17˚C, 30%CC, No precipitation, Wind 3 from NW.	AGR
					June 7, 2010	21:39 - 21:49 10 minutes	11˚C, 0%CC, No precipitation, Wind 2 from NW. Cool.	ACN, PWD
					June 8, 2010	21:20 - 21:30 10 minutes	15˚C, 100%CC, No precipitation, Wind 2 from E.	PWD, MA
					June 10, 2010	22:11 - 22:22 10 minutes	17˚C, 100%CC, No preciptiation, Wind 2 from N.	ACN, BK
					June 13, 2010	22:14 - 22:24 10 minutes	16˚C, 100%CC, No precipitation, Wind 1 from NE.	ACN, BK
					June 14, 2010	22:35 - 22:45 10 minutes	19˚C, 90%CC, No precipitation, Wind 1 from N.	ACN, BK

					June 15, 2010	22:16 - 22:26 10 minutes	21˚C, 80%CC, No precipitation, Wind 3 from E.	ACN, BK
					June 16, 2010	22:22 - 22:32 10 minutes	14˚C, 100%CC, Light rain, Wind 5 from NW.	ACN, BK
	BMA-008	542	BTR-008	Visual Survey with Manual Acoustic Recording	June 6, 2010	22:18 - 22:28 10 minutes	12˚C, 90%CC, No precipitation, Wind 2. Wet, cool.	ACN, PWD
					June 7, 2010	00:16 - 00:26 10 minutes	11˚C, 0%CC, No precipitation, Wind 2 from NW. Cool.	ACN, PWD
					June 8, 2010	23:52 - 00:02 10 minutes	15˚C, 100%CC, No precipitation, Wind 2 from E.	PWD, MA
					June 9, 2010	21:06 - 21:16 10 minutes	19˚C, 90%CC, No precipitation, Wind 3 from S. Heavy rain started after end of survey.	ACN, BK
					June 10, 2010	20:45 - 20:55 10 minutes	17˚C, 100%CC, No preciptiation, Wind 2 from N.	ACN, BK
					June 13, 2010	20:51 - 21:01 10 minutes	16˚C, 100%CC, No precipitation, Wind 1 from NE.	ACN, BK
					June 14, 2010	21:14 - 21:24 10 minutes	19˚C, 90%CC, No precipitation, Wind 1 from N.	ACN, BK
					June 15, 2010	20:53 - 21:03 10 minutes	21˚C, 80%CC, No precipitation, Wind 3 from E.	ACN, BK
					June 16, 2010	21:01 - 21:11 10 minutes	14˚C, 100%CC, Light rain, Wind 5 from NW.	ACN, BK
	BMA-009	524	BTR-012	Visual Survey with Manual Acoustic Recording	June 9, 2011	00:05 - 00:10 10 minutes	11˚C, 10%CC, No precipitation, Wind 1 from NW.	CLH, JHL
					June 10, 2011	20:33 - 20:43 10 minutes	16˚C, 55%CC, No precipitation, Wind 3 from NW.	CLH, JHL
					June 13, 2011	21:26 - 21:36 10 minutes	15˚C, 80%CC, No precipitation, Wind 3 from NW.	JHL, BWW
					June 14, 2011	23:20 - 23:30 10 minutes	12˚C, 15%CC, No precipitation, Wind 0-1.	JHL, BWW
					June 15, 2011	00:20 - 00:30 10 minutes	75%CC, No precipitation, Wind 1 from S.	JHL, BWW
					June 16, 2011	00:05 - 00:15 10 minutes	15˚C, 20%CC, No precipitation, Wind 1.	JHL, BWW
					June 17, 2011	21:50 - 22:00 10 minutes	18˚C, 10%CC, No precipitation, Wind 1.	BWW, KTC
					June 18, 2011	21:15 - 21:25 10 minutes	18˚C, 10%CC, No precipitation, Wind 3 from NW.	BWW, KNP
					June 19, 2011	21:49 - 21:59 10 minutes	22˚C, 20%CC, No precipitation, Wind 2 from SE.	KTC, AMD
					June 20, 2011	00:26 - 00:36	24˚C, 50%CC, No precipitation,	TAL, AMD

						10 minutes	Wind 0.	
					June 21, 2011	22:14 - 22:24 10 minutes	25˚C, 80%CC, No precipitation, Wind 3 from SE. Thunder and lightning in the distance.	TAL, AMD
					June 22, 2011	23:54 – 00:04 10 minutes	18˚C, Light rain, Wind 1 from SW. Post-thunderstorm survey: some lightning in the distance.	TAL, KTC
	BMA-010	492	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-011	483	BTR-013	Visual Survey with Manual Acoustic Recording	June 20, 2011	21:32 - 21:42 10 minutes	24˚C, 50%CC, No precipitation, Wind 0.	TAL, AMD
					June 21, 2011	21:38 - 21:48 10 minutes	25˚C, 80%CC, No precipitation, Wind 3 from SE. Thunder and lightning in the distance.	TAL, AMD
					June 23, 2011	21:29 - 21:39 10 minutes	20˚C, 100%CC, Rain, Wind 2 from SW.	TAL, KNP
					June 24, 2011	21:11 - 21:21 10 minutes	17˚C, 100%CC, No precipitation, Wind 1 from W.	TAL, KNP
					June 25, 2011	20:45 - 20:55 10 minutes	16˚C, 30%CC, No precipitation, Wind 0.	TAL, KNP
					June 27, 2011	20:50 - 21:00 10 minutes	22˚C, 95%CC, No precipitation, Wind 2 from SW.	IAR, KNP
					June 30, 2011	23:33 - 23:43 10 minutes	17˚C, 0%CC, No precipitation, Wind 0.	KNP, CTK
					July 1, 2011	23:32 - 23:42 10 minutes	21˚C, 35%CC, No precipitation, Wind 0.	KNP,KTC
					July 4, 2011	00:00 - 00:10 10 minutes	16˚C, 10%CC, No precipitation, Wind 1 from S.	CM, KNP
					July 5, 2011	21:43 - 21:53 10 minutes	21˚C, 50%CC, No precipitation, Wind 1 from NW.	CM, KNP
	BMA-012	470	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				
	BMA-013	437	BTR-010	Visual Survey with Manual Acoustic Recording	June 9, 2011	22:55 - 23:05 10 minutes	11˚C, 10%CC, No precipitation, Wind 1 from NW.	CLH, JHL
					June 10, 2011	21:56 - 22:06 10 minutes	16˚C, 55%CC, No precipitaiton, Wind 3 from NW.	CLH, JHL
					June 13, 2011	22:19 - 22:29 10 minutes	15˚C, 80%CC, No precipitation, Wind 3 from NW.	JHL, BWW
					June 14, 2011	00:10 - 00:20 10 minutes	12˚C, 15%CC, No precipitation, Wind 0-1.	JHL, BWW
					June 15, 2011	23:38 - 23:48 10 minutes	75%CC, No precipitation, Wind 1 from S.	JHL, BWW
					June 17, 2011	21:10 - 21:20	18˚C, 10%CC, No precipitation,	BWW, KTC

						10 minutes	Wind 1.	
					June 18, 2011	21:45 - 21:55 10 minutes	18˚C, 10%CC, No precipitation, Wind 3 from NW.	BWW, KNP
					June 19, 2011	22:36 - 22:46 10 minutes	22˚C, 20%CC, No precipitation, Wind 2 from SE.	KTC, AMD
					June 21, 2011	21:02 - 21:12 10 minutes	25˚C, 80%CC, No precipitation, Wind 3 from SE. Thunder and lightning in the distance.	TAL, AMD
					June 22, 2011	23:13 - 23:23 10 minutes	18˚C, Light rain, Wind 1 from SW. Post-thunderstorm surveys: some lightning in the distance.	TAL, KTC
	BMA-014	534	n/a	Not Evaluated. Assumed Significant. Surveys to be completed in 2012.				

Appendix F

Ecological Land Classification (ELC) Abbreviations

Appendix F ELC Abbreviations

Cultural Thicket Communities

CUT1a:.....Sour Cherry Mineral Cultural Thicket Type
CUT1b:.....Nannyberry-Common Pear-Hawthorn Mineral Cultural Thicket Type
CUT1e:.....Sandbar Willow Mineral Cultural Thicket Type
CUT1f:.....White Elm-Buckthorn Mineral Cultural Thicket Type

Cultural Woodland Communities

CUW1a: .....Beech-Sugar Maple Mineral Cultural Woodland Type
CUW1f: .....Common buckthorn – Apple – Trembling Aspen Mineral Cultural Woodland Type
CUW1h: .....White Elm Mineral Cultural Woodland Type
CUW1o:.....White Pine – Scot's Pine – Black Walnut Cultural Woodland Type

Cultural Savannah Communities

CUS1a: .....White Pine-White Ash Mineral Cultural Savannah Type

Forest Communities

FOD4a: .....Dry-Fresh White ash-Beech Deciduous Forest Type
FOD7b: .....Fresh-Moist Basswood – Sugar Maple Lowland Deciduous Forest Type

Appendix G

Wildlife Species List

Appendix G. Wildlife Species List

AECOM

Type	COMMON NAME	SCIENTIFIC NAME	Global Status G Rank	Ontario Status S Rank	COSEWIC	SARA Status	SARA Schedule	COSSARO (SARA Status)2	Species at Risk - Provincial (a)	Provincially Rare (NHIC breeding season SRANK) (b)	PIF Priority Species. Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan	Area-sensitive - OMNR (c)	Significant in Region 6 (south-central)	Significant in Region 7 (south)	REGIOIN LEVEL	REGION HABITAT
Amphibian	Spotted Salamander	*Ambystoma maculatum*	G5	S4												
Amphibian	Eastern Red-backed Salamander	*Plethodon cinereus*	G5	S5												
Amphibian	Gray Treefrog (tetraploid species)	*Hyla versicolor*	G5	S5												
Amphibian	Spring Peeper	*Pseudacris crucifer*	G5	S5												
Amphibian	Green Frog	*Rana (Lithobates) clamitans*	G5	S5												
Amphibian	Wood Frog	*Rana (Lithobates) sylvatica*	G5	S5												
Brid	Canada Goose	*Branta canadensis*	G5	S5												
Bird	Mallard Duck	*Anas Platyhynchos*	G5	S5												
Bird	Turkey Vulture	*Cathartes aura*	G5	S5B											Level 3	Forest
Bird	Northern Harrier	*Circus cyaneus*	G5	S4B							√	A			Level 4	Marsh
Bird	Red-tailed Hawk	*Buteo jamaicensis*	G5	S5												
Bird	American Kestrel	*Falco sparverius*	G5	S4							√				Level 2	Open Country
Bird	Killdeer	*Charadrius vociferus*	G5	S5B,S5N												
Bird	American Woodcock	*Scolopax minor*	G5	S4B											Level 4	Forest
Bird	Mourning Dove	*Zenaida macroura*	G5	S5												
Bird	Great Horned Owl	*Bubo virginianus*	G5	S4												
Bird	Ruby-Throated Hummingbird	*Archilochus colubris*	G5	S5B											Level 3	Forest
Bird	Red-Bellied Woodpecker	*Melanerpes carolinus*	G5	S4											Level 2	Forest
Bird	Downey woodpecker	*Picoides pubescens*	G5	S5												
Bird	Hairy Woodpecker	*Picoides villosus*	G5	S5								A				
Bird	Northern Flicker	*Colaptes auratus*	G5	S4B							√					
Bird	Eastern Wood-Pewee	*Contopus virens*	G5	S4B							√					
Bird	Least Flycatcher	*Empidonax minimus*	G5	S4B								A			Level 3	Forest
Bird	Great Crested Flycatcher	*Myiarchus crinitus*	G5	S5B												
Bird	Eastern Kingbird	*Tyrannus tyrannus*	G5	S4B							√				Level 3	Open Country
Bird	Red-eyed Vireo	*Vireo olivaceus*	G5	S5B												
Bird	Blue-headed Vireo	*Vireo solitaries*	G5	S5B								A	Y	Y	Level 3	Forest
Bird	Blue jay	*Cyanocitta cristata*	G5	S5												
Bird	American Crow	*Corvus brachyrhynchos*	G5	S5B												
Bird	Horned Lark	*Eremophila alpestris*	G5	S4N											Level 3	Open Country
Bird	Barn Swallow	*Hirundo rustica*	G5	S4B											Level 3	Open Country
Bird	Tree Swallow	*Tachycineta bicolor*	G5	S4B												
Bird	Black-capped Chickadee	*Poecile atricapillus*	G5	S5											Level 4	Forest
Bird	White-breasted Nuthatch	*Sitta carolinensis*	G5	*S5*								A				
Bird	Red-breasted Nuthatch	*Sitta canadensis*	G5	S5								A			Level 3	Forest
Bird	House Wren	*Troglodytes aedon*	G5	S5B												
Bird	Wood Thrush	*Hylocichla mustelina*	G5	S4B							√				Level 4	Forest
Bird	American Robin	*Turdus migratorius*	G5	S5B												
Bird	Gray Catbird	*Dumetella carolinensis*	G5	S4B											Level 4	Forest
Bird	Cedar Waxwing	*Bombycilla cedrorum*	G5	S5B												
Bird	Yellow Warbler	*Dendroica petechia*	G5	S5B												
Bird	Magnolia Warbler	*Dendroica magnolia*	G5	S5B								A		Y	Level 1	Forest
Bird	Yellow-rumped Warbler	*Dendroica coronata*	G5	S5B										Y	Level 4	Forest
Bird	American Redstart	*Setophaga ruticilla*	G5	S5B								A			Level 2	Forest
Bird	Common Yellow Throat	*Geothlypis trichas*	G5	S5B												
Bird	Oven Bird	*Seiurus aurocapillus*	G5	S4B								A			Level 4	Forest
Bird	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	G5	S4B							√					
Bird	Indigo Bunting	*Passerina cyanea*	G5	S4B												
Bird	Northern Cardinal	*Cardinalis cardinalis*	G5	S5												
Bird	Field Sparrow	*Spizella pusilla*	G5	S4B							√				Level 3	Open Country
Bird	Vesper Sparrow	*Pooecetes gramineus*	G5	S4B							√				Level 2	Open Country
Bird	Grasshopper Sparrow	*Ammodramus Savannarum*	G5	S4B							√	A			Level 3	Open Country
Bird	Savannah Sparrow	*Passerculus sandwichensis*	G5	S4B							√	A			Level 1	Open Country
Bird	Song Sparrow	*Melospiza melodia*	G5	S5B												
Bird	Lincoln's Sparrow	*Melospiza lincolnii*	G5	S5B									Y	Y		
Bird	White Throated Sparrow	*Zonotrichia albicollis*	G5	S5B											Level 2	Forest
Bird	Dark-eyed Junco	*Junco hyemalis*	G5	S5B									Y	Y		
Bird	Baltimore Oriole/ Northern Oriole	*Icterus galbula*	G5	S4B							√					
Bird	Red-Winged Blackbird	*Agelaius phoeniceus*	G5	S4												
Bird	Brown-headed cowbird	*Molothrus ater*	G5	S4B												
Bird	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	G5	S4B							√					
Bird	American Goldfinch	*Cardeulis tristis*	G5	S5B											Level 3	Open Country
Butterfly	American/Bronze Copper	*Lycaena phlaeas/hyllus*	G5	S5												
Butterfly	Cabbage White	*Pieris rapae*	G5	SNA												
Butterfly	Common Sulphur AKA Clouded Sulpher	*Colias philodice*	G5	S5												
Butterfly	Eastern Comma	*Polygonia comma*	G5	S5												
Butterfly	Monarch	*Danaus plexippus*	G5	S2N,S4B	SC	SC	Schedule 1	SC								
Butterfly	Pearl Crescent	*Phyciodes tharos*	G5	S4												
Crayfish	Chimney Crayfish AKA Digger Crayfish	*Fallicambarus fodiens*	G5	S4												
Insect	Annual Cicada	*Tibicen pruinosa*	no data available	no data available												
Insect	Canada Darner	*Aeshna canadensis*	G5	S5												
Insect	Carolina Grasshopper	*Dissosteira carolina*	no data available	no data available												
Insect	Common Green Darner	*Anax junius*	G5	S5												
Mammal	Coyote	*Canis latrans*	G5	S5												
Mammal	Black Bear	*Ursus americanus*	G5	S5	NAR			NAR								
Mammal	Racoon	*Procyon lotor*	G5	S5												
Mammal	Eastern Chipmunk	*Tamias striatus*	G5	S5												
Mammal	Least Chipmunk	*Tamias minimus*	G5	S5												
Mammal	Grey Squirrel	*Sciurus carolinensis*	G5	S5												
Mammal	Red Squirrel	*Tamiasciurus hudsonicus*	G5	S5												
Mammal	White-tailed Deer	*Odocoileus virginianus*	G5	S5												
Mammal	Meadow Vole	*Microtus pennsylvanicus*	G5	S5												
Reptile	Snapping turtle	*Chelydra serpentina*	G5	S3												
Reptile	Garter snake	*Thamnophis sirtalis sirtalis*	G5T5	S5												
Skipper	Silver-spotted-Skipper	*Epergyreus clarus*	G5	S4												

LEGEND

[a] *National Species at Risk are those listed by COSEWIC = Committee on the Status of Endangered Wildlife in Canada*
[b] *SRANK (from Natural Heritage Information Centre) shown for breeding status if: S1 (Critically Imperiled, often < 5 occurrences).*
c Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.

Appendix H

Vascular Plant Species List

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW1497/1521/ 1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085	483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450		456	459	460		462	463			470	475	480									481	483	484		487	488	490	492	494	493/ 496	495	498	501		504		506	508
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUM1f	SWT2-10	FOD5-1	CUP3-2	FOD4&7 / SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2	CUM1-1	FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUM1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3	SWD2-2	CUP3-2	FOD5-2	CUT1b	CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2	CUM1-1	SWT2-2	FOD5-2	CUP3-2	CUP1-3	MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
PTERIDOPHYTES		**FERNS & ALLIES**																																																								
Dryopteridaceae		**Wood Fern Family**																																																							
Athyrium	*filix-femina var. angustum*	Northern Lady Fern	4	0		S5			G5T5	X																		√																												√			
Dryopteris	*carthusiana*	Spinulose Wood Fern	5	-2		S5			G5	X																	√																		√	√												√
Dryopteris	*intermedia*	Evergreen Wood Fern	5	0		S5			G5	X																		√																														
Dryopteris	*marginalis*	Marginal Wood Fern	5	3		S5			G5	X																																																	
Matteuccia	*struthiopteris*	Ostrich Fern	5	-3		S5			G5	X																																																
Onoclea	*sensibilis*	Sensitive Fern	4	-3		S5			G5	X																		√																													√			√
Polystichum	*acrostichoides*	Christmas Fern	5	5		S5			G5	X																																																	
Equisetaceae		**Horsetail Family**																																																							
Equisetum	*arvense*	Field Horsetail	0	0		S5			G5	X				√																																													
Equisetum	*hyemale var. affine*	Scouring-rush	2	-2		S5			G5T5	X																																																
Equisetum	*pratense*	Meadow Horsetail	8	-3		S5			G5	X																√									√																							
Equisetum	*species*	Horestail species																																																							
Equisetum	*sylvaticum*	Wood Horsetail	7	-3		S5			G5	X																																															
Thelypteridaceae		**Marsh Fern Family**																																																						
Thelypteris	*noveboracensis*	New York Fern	7	-1		S4S5			G5	X																		√																													
GYMNOSPERMS		**CONIFERS**																																																						
Pinaceae		**Pine Family**																																																						
Larix	*laricina*	Tamarack	7	-3		S5			G5	X																																																
Picea	*abies*	Norway Spruce		5	-1	SE3			G?							√																																									
Picea	*glauca*	White Spruce	6	3		S5			G5	X																																															
Picea	*pungens*	Colorado Spruce				SE1			G5																																															
Pinus	*nigra*	Austrian Pine		-5	-1	SE2			G?																																															
Pinus	*resinosa*	Red Pine	8	3		S5			G5	I																				√																												
Pinus	*strobus*	Eastern White Pine	4	3		S5			G5	X				√				√																							√	√			√											√			
Pinus	*sylvestris*	Scotch Pine		5	-3	SE5			G?	I				√																																											
Tsuga	*canadensis*	Eastern Hemlock	7	3		S5			G5	X													√																																		√		
Cupressaceae		**Cedar Family**																																																					
Juniperus	*virginiana*	Eastern Red Cedar	4	3		S5			G5	X						√																																√									
Thuja	*occidentalis*	Eastern White Cedar	4	-3		S5			G5	X						√					√			√										√		√												√									
DICOTYLEDONS		**DICOTS**																																																				
Aceraceae		**Maple Family**																																																					
Acer	*rubrum*	Red Maple	4	0		S5			G5	X				√																															√											
Acer	*saccharinum*	Silver Maple	5	-3		S5			G5	X	√					√						√																							√	√										
Acer	*saccharum*	Sugar Maple	4	3		S5			G5T?	X					√		√			√		√		√	√	√	√	√	√		√		√					√	>			√		√		√				√	√				√	√		√
Acer	*negundo*	Manitoba Maple	0	-2		S5			G5					√		√														√	√																								
Acer	*nigrum*	Black Maple	7	3		S4?			G5Q	X																																															
Acer X	*freemanii*	Freeman's Maple				S5							√	√														√																√											
Amaranthaceae		**Amaranth Family**																																																				
Amaranthus	*retroflexus*	Green Amaranth		2	-1	SE5			G?	I																																													
Anacardiaceae		**Sumac or Cashew Family**																																																			
Rhus	*hirta*	Staghorn Sumac	1	5		S5			G5	X						√						√							√											√														
Toxicodendron	*radicans ssp. negundo*	Poison-ivy	5	-1		S5			G5T	X		√		√						√		√		√	√	√		√	√		√		√						√			√	√		√	√		√					√				√	√		√
Annonaceae		**Custard-apple Family**																																																				
Cryptotaenia	*canadensis*	Honewort	5	0		S5			G5	X																																												
Apiaceae		**Carrot or Parsley Family**																																																			
Daucus	*carota*	Wild Carrot		5	-2	SE5			G?	I					√	√					√	√		√						√		√		√			√	√	√	√			√		√								
Pastinaca	*sativa*	Wild Parsnip		5	-3	SE5			G?																																														
Apocynaceae		**Dogbane Family**																																																				
Apocynum	*cannabinum*	Indian Hemp		1		S5			G5T	X			√	√												√																													
Apocynum	*Species*	Hemp species																																																					
Aristolochiaceae		**Duchman's-pipe Family**																																																			
Asarum	*canadense*	Wild Ginger	6	5		S5			G5	X												√			√				√														√										√		
Asclepiadaceae		**Milkweed Family**																																																			
Asclepias	*incarnata ssp. incarnata*	Swamp Milkweed	6	-5		S5			G5T5	X																																												
Asclepias	*syriaca*	Common Milkweed	0	5		S5			G5	X																				√				√	√	√												√									
Asteraceae		**Composite or Aster Family**																																																			
Achillea	*millefolium var. millefolium*	Common Yarrow		3	-1	SE?			G5T?					√																																								
Ageratina	*altissima var. altissima*	White Snakeroot	5	3		S5			G5																																														
Ambrosia	*artemisiifolia*	Common Ragweed	0	3		S5			G5	X				√																								√	√															
Arctium	*minus*	Common Burdock		5	-2	SE5			G?T?	I		√		√	√		√					√			√			√			√						√	√												√			√		
Bidens	*cernua*	Stick-tight	2	-5		S5			G5																			√																											
Bidens	*frondosa*	Devil's Beggar-ticks	3	-3		S5			G5	X																			√						√																		√		
Centaurea	*jacea*	Brown Knapweed		5	-1	SE5			G?	I																																													
Cichorium	*intybus*	Chicory		5	-1	SE5			G?	I																				√						√																			
Cirsium	*arvense*	Canada Thistle		3	-1	SE5			G?	I																		√			√				√		√	√	√	√															

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW1497/1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085	483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450		456	459	460		462	463			470	475	480									481	483	484		487	488	490	492	494	493/ 496	495	498	501		504		506	508
				Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUW1f	SWT2-10	FOD5-1	CUP3-2	FOD4&7 / SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2	CUM1-1	FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUW1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3	SWD2-2	CUP3-2	FOD5-2	CUT1b	CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2	CUM1-1	FOD5-2	CUP3-2	CUP1-3 MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
Cirsium	*vulgare*	Bull Thistle		4	-1	SE5			G5	I																																															
Conyza	*canadensis*	Horseweed	0	1		S5			G5	X																																															
Erigeron	*annus*	Eastern Daisy Fleabane	0	1		S5			G5																																														
Erigeron	*philadelphicus ssp. philadelphicus*	Philadelphia Fleabane	1	-3		S5			G5T?	X																																													
Erigeron	*strigosus*	Prairie Fleabane	1			S5			G5	X				√																																										
Eupatorium	*perfoliatum*	Perfoliate Thoroughwort/Boneset	2	-4		S5			G5	X																																													
Eupatorium	*maculatum*	Spotted Joe-pye-weed	3	-5		S5			G5T5	X																																													
Eurybia	*macrophylla*	Large-leaved Aster	5	5		S5			G5	X																																													
Euthamia	*graminifolia*	Flat-topped Bushy Goldenrod	2	-2		S5			G5	X																		√				√																							
Hieracium	*caespitosum*	Field Hawkweed		5	-2	SE5				I																																													
Inula	*helenium*	Elecampane		5	-2	SE5			G?	I																																													
Lactuca	*Species*	Lettuce species													√																																							
Lactuca	*biennis*	Biennial Lettuce	6	0		S5			G5	X																																													
Lactuca	*serriola*	Prickly Lettuce		0	-1	SE5			G?																																														
Leucanthemum	*vulgare*	Ox-eye Daisy		5	-1	SE5			G?																																														
Packera	*paupercula*	Balsam Groundsel	7	-1		S5			G5	X																																													
Prenanthes	*alba*	White Rattlesnake-root	6	3		S5			G5	X																																												
Prenanthes	*altissima*	White lettuce	5	3		S5			G5?	X																																												
Rudbeckia	*hirta*	Black-eyed Susan	0	3		S5			G5	X																																												
Solidago	*altissima*	Tall Goldenrod	1	3		S5				X	√	√	√	√		√				√		√				√				√		√	√		√		√	√									√		√	√		√		√	
Solidago	*caesia*	Blue-stemmed Goldenrod	5	3		S5			G5	X																																											
Solidago	*canadensis*	Canada Goldenrod	1	3		S5			G5	X																																											
Solidago	*flexicaulis*	Zig-zag Goldenrod	6	3		S5			G5	X							√				√			√	√		√			√																							√		√
Solidago	*gigantea*	Giant Goldenrod	4	-3		S5			G5	X				√												√																												
Solidago	*juncea*	Early Goldenrod	3	5		S5			G5	X																																												
Solidago	*species*	Goldenrod species													√	√														√																							
Solidago	*nemoralis ssp. nemoralis*	Gray Goldenrod	2	5		S5			G5T?	X																																											
Sonchus	*arvensis ssp. arvensis*	Field Sow-thistle				SE5			G?T?	I																											√																
Symphyotrichum	*species*	Aster species									√						√				√			√				√										√															
Symphyotrichum	*cordifolium*	Heart-leaved Aster	5	5		S5			G5	X																																											√
Symphyotrichum	*ericoides*	White Heath Aster	4	4		S5			G5T?	X																																											
Symphyotrichum	*lateriflorum*	Calico Aster	3	-2		S5			G5T5													√		√		√		√	√	√								√	√	√		√		√						√		√		
Symphyotrichum	*lanceolatum*	Tall White Aster	3	-3		S5			G5T?	X		√		√		√				√	√	√		√		√	√	√		√	√	√				√	√	√		√	√	√						√		√		
Symphyotrichum	*novae-angliae*	New England Aster	2	-3		S5			G5	X		√		√		√						√				√				√		√	√	√			√												√				
Symphyotrichum	*pilosus*	Hairy Aster	4	2		S5			G5T?	X												√																													√				
Symphyotrichum	*puniceum*	Purple-stemmed Aster				S5			G5T?	X																				√				√																	√			
Tanacetum	*vulgare*	Common Tansy		5	-1	SE5			G?																																													
Taraxacum	*officinale*	Common Dandelion		3	-2	SE5			G5	I				√						√									√								√	√	√				√	√				√		√			√
Tussilago	*farfara*	Coltsfoot		3	-2	SE5			G?	I																				√																							
Xanthium	*spinosum*	Spiny Cocklebur		3	-1	SE2?			G?												√			√																													
Balsaminaceae		**Touch-me-not Family**																																																				
Impatiens	*capensis*	Spotted Touch-me-not	4	-3		S5			G5	X				√												√	√	√		√		√			√	√	√		√						√		√			√			
Berberidaceae		**Barberry Family**																																																			
Caulophyllum	*thalictroides*	Blue Cohosh	6	5		S5			G	X																√				√				√		√												√		√		√
Podophyllum	*peltatum*	May-apple	5	3		S5			G5	X																										√														√		√		√
Betulaceae		**Birch Family**																																																			
Betula	*alleghaniensis*	Yellow Birch	6	0		S5			G5	X						√		√				√			√																													
Betula	*papyrifera*	White Birch		2		S5			G5	X													√																											√				
Carpinus	*caroliniana*	Blue Beech	6	0		S5			G5T	X														√						√																							
Ostrya	*virginiana*	Hop Hornbeam - Ironwood	4	4		S5			G5	X								√						√	√										√																√		√
Boraginaceae		**Borage Family**																																																			
Echium	*vulgare*	Blueweed/common vipersbugloss		5	-2	SE5			G?	I																																											
Lithospermum	*officinale*	Common Gromwell		5	-1	SE5			G?	I				√																																								
Brassicaceae		**Mustard Family**																																																			
Alliaria	*petiolata*	Garlic Mustard		0	-3	SE5			G5	I				√						√						√	√	√		√					√						√			√	√		√					√		√
Barbarea	*vulgaris*	Yellow Rocket		0	-1	SE5			G?	I																																											
Cardamine	*bulbosa*	Bulbous Cress	8	-5		S4			G5	X																																											
Cardamine	*concatenata*	Cut-leaved Toothwort	6	3		S5			G5	X																																										
Cardamine	*diphylla*	Broad-leaf Toothwort	7	5		S5				X																																										
Cardamine	*pensylvanica*	Pensylvania Bitter-cress	6	-4		S5			G5																																											
Hesperis	*matronalis*	Dame's Rocket		5	-3	SE5			G4G5	I																																											
Rorippa	*nasturtium-aquaticum*	Water-cress		-5	-1	SE?			G?	I																																											
Caprifoliaceae		**Honeysuckle Family**																																																			
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SE5			G?	I		√		√									√															√															
Sambucus	*canadensis*	Common Elderberry	5	-2		S5			G5	X				√	√							√			√								√	√			√															
Sambucus	*racemosa var. racemosa*	Red-berried Elderberry	5	2		S5			G5T4T5	X																													√															√
Sambucus	*species*	Elderberry species																																																		

Appendix H. Plant Species List

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW1497/1521/ 1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085		483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450		456	459	460		462	463			470	475	480											481	483		484		487		488	490	492	494	493/ 496	495	498	501		504		506		508
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUW1f	SWT2-10	FOD5-1	CUP3-2	FOD4a / SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2 CUM1-1 FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUW1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3 SWD2-2	CUP3-2	FOD5-2	CUT1b CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2 CUM1-1	SWT2-2	FOD5-2	CUP3-2	CUP1-3 MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
Triosteum	*aurantiacum*	Wild Coffee	7	5		S5			G5	X																																																			
Viburnum	*acerifolium*	Maple-leaved Viburnum	6	5		S5			G5	X																																																			
Viburnum	*lentago*	Nannyberry	4	-1		S5			G5	X				√			√			√		√	√					√																				√													
Viburnum	*opulus*	highbush cranberry	5	-3		S5			G5T5	X																																																			
Caryophyllaceae		**Pink Family**																																																											
Dianthus	*armeria*	Deptford Pink		5	-1	SE5			G?	I																																																			
Saponaria	*officinalis*	Bouncing-bet		3	-3	SE5			G?	I																																																			
Stellaria	*media*	Common Chickweed		3	-1	SE5			G?	I																																																			
Celastraceae		**Staff-tree Family**																																																											
Euonymus	*obovata*	Running Strawberry-bush	6	5		S5			G5	X													√			√		√	√																																
Convolvulaceae		**Morning-glory Family**																																																											
Convolvulus	*arvensis*	Field Bindweed		5	-1	SE5			G?	I																													√	√						√		√													
Cornaceae		**Dogwood Family**																																																											
Cornus	*alternifolia*	Alternate-leaved Dogwood	6	5		S5			G5	X											√			√								√									√													√							√
Cornus	*racemosa*	Red Panicled Dogwood/Gray dogwood	2	-2		S5			G5?	X			√	√						√																												√													
Cornus	*rugosa*	Round-leaved Dogwood	6	5		S5			G5	X																																																			
Cornus	*amomum*	Silky Dogwood	5	-4		S5			G5T?	X						√	√																																												
Cornus	*sericea*	Red-osier Dogwood	2	-3		S5			G5	X				√		√	√					√			√			√			√	√	√	√	√			√	√							√		√					√						√		
Cucurbitaceae		**Gourd Family**																																																											
Echinocystis	*lobata*	Prickly Cucumber	3	-2		S5			G5	X																																																			
Dipsacaceae		**Teasel Family**																																																											
Dipsacus	*fullonum ssp. sylvestris*	Wild Teasel		5	-1	SE5			G?T?	I																		√			√		√	√					√					√				√								√					
Elaeagnaceae		**Oleaster Family**																																																											
Elaeagnus	*angustifolia*	Russian Olive		4	-1	SE3			G?	X																							√		√																										
Euphorbiaceae		**Spurge Family**																																																											
Acalypha	*rhomboidea*	Three-seeded Mercury	0	3		S5			G5T5																																																				
Fabaceae		**Pea Family**																																																											
Coronilla	*varia*	Variable Crown-vetch		5	-2	SE5			G?																																											√									
Gleditsia	*triacanthos*	Honey Locust	3	0		S2			G5							√																																													
Lotus	*corniculatus*	Bird's-foot Trefoil		1	-2	SE5			G?	I																											√									√		√													
Medicago	*lupulina*	Black Medick		1	-1	SE5			G?	I																				√																√		√													
Medicago	*sativa ssp. sativa*	Alfalfa		5	-1	SE5			G?T?	I																																				√															
Melilotus	*alba*	White Sweet-clover		3	-3	SE5			G?	I																																																			
Melilotus	*officinalis*	Yellow Sweet-clover		3	-1	SE5			G?	I																													√																						
Robinia	*pseudo-acacia*	Black Locust		4	-3	SE5			G5	I																																																			
Trifolium	*hybridum ssp. elegans*	Alsike Clover		1	-1	SE5				I																							√					√																							
Trifolium	*pratense*	Red Clover		2	-2	SE5			G?	I																												√	√									√													
Trifolium	*repens*	White Clover		2	-1	SE5			G?	I																																																			
Vicia	*cracca*	Tufted Vetch		5	-1	SE5			G?	I																							√						√	√																					
Vicia	*tetrasperma*	Slender Vetch		5	-1	SE5			G?																																																				
Fagaceae		**Beech Family**																																																											
Fagus	*grandifolia*	American Beech	6	3		S5			G5	X															√	√	√		√			√				√					√		√							√				√				√			√
Quercus	*alba*	White Oak	6	3		S5			G5																																																				
Quercus	*macrocarpa*	Bur Oak	5	1		S5			G5	X													√						√													√		√																	
Quercus	*rubra*	Red Oak	6	3		S5			G5	X																													√																						
Quercus	*species*	Oak species																																									√																		
Fumariaceae		**Fumitory Family**																																																											
Dicentra	*canadensis*	Squirrel-corn	7	5		S5			G5	X																																																			
Dicentra	*cucullaria*	Dutchman's-breeches	6	5		S5			G5	X																																																			
Geraniaceae		**Geranium Family**																																																											
Geranium	*maculatum*	Spotted Crane's-bill	6	3		S5			G5	X																√																															√			
Geranium	*robertianum*	Herb-robert		5	-2	SE5			G5	I				√				√					√		√		√	√	√			√						√			√	√					√							√							
Grossulariaceae		**Currant Family**																																																											
Ribes	*americanum*	Wild Black Currant	4	-3		S5			G5	X				√														√																				√											√		
Ribes	*cynosbati*	Prickly Gooseberry	4	5		S5			G5	X																		√	√			√																						√							√
Ribes	*lacustre*	Swamp Black Currant	7	-3		S5			G5																				√																																
Ribes	*rubrum*	Red Currant		5	-2	SE5			G4G5																																																				
Ribes	*triste*	Wild Red Currant	6	-5		S5			G5	X																√										√																									
Ribes	*species*	Currant species													√	√					√			√																																					
Guttiferae		**St. John's-wort Family**																																																											
Hypericum	*perforatum*	Common St. John's-wort		5	-3	SE5			G?	I																									√											√		√	√								√				√
Hamamelidaceae		**Witch-hazel Family**																																																											
Hamamelis	*virginiana*	Witch-hazel	6	3		S5			G5	X																																																			
Hydrophyllaceae		**Water-leaf Family**																																																											
Hydrophyllum	*virginianum*	Virginia Water-leaf	6	-2		S5			G5	X																						√						√																√							√
Hippocastanaceae		**Buckeye Family**																																																											
Aesculus	*hippocastanum*	Horse Chestnut		5	-1	SE2			G?	I																																																			

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW14971/1521/ 1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085	483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450		456	459	460		462	463			470	475	480											481	483	484		487	488	490	492	494	493/ 496	495	498	501		504		506	508
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUW1f	SWT2-10	FOD5-1	CUP3-2	FOD4&7	SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2	CUM1-1	FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUW1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3	SWD2-2	CUP3-2	FOD5-2	CUT1b	CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2	CUM1-1	SWT2-2	FOD5-2	CUP3-2	CUP1-3	MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
Iridaceae		**Iris Family**																																																											
Iris	*versicolor*	Multi-coloured Blue-flag	5	-5		S5			G5					√																														√			√																
Juglandaceae		**Walnut Family**																																																										
Carya	*cordiformis*	Bitternut hickory	6	0		S5			G5	X					√													√															√	√					√											
Carya	*ovata*	Shagbark Hickory	6	3		S5			G5																	√			√																														
Juglans	*cinerea*	Butternut	6	2		S3?			G4	X																																																				
Juglans	*nigra*	Black Walnut	5	3		S4			G5	X	√			√							√			√							√							√	√					√												√				√				
Lamiaceae		**Mint Family**																																																											
Clinopodium	*vulgaris*	Wild basil	4	5		S5				X																																																				√
Lamium	*purpureum*	Purple Dead-nettle		5	-2	SE3			G?																																																				
Leonurus	*cardiaca ssp. cardiaca*	Common Motherwort		5	-2	SE5			G?T?	I																																																			√
Lycopus	*americanus*	Cut-leaved Water-horehound	4	-5		S5			G5	X																																																			
Lycopus	*uniflorus*	Northern Water-horehound	5	-5		S5			G5	X																																																		
Mentha	*arvensis*	American Wild Mint	3	-3		S5				X					√																																													
Nepeta	*cataria*	Catnip		1	-2	SE5			G?	I																																																		
Origanum	*vulgare*	Wild Marjarom		5	-2	SE5			G?	I																																																	
Prunella	*vulgaris*	Heal-all		0	-1	SE3			G5T?	X				√						√																																							
Scutellaria	*galericulata*	Hooded Skullcap	6	-5		S5			G5	X																																																	
Lauraceae		**Laurel Family**																																																										
Lindera	*benzoin*	Spicebush	6	-2		S5			G5	X											√		√	√																																			
Malvaceae		**Mallow Family**																																																										
Malva	*moschata*	Musk Mallow		5	-1	SE5			G?	I																																																		
Malva	*neglecta*	Cheeses		5	-1	SE5			G?	I																																																		
Menispermaceae		**Moonseed Family**																																																									
Menispermum	*canadense*	Moonseed	7	0		S4			G5	X																																																		
Moraceae		**Mulberry Family**																																																									
Morus	*alba*	White Mulberry		0	-3	SE5			G?																																																			
Nymphaeaceae		**Water-lily Family**																																																									
Nuphar	*species*	Pond-lily species																																																									
Oleaceae		**Olive Family**																																																									
Fraxinus	*americana*	White Ash	4	3		S5			G5	X		√		√				√		√	√		√	√	√	√	√						√	√								√		√			√				√	√						√	√	√	√	√		√
Fraxinus	*nigra*	Black Ash	7	-4		S5			G5	X																																		√		√							√											
Fraxinus	*pennsylvanica*	Green ash	3	-3		S5			G5	X		√	√	√		√				√	√			√				√																√	√					√											
Fraxinus	*species*	Ash species									√																		√																														
Syringa	*vulgaris*	Common Lilac		5	-2	SE5			G?	I						√																																												√
Onagraceae		**Evening-primrose Family**																																																									
Circaea	*lutetiana*	Enchanter's Nightshade	3	3		S5			G5T5					√	√			√		√					√	√		√	√			√									√							√	√										
Epilobium	*ciliatum ssp. ciliatum*	Ciliate Willow-herb	3	3		S5			G5T?	X																										√																						√		
Epilobium	*coloratum*	Purple-veined Willow-herb	3	-5		S5			G5	X																																																		
Epilobium	*hirsutum*	Great Hairy Willow-herb		-4	-2	SE5			G?	I																																																	
Epilobium	*leptophyllum*	Narrow-leaved Willow-herb	7	-5		S5			G5	X																																																	
Epilobium	*species*	Willow-herb speices																																																							√		
Oenothera	*biennis*	Common Evening-primrose	0	3		S5			G5	X																																																
Orobanchaceae		**Broom-rape Family**																																																								
Epifagus	*virginiana*	Beech-drops	6	5		S5			G5	X																			√																													
Oxalidaceae		**Wood Sorrel Family**																																																								
Oxalis	*stricta*	Upright Yellow Wood-sorrel	0	3		S5			G5	X																																																	
Papaveraceae		**Poppy Family**																																																								
Chelidonium	*majus*	Celandine		5	-3	SE5			G?																																																			
Sanguinaria	*canadensis*	Bloodroot	5	4		S5			G5	X																			√					√																						√		
Plantaginaceae		**Plantain Family**																																																							
Plantago	*lanceolata*	Ribgrass		0	-1	SE5			G5	I																																																
Plantago	*major*	Common Plantain		-1	-1	SE5			G5	I																																																
Plantago	*rugelii*	Rugel's Plantain	1	0		S5			G5	X				√																																													
Polygonaceae		**Smartweed Family**																																																							
Polygonum	*lapathifolium*	Pale Smartweed	2	-4		S5			G5	X																																															
Polygonum	*cuspidatum*	Japanese Knotweed		3	-1	SE4			G?																																															
Polygonum	*hydropiper*	Water-pepper	4	-5		SE5			G5	I																		√																													
Polygonum	*persicaria*	Lady's-thumb		-3	-1	SE5			G?	I																																															
Rumex	*crispus*	Curly-leaf Dock		-1	-2	SE5			G?	I					√						√																		√	√	√																√
Rumex	*obtusifolius*	Bitter Dock		-3	-1	SE5			G5	I																																															
Rumex	*orbiculatus*	Great Water Dock	6	-5		S4S5			G5	X																																															
Primulaceae		**Primrose Family**																																																							
Lysimachia	*ciliata*	Fringed Loosestrife	4	-3		S5			G5	X																																														
Lysimachia	*nummularia*	Moneywort		-4	-3	SE5			G?	I																																														
Lysimachia	*thyrsiflora*	Tufted Loosestrife	7	-5		S5			G5	X				√																																										

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW1497/1521/ 1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085	483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450		456	459	460		462	463			470	475	480									481	483	484			487	488	490	492	494	493/ 496	495	498	501		504		506	508
				Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUW1f	SWT2-10	FOD5-1	CUP3-2	FOD4&7	SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2	CUM1-1	FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUW1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3	SWD2-2	CUP3-2	FOD5-2	CUT1b	CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2	CUM1-1	FOD5-2	CUP3-2	CUP1-3	MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
Ranunculaceae		**Buttercup Family**																																																							
Actaea	*pachypoda*	White Baneberry	6	5		S5			G5	X																		√		√																													
Actaea	*rubra*	Red Baneberry	5	5		S5				X																																																
Actaea	*species*	Baneberry species																																																						
Anemone	*canadensis*	Canada Anemone	3	-3		S5			G5	X								√				√																																				
Anemone	*virginiana*	Thimbleweed	4	5		S5			G5T	X																																															
Caltha	*palustris*	Marsh-marigold	5	-5		S5			G5	X																																															
Clematis	*virginiana*	Virgin's-bower	3	0		S5			G5	X																																														
Ranunculus	*abortivus*	Kidney-leaf Buttercup	2	-2		S5			G5	X																																														√
Ranunculus	*acris*	Tall Buttercup			-2	SE5			G5	I																√																												
Ranunculus	*hispidus var. nitidus*	Swamp Buttercup				SR			G5T5	X																																												
Ranunculus	*pensylvanicus*	Bristly Buttercup	3	-5		S5			G5	X																																												
Ranunculus	*recurvatus var. recurvatus*	Hooked Buttercup	4	-3		S5			G5	X																																												
Ranunculus	*sceleratus*	Cursed Buttercup	2	-5		S5			G5T5	X																																												
Ranunculus	*species*	Buttercup species																																																					
Thalictrum	*dioicum*	Early Meadow-rue	5	2		S5			G5	X																			√																										√
Rhamnaceae		**Buckthorn Family**																																																				
Rhamnus	*cathartica*	Common Buckthorn		3	-3	SE5			G?	I	√	√		√		√				√	√	√	√	√		√			√	√			√	√			√	√			√	√	√	√			√	√			√			√			√
Rosaceae		**Rose Family**																																																				
Agrimonia	*gryposepala*	Tall Hairy Agrimony	2	2		S5			G5	X				√																						√					√	√				√			√								√
Amelanchier	*arborea*	Downy Juneberry		3		S5			G5	X																																															√
Amelanchier	*laevis*	Smooth Juneberry	5	5		S5			G4G5C	X				√						√																																				
Amelanchier	*species*	Juneberry species																																																					
Crataegus	*chrysocarpa*	Round-leaved Hawthorn	4	5		S5			G5	X																																													
Crataegus	*macracantha*	Large-thorned Hawthorn	4	5		S5														√																																			
Crataegus	*macrosperma*	Variable Thorn	4	5		S5			G5																												√																		
Crataegus	*mollis*	Downy Thorn	4	-2		S5			G5	X													√																																
Crataegus	*monogyna*	English Hawthorn		5	-1	SE5			G5	I					√							√	√			√																				√								
Crataegus	*punctata*	Large-fruited Thorn	4	5		S5			G5	X																√																				√								
Crataegus	*species*	Hawthorn species												√																					√		√		√			√	√				√						√			
Fragaria	*vesca ssp. americana*	Woodland Strawberry	4	4		S5			G5T?	X																									√												√								
Fragaria	*virginiana*	Virginia Strawberry	2	1		SU			G5T?	X		√		√	√					√		√			√	√									√	√	√	√			√	√				√	√							√
Geum	*aleppicum*	Yellow Avens	2	-1		S5			G5	X				√																					√							√	√	√				√							
Geum	*canadense*	White Avens	3	0		S5			G5	X		√		√											√	√	√									√	√					√		√	√							√			√
Geum	*urbanum*	Wood Avens		5	-1	SE2			G5																																														
Geum	*species*	Avens species																			√		√	√	√				√																									
Malus	*pumila*	Common apple		5	-1	SE5			G5	I		√		√		√						√	√			√		√						√	√			√	√	√				√		√						√		
Potentilla	*recta*	Rough-fruited Cinquefoil		5	-2	SE5			G?	I																																													
Potentilla	*norvegica ssp. norvegica*	Cinquefoil				SU			G5T?	X																																												
Prunus	*avium*	Sweet Cherry		5	-2	SE4			G?	I										√																√																		
Prunus	*cerasus*	Sour Cherry		5	-1	SE1			G?																	√	√		√						√		√	√				√												
Prunus	*nigra*	Canada Plum	4	4		S4			G4G5	X																																													
Prunus	*pensylvanica*	Pin Cherry	3	4		S5			G5	X																		√																										√
Prunus	*serotina*	Black Cherry	3	3		S5			G5	X							√			√					√	√			√				√													√		√					√
Prunus	*species*	Cherry Species									√																			√																							
Prunus	*virginiana ssp. virginiana*	Choke Cherry	2	1		S5			G5T?	X		√		√			√			√	√		√	√		√			√				√			√	√	√	√			√	√				√	√			√	√		√
Pyrus	*communis*	Common Pear		5	-1	SE4			G5	I					√																																							
Pyrus	*species*	Pear species																																																				
Rosa	*acicularis ssp. sayi*	Prickly Rose	7	3		S5			G5TU	X																																												
Rosa	*multiflora*	Multiflora Rose		3	-3	SE4			G?	I																										√																		
Rubus	*allegheniensis*	Alleghany Blackberry	2	2		S5			G5	X																		√																										√
Rubus	*idaeus*	Red Raspberry				SE1			G5T5		√	√	√	√	√		√			√					√	√	√	√	√	√		√						√	√			√	√								√
Rubus	*occidentalis*	Black raspberry	2	5		S5			G5	X				√						√		√				√		√						√	√			√														√
Rubus	*pubescens*	Dwarf Raspberry	4	-4		S5			G5	X				√																																								
Sorbus	*aucuparia*	European Mountain-ash		5	-2	SE4			G5	I																																												
Waldsteinia	*fragarioides*	Barren Strawberry	5	5		S5			G5	X																																												
Rubiaceae		**Madder Family**																																																				
Galium	*asprellum*	Rough Bedstraw	6	-5		S5			G5	X																																												√
Galium	*mollugo*	White Bedstraw		5	-2	SE5			G?	I																																												
Galium	*triflorum*	Sweet-scented Bedstraw	4	2		S5			G5	X																																										√		
Rutaceae		**Rue Family**																																																			
Zanthoxylum	*americanum*	American Prickly-ash	3	5		S5			G5	X																																												
Salicaceae		**Willow Family**																																																			
Populus	*balsamifera ssp. balsamifera*	Balsam Poplar	4	-3		S5			G5T?	X				√																										√													
Populus	*alba*	Silver Poplar		5	-3	SE5			G5	I																																												
Populus	*deltoides ssp. deltoides*	Eastern Cottonwood	4	-1		SU			G5T?	X	√				√																											√												
Populus	*grandidentata*	Large-tooth Aspen	5	3		S5			G5	X																																											

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW1497/1521/ 1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085	483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450		456	459	460		462	463			470	475	480									481	483	484		487	488	490	492	494	493/ 496	495	498	501		504		506	508
			≥	Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUM1f	SWT2-10	FOD5-1	CUP3-2	FOD4&7 / SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2	CUM1-1	FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUM1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3	SWD2-2	CUP3-2	FOD5-2	CUT1b	CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2 CUM1-1	SWT2-2	FOD5-2	CUP3-2	CUP1-3 MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
Populus	*tremuloides*	Trembling Aspen		0		S5			G5	X	√			√																						√										√											
Populus X	*canadensis*	Carolina Poplar				SE1			HYB	I																√																															
Salix	*alba*	White Willow			-2	SE4			G5	I					√																																									
Salix	*amygdaloides*	Peach-leaved Willow	6	-3		S5			G5	X										√								√				√																			√					
Salix	*bebbiana*	Long-beaked Willow	4	-4		S5			G5	X																				√				√																			√	√			
Salix	*discolor*	Pussy Willow	3	-3		S5			G5	X																												√																√	√			
Salix	*eriocephala*	Missouri Willow	4	-3		S5			G5	X				√												√																												√	√			
Salix	*exigua*	Sandbar Willow	3	-5		S5			G5	X																						√					√	√	√																				
Salix	*lucida*	Shining Willow	5	-4		S5			G5	X																								√																									
Salix	*petiolaris*	Slender Willow	3	-4		S5			G4	X																																																
Salix	*fragilis*	Crack Willow		-1	-3	SE5			G?	I																				√																											
Salix	*species*	Willow species													√																																									
Salix X	*rubens*	Reddish Willow		-4	-3	SE4			HYB																																																	
Saxifragaceae		**Saxifrage Family**																																																						
Chrysosplenium	*americanum*	Golden Saxifrage	8	-5		S5			G5	X																																															
Penthorum	*sedoides*	Ditch Stonecrop	4	-5		S5			G5	X																																							√							
Saxifragaceae		**Saxifrage Family**																																																					
Tiarella	*cordifolia*	False Mitrewort/foamflower	6	1		S5			G5	X																																															
Scrophulariaceae		**Figwort Family**																																																						
Chelone	*glabra*	Turtlehead	7	-5		S5			G5	X				√																																												
Verbascum	*thapsus*	Common Mullein		5	-2	SE5			G?	I												√																																			
Veronica	*anagallis-aquatica*	Water Speedwell		-5	-1	SE5			G5	I																		√																													
Veronica	*officinalis*	Common Speedwell		5	-2	SE5			G5	I																√																															
Solanaceae		**Nightshade Family**																																																						
Solanum	*dulcamara*	Bitter Nightshade		0	-2	SE5			G?	I				√						√					√	√		√		√			√				√	√	√						√											√
Tiliaceae		**Linden Family**																																																					
Tilia	*americana*	American Basswood	4	3		S5			G5	X		√								√	√		√	√	√	√			√			√					√							√	√								√			√
Ulmaceae		**Elm Family**																																																				
Ulmus	*americana*	White Elm	3	-2		S5			G5?	X			√	√		√		√		√	√	√	√	√	√		√	√		√	√	√	√			√	√	√						√	√	√	√	√						√	√	√	√			
Ulmus	*species*	Elm species																																																					
Ulmus	*rubra*	Slippery Elm	6	0		S5			G5	X																																														
Urticaceae		**Nettle Family**																																																					
Boehmeria	*cylindrica*	False Nettle	4	-5		S5			G5	X																																			√											
Laportea	*canadensis*	Wood Nettle	6	-3		S5			G5	X																																													
Pilea	*pumila*	Dwarf Clearweed	5	-3		S5			G5	X																																													
Urtica	*dioica ssp. dioica*	European Stinging Nettle		-1	-1	SE2			G5T?																																														
Verbenaceae		**Vervain Family**																																																					
Verbena	*hastata*	Blue Vervain	4	-4		S5			G5	X																				√				√				√							√									√		
Verbena	*urticifolia*	White Vervain	4	-1		S5			G5	X																																													
Violaceae		**Violet Family**																																																					
Viola	*canadensis*	Canada Violet	6	5		S5			G5	X																																													
Viola	*conspersa*	Dog Violet	4	-2		S5			G5	X																																												√
Viola	*pubescens*	Downy Yellow Violet	5	4		S5			G5	X										√																																	√	
Viola	*rostrata*	Long-spurred Violet	6	3		S5			G5	X																																											√
Viola	*sororia*	Woolly Blue Violet	4	1		S5			G5	X				√						√																																		
Viola	*species*	Violet species																									√		√																							√		
Vitaceae		**Grape Family**																																																				
Parthenocissus	*inserta*	Thicket creeper	3	3		S5			G5	X		√		√						√			√			√			√								√							√								√		
Vitis	*riparia*	Riverbank Grape	0	-2		S5			G5	X		√	√	√		√				√	√	√		√		√			√	√			√	√			√							√							√	√		√
MONOCOTYLEDONS		**MONOCOTS**																																																				
Alismataceae		**Water-plantain Family**																																																				
Alisma	*plantago-aquatica*	Common Water-plantain	3	-5		S5			G5	X																																												
Sagittaria	*latifolia*	Broad-leaved Arrowhead	4	-5		S5			G5	X																																												
Araceae		**Arum Family**																																																				
Arisaema	*triphyllum*	Small Jack-in-the-pulpit	5	-2		S5			G5T5	X				√											√	√		√	√				√				√		√				√		√							√			√
Calla	*palustris*	Wild Calla	8	-5		S5			G5																																													
Cyperaceae		**Sedge Family**																																																				
Carex	*arctata*	Drooping Wood Sedge	5	5		S5			G5?	X												√						√																										√
Carex	*bebbii*	Bebb's Sedge	3	-5		S5			G5	X																																												
Carex	*blanda*	Woodland Sedge	3	0		S5			G5?	X												√						√																								√		
Carex	*crinita*	Fringed Sedge	6	-4		S5			G5	X																																												
Carex	*comosa*	Bristly Sedge	5	-5		S5			G5	X																																												
Carex	*communis*	Fibrous Rooted Sedge	6	5		S5			G5	X																																											√	
Carex	*flava*	Yellow Sedge	5	-5		S5			G5	X																																												
Carex	*intumescens*	Bladder Sedge	6	-4		S5			G5	X				√																																								
Carex	*gracillima*	Graceful Sedge	4	3		S5			G5	X				√												√																												
Carex	*grayi*	Gray's Sedge	8	-4		S4			G4																																														

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW1497/1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085	483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450		456	459	460		462	463			470	475	480									481	483	484		487	488	490	492	494	493/ 496	495	498	501		504		506	508
				Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUW1f	SWT2-10	FOD5-1	CUP3-2	FOD4&7 / SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2	CUM1-1	FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUW1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3	SWD2-2	CUP3-2	FOD5-2	CUT1b	CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2 CUM1-1	SWT2-2	FOD5-2	CUP3-2	CUP1-3 MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
Carex	*lupulina*	Hop Sedge	6	-5		S5			G5	X				√																																													
Carex	*pedunculata*	Long-stalked Sedge	5	5		S5			G5	X																																																
Carex	*pensylvanica*	Pennsylvania Sedge	5	5		S5			G5	X																																√																	
Carex	*plantaginea*	Plantain-leaved Sedge	7	5		S5			G5	X																			√										√																			
Carex	*platyphylla*	Broad-leaved Sedge	7	5		S5			G5																						√																												
Carex	*radiata*	Radiate Sedge	4	5		S5			G4	X				√																																														
Carex	*retrorsa*	Retrorse Sedge	5	-5		S5			G5	X																																																	
Carex	*species*	Sedge species																																							√																		√
Carex	*stipata*	Awl-fruited Sedge	3	-5		S5			G5	X																																																	
Carex	*stricta*	Tussock Sedge	4	-5		S5			G5	X																																																	
Carex	*vulpinoidea*	Fox Sedge	3	-5		S5			G5	X																√																																	
Schoenoplectus	*acutus var. acutus*	Hard-stemmed Bulrush	6	-5		S5			G5																																																		
Schoenoplectus	*tabernaemontani*	American Great Bulrush/softstem bulrus	5	-5		S5			G?	X																																																
Schoenoplectus	*atrovirens*	Dark-green Bulrush	3	-5		S5			G5?	X																																																
Juncaceae		**Rush Family**																																																								
Juncus	*articulatus*	Jointed Rush	5	-5		S5			G5	X																																																
Juncus	*canadensis*	Canada Rush	6	-5		S5			G5																																																		
Juncus	*compressus*	Compressed Rush		-4	-1	SE5			G5																																																	
Juncus	*tenuis*	Path Rush	0	0		S5			G5	X																																																
Juncus	*effusus var. solutus*	Soft Rush	4	-5		S5			G5T?																																																	
Juncus	*species*	Rush species																																																							
Liliaceae		**Lily Family**																																																							
Allium	*tricoccum*	Wild Leek	7	2		S5			G5																				√		√											√																√
Asparagus	*officinalis*	Garden Asparagus		3	-1	SE5			G5?	I																																																
Erythronium	*americanum ssp. americanum*	Yellow Dog's-tooth Violet	5	5		S5			G5T5	X																																															√
Maianthemum	*canadense*	Wild Lily-of-the-valley	5	0		S5			G5	X																																																√
Maianthemum	*racemosum*	False Solomon's Seal	4	3		S5			G5T	X										√			√			√																																√
Maianthemum	*stellatum*	Star-flowered Solomon's Seal	6	1		S5			G5	X																																															
Polygonatum	*biflorum*	Hairy Solomon's Seal	8	3		S4			G5																																																
Polygonatum	*pubescens*	Hairy Solomon's Seal	5	5		S5			G5																																																
Trillium	*erectum*	Purple Trillium	6	1		S5			G5	X																																															
Trillium	*grandiflorum*	White Trillium	5	5		S5			G5	X																√																														√
Trillium	*species*	Trillium species																																																					
Uvularia	*grandiflora*	Large-flowered Bellwort	6	5		S5			G5																																															
Lemnaceae		**Duckweed Family**																																																						
Lemna	*minor*	Lesser Duckweed	2	-5		S5			G5	X										√								√																												
Orchidaceae		**Orchid Family**																																																					
Epipactis	*helleborine*	Common Helleborine		5	-2	SE5			G?	I				√						√					√				√																											√
Poaceae		**Grass Family**																																																					
Agrostis	*gigantea*	Red-top		0	-2	SE5			G4G5	I																																															
Agrostis	*stolonifera*	Redtop		-3		S5			G5	X																																														
Bromus	*inermis*	Smooth Brome		5	-3	SE5			G4G5T	I												√								√	√		√		√		√		√																
Calamagrostis	*canadensis*	Blue-joint Grass	4	-5		S5			G5	X																																													
Cinna	*latifolia*	Broad-leaved Reed Grass	7	-4		S5			G5	X																																												
Dactylis	*glomerata*	Orchard Grass		3	-1	SE5			G?	I				√						√		√				√				√				√	√	√																		
Echinochloa	*crusgalli*	Common Barnyard Grass		-3	-1	SE5			G?																																														√
Elymus	*repens*	Quack Grass		3	-3	SE5			G?	I																			√																										
Elymus	*riparius*	River-bank Wild Rye	7	-3		S4?			G5	X																			√																										
Glyceria	*grandis*	Tall Manna Grass	5	-5		S4S5			G5	X																																												
Glyceria	*striata*	Fowl Meadow Grass	3	-5		S5			G5	X				√								√							√																										
Leersia	*oryzoides*	Rice Cut Grass	3	-5		S5			G5	X										√									√		√																								
Lolium	*arundinaceum*	Tall Fescue		2	-1	SE5			G?	I				√																																								
Oryzopsis	*asperifolia*	White-grained Mountain-rice	6	5		S5			G5	X																																													
Panicum	*capillare*	Witch Grass	0	0		S5			G5	X																																													
Panicum	*species*	Grass																																																					√
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5			G5	X		√	√	√		√						√						√		√	√	√		√																		
Phleum	*pratense*	Timothy		3	-1	SE5			G?	I				√	√																																							
Phragmites	*australis*	Common Reed	0	-4		S5			G5																																													
Poa	*compressa*	Canada Blue Grass	0	2		S5			G?	X																√																												
Poa	*nemoralis*	Woodland Spear Grass		0	-1	SE3			G5																																													
Poa	*palustris*	Fowl Meadow Grass	5	-4		S5			G5	X																																												
Poa	*pratensis ssp. pratensis*	Kentucky Bluegrass	0	1		S5			G5T	X		√		√																																								√
Poa	*species*	Grass Species																										√																										
Setaria	*viridis*	Green Foxtail			-1	SE5			G?	I																																												
Setaria	*faberi*	Giant Foxtail		2	-1	SE4			G?	I																																												
Setaria	*pumila*	Yellow Foxtail		0	-1	SE5			G?	I					√						√		√																														
Setaria	*species*	Foxtail																																																				√

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Huron County	426 BLW1813	427 BLW1819	437 BLW1082	439 BLW1854/1856	442 BLW1459/1063	442 BLW1459/1063	442 BLW1063	450 BLW1067	450 BLW1067	456 BLW1455	459 BLW1557	460 BLW1619	460 BLW1619	462 BLW1555	463 BLW1055	463 BLW1022	463 BLW1497/1521/ 1522/1055	470 BLW1450	475 BLW1005	480 BLW1011	480 BLW1499	480 BLW1524	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1085/1074	480 BLW1011	480 BLW1011	480 BLW1011	481 BLW1085		483 BLW1089	484 BLW4737	484 BLW1438	487 BLW1023	487 BLW1023/1032	488 BLW1601	490 BLW1031	492 BLW1078	BT3	493/ 496 BLW1502	495 BLW1542	498 BLW1075	501 BLW1079	501 BLW1079	504 BLW1542	504 BLW1542	506 BLW1091	506 BLW1091	508 BLW1051/ 1091
											426	427	437	439	442			450	456	459	460		462	463			470	475	480								481	483	484		487	488	490	492	494	493/ 496	495	498	501		504		506		508
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	Oldham 1993	SDW3	FOD7-2	SWD3-3	FOD7-2	CUM1-1	CUW1f	SWT2-10	FOD5-1	CUP3-2	FOD487 / SWD2-2 / FOD5-7	FOD7-2	CUT1f	FOM3-1	FOD7-2	FOD5-1	FOD5-8	FOD5-8	FOD7-2	CUM1-1 FOD7-2	FOD5-2	CUM1-1	CUM1-1	FOD5-7	CUT1a	MAM2-10	CUM1-1	CUW1a	CUM1-1	FOD6-5	CUS1	CUT1e	FOD5-1	SWD3-2	FOD6-5	FOD7-2	SWD3-3 SWD2-2	CUP3-2	FOD5-2	CUT1b	CUM1-1	CUP3-9	FOD6-5	FOD7	MAM2-2 CUM1-1	SWT2-2	FOD5-2	CUP3-2	CUP1-3 MAM	SWT2	FOD5-1	MAS2-9	MAM2-10	FOD5-2
Smilacaceae		**Catbrier Family**																																																						
Smilax	*herbacea*	Herbaceous Carrion Flower	5	0		S4			G5																																			√														
Typhaceae		**Cattail Family**																																																					
Typha	*angustifolia*	Narrow-leaved Cattail	3	-5		S5			G5	X															√																																
Typha	*latifolia*	Broad-leaved Cattail	3	-5		S5			G5	X																				√			√																								

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity			
Total Species:		**351**	
Native Species:		**249**	70.94%
Exotic Species		**102**	29.06%
Total Taxa in Region (List Region, Source)		10000	
% Regional Taxa Recorded		3.51%	
Regionally Significant Species		0	
S1-S3 Species		1	
S4 Species		7	
S5 Species		234	
Co-efficient of Conservatism and Floral Quality Index			
Co-efficient of Conservatism (CC) (average)		**4.39**	
CC 0 to 3	*lowest sensitivity*	76	30.52%
CC 4 to 6	*moderate sensitivity*	145	58.23%
CC 7 to 8	*high sensitivity*	28	11.24%
CC 9 to 10	*highest sensitivity*	0	0.00%
Floral Quality Index (FQI)		**69.27**	
Presence of Weedy & Invasive Species			
mean weediness		**-1.67**	
weediness = -1	*low potential invasiveness*	53	51.96%
weediness = -2	*moderate potential invasiveness*	30	29.41%
weediness = -3	*high potential invasiveness*	19	18.63%
Presence of Wetland Species			
average wetness value		**0.67**	
upland		90	25.64%
facultative upland		76	21.65%
facultative		50	14.25%
facultative wetland		70	19.94%
obligate wetland		50	14.25%

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	510 BLW1049	510 BLW1010	510 BLW1679	510 BLW1010	512 BT3	512 BT3	514 BLW1656	514 BLW1658	514 BLW1658	BT1	518 BLW1056	518 BLW1056/1047	518 BLW1005	520_BT2	524 BLW1002	525 BLW1047	532 BLW1087	532 BLW1505	532 BLW1048/1087	534 BLW1069/ 1058	534 BLW1057	534 BLW1058/1069	534 BLW1645	534 BLW1647	537 BLW1086/1019	537 BLW1035/1019	539 BLW1478	541 BLW1508	541 BLW1065	541 BLW1065	541 BLW1065	542 BLW1029	542 BLW1029	544 BLW1510	545_BLW1479	BT4	BT4	BT4	BT5	BT5	BT12	BT13	BT13	BT13B
										510				512		514				518			520	524	525	532			534					537		539	541				542		544	545	551	552	553	555	556	561	562	563	564/565
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1 SWD4	SWD3-3 FOD6-5	SWD2-2	SWC17 MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3 CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2	SWD3	SWD3-3	FOD5-2	SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW1o	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
PTERIDOPHYTES		**FERNS & ALLIES**																																																		
Dryopteridaceae		**Wood Fern Family**																																																	
Athyrium	*filix-femina var. angustum*	Northern Lady Fern	4	0		S5			G5T5																																										
Dryopteris	*carthusiana*	Spinulose Wood Fern	5	-2		S5			G5				√									√					√															√									
Dryopteris	*intermedia*	Evergreen Wood Fern	5	0		S5			G5		√																																								
Dryopteris	*marginalis*	Marginal Wood Fern	5	3		S5			G5																															√													
Matteuccia	*struthiopteris*	Ostrich Fern	5	-3		S5			G5																																											
Onoclea	*sensibilis*	Sensitive Fern	4	-3		S5			G5	√		√	√									√					√			√	√					√					√										
Polystichum	*acrostichoides*	Christmas Fern	5	5		S5			G5			√	√																	√						√															
Equisetaceae		**Horsetail Family**																																																	
Equisetum	*arvense*	Field Horsetail	0	0		S5			G5		√	√												√													√														
Equisetum	*hyemale var. affine*	Scouring-rush	2	-2		S5			G5T5													√																													
Equisetum	*pratense*	Meadow Horsetail	8	-3		S5			G5																															√	√													
Equisetum	*species*	Horestail species																																																	
Equisetum	*sylvaticum*	Wood Horsetail	7	-3		S5			G5																													√														
Thelypteridaceae		**Marsh Fern Family**																																																	
Thelypteris	*noveboracensis*	New York Fern	7	-1		S4S5			G5																																											
GYMNOSPERMS		**CONIFERS**																																																	
Pinaceae		**Pine Family**																																																	
Larix	*laricina*	Tamarack	7	-3		S5			G5																																										
Picea	*abies*	Norway Spruce		5	-1	SE3			G?																																										
Picea	*glauca*	White Spruce	6	3		S5			G5													√																					√		√						√	
Picea	*pungens*	Colorado Spruce				SE1			G5																																					√	√				√		
Pinus	*nigra*	Austrian Pine		-5	-1	SE2			G?																						√																					
Pinus	*resinosa*	Red Pine	8	3		S5			G5																																											
Pinus	*strobus*	Eastern White Pine	4	3		S5			G5																															√					√		√						
Pinus	*sylvestris*	Scotch Pine		5	-3	SE5			G?																						√														√	√						
Tsuga	*canadensis*	Eastern Hemlock	7	3		S5			G5													√																		√												
Cupressaceae		**Cedar Family**																																																	
Juniperus	*virginiana*	Eastern Red Cedar	4	3		S5			G5																													√	√	√												
Thuja	*occidentalis*	Eastern White Cedar	4	-3		S5			G5					√		√			√																	√	√													√		√
DICOTYLEDONS		**DICOTS**																																																
Aceraceae		**Maple Family**																																																
Acer	*rubrum*	Red Maple	4	0		S5			G5							√	√													√		√																			
Acer	*saccharinum*	Silver Maple	5	-3		S5			G5			√					√							√					√		√	√	√								√									
Acer	*saccharum*	Sugar Maple	4	3		S5			G5T?	√		√	√							√	√	√	√		√	√	√		√		√		√	√	√	√			√			√				√	√	√	√		√
Acer	*negundo*	Manitoba Maple	0	-2		S5			G5										√							√																	√								
Acer	*nigrum*	Black Maple	7	3		S4?			G5Q				√																																				√			
Acer X	*freemanii*	Freeman's Maple				S5						√							√			√																									√			
Amaranthaceae		**Amaranth Family**																																																
Amaranthus	*retroflexus*	Green Amaranth		2	-1	SE5			G?																																										
Anacardiaceae		**Sumac or Cashew Family**																																																
Rhus	*hirta*	Staghorn Sumac	1	5		S5			G5																																										
Toxicodendron	*radicans ssp. negundo*	Poison-ivy	5	-1		S5			G5T			√	√												√	√	√		√	√				√	√				√						√						
Annonaceae		**Custard-apple Family**																																																
Cryptotaenia	*canadensis*	Honewort	5	0		S5			G5																																										
Apiaceae		**Carrot or Parsley Family**																																																
Daucus	*carota*	Wild Carrot		5	-2	SE5			G?								√		√		√					√			√														√	√						
Pastinaca	*sativa*	Wild Parsnip		5	-3	SE5			G?																																										
Apocynaceae		**Dogbane Family**																																																	
Apocynum	*cannabinum*	Indian Hemp		1		S5			G5T																															√												
Apocynum	*Species*	Hemp species																																										√							
Aristolochiaceae		**Duchman's-pipe Family**																																																
Asarum	*canadense*	Wild Ginger	6	5		S5			G5													√																													
Asclepiadaceae		**Milkweed Family**																																																
Asclepias	*incarnata ssp. incarnata*	Swamp Milkweed	6	-5		S5			G5T5																																										
Asclepias	*syriaca*	Common Milkweed	0	5		S5			G5										√																									√				√	√		
Asteraceae		**Composite or Aster Family**																																																
Achillea	*millefolium var. millefolium*	Common Yarrow		3	-1	SE?			G5T?																																										
Ageratina	*altissima var. altissima*	White Snakeroot	5	3		S5			G5																																			√							
Ambrosia	*artemisiifolia*	Common Ragweed	0	3		S5			G5																					√																				
Arctium	*minus*	Common Burdock		5	-2	SE5			G?T?		√	√	√			√	√		√		√		√	√				√									√						√							
Bidens	*cernua*	Stick-tight	2	-5		S5			G5																																										
Bidens	*frondosa*	Devil's Beggar-ticks	3	-3		S5			G5		√		√																																						
Centaurea	*jacea*	Brown Knapweed		5	-1	SE5			G?																																										
Cichorium	*intybus*	Chicory		5	-1	SE5			G?																																									
Cirsium	*arvense*	Canada Thistle		3	-1	SE5			G?																																									

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	510 BLW1049	510 BLW1010	510 BLW1679	510 BLW1010	512 BT3	512 BT3	514 BLW1656	514 BLW1658	514 BLW1658	BT1	518 BLW1056	518 BLW1056/1047	518 BLW1005	520_BT2	524 BLW1002	525 BLW1047	532 BLW1087	532 BLW1505	532 BLW1048/1087	534 BLW1069/ 1058	534 BLW1057	534 BLW1058/1069	534 BLW1645	534 BLW1647	537 BLW1086/1019	537 BLW1035/1019	539 BLW1478	541 BLW1508	541 BLW1065	541 BLW1065	541 BLW1065	541 BLW1065	542 BLW1029	542 BLW1029	544 BLW1510	545_BLW1479	BT4	BT4	BT4	BT5	BT5	BT12	BT13	BT13	BT13B
										510				512		514				518			520	524	525	532			534					537		539	541					542		544	545	551	552	553	555	556	561	562	563	564/565	
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1 SWD4	SWD3-3 FOD6-5	SWD2-2	SWC17 MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3 CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2 SWD3	SWD3-3	FOD5-2	SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW10	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
Cirsium	*vulgare*	Bull Thistle		4	-1	SE5			G5																		√									√																		
Conyza	*canadensis*	Horseweed	0	1		S5			G5		√		√													√																													
Erigeron	*annus*	Eastern Daisy Fleabane	0	1		S5			G5			√													√			√								√					√												
Erigeron	*philadelphicus ssp. philadelphicus*	Philadelphia Fleabane	1	-3		S5			G5T?			√																																									
Erigeron	*strigosus*	Prairie Fleabane	1			S5			G5																																													
Eupatorium	*perfoliatum*	Perfoliate Thoroughwort/Boneset	2	-4		S5			G5																													√		√														
Eupatorium	*maculatum*	Spotted Joe-pye-weed	3	-5		S5			G5T5																													√	√		√													
Eurybia	*macrophylla*	Large-leaved Aster	5	5		S5			G5													√																																
Euthamia	*graminifolia*	Flat-topped Bushy Goldenrod	2	-2		S5			G5																													√		√														
Hieracium	*caespitosum*	Field Hawkweed		5	-2	SE5																																															
Inula	*helenium*	Elecampane		5	-2	SE5			G?																																												
Lactuca	*Species*	Lettuce species																																																			
Lactuca	*biennis*	Biennial Lettuce	6	0		S5			G5																																												
Lactuca	*serriola*	Prickly Lettuce		0	-1	SE5			G?																																												
Leucanthemum	*vulgare*	Ox-eye Daisy		5	-1	SE5			G?																																					√							
Packera	*paupercula*	Balsam Groundsel	7	-1		S5			G5																															√													
Prenanthes	*alba*	White Rattlesnake-root	6	3		S5			G5																																												
Prenanthes	*altissima*	White lettuce	5	3		S5			G5?																																												
Rudbeckia	*hirta*	Black-eyed Susan	0	3		S5			G5																																												
Solidago	*altissima*	Tall Goldenrod	1	3		S5					√	√	√			√					√				√		√			√						√	√	√	√													
Solidago	*caesia*	Blue-stemmed Goldenrod	5	3		S5			G5																													√			√			√									
Solidago	*canadensis*	Canada Goldenrod	1	3		S5			G5												√															√		√														
Solidago	*flexicaulis*	Zig-zag Goldenrod	6	3		S5			G5		√	√	√							√			√	√		√						√			√							√									
Solidago	*gigantea*	Giant Goldenrod	4	-3		S5			G5			√																								√		√														
Solidago	*juncea*	Early Goldenrod	3	5		S5			G5																																												
Solidago	*species*	Goldenrod species																	√				√				√	√													√		√		√	√	√						
Solidago	*nemoralis ssp. nemoralis*	Gray Goldenrod	2	5		S5			G5T?																																												
Sonchus	*arvensis ssp. arvensis*	Field Sow-thistle				SE5			G?T?																																												
Symphyotrichum	*species*	Aster species								√																	√															√	√			√							
Symphyotrichum	*cordifolium*	Heart-leaved Aster	5	5		S5			G5													√																															
Symphyotrichum	*ericoides*	White Heath Aster	4	4		S5			G5T?																												√																
Symphyotrichum	*lateriflorum*	Calico Aster	3	-2		S5			G5T5			√																					√										√								
Symphyotrichum	*lanceolatum*	Tall White Aster	3	-3		S5			G5T?		√	√	√			√					√				√				√							√	√	√														
Symphyotrichum	*novae-angliae*	New England Aster	2	-3		S5			G5												√															√	√			√												
Symphyotrichum	*pilosus*	Hairy Aster	4	2		S5			G5T?																																												
Symphyotrichum	*puniceum*	Purple-stemmed Aster				S5			G5T?																					√													√										
Tanacetum	*vulgare*	Common Tansy		5	-1	SE5			G?																		√																									
Taraxacum	*officinale*	Common Dandelion		3	-2	SE5			G5	√		√												√	√	√		√								√						√									
Tussilago	*farfara*	Coltsfoot		3	-2	SE5			G?																																												
Xanthium	*spinosum*	Spiny Cocklebur		3	-1	SE2?			G?																																												
Balsaminaceae		**Touch-me-not Family**																																																		
Impatiens	*capensis*	Spotted Touch-me-not	4	-3		S5			G5		√	√	√						√				√						√				√			√		√	√			√									
Berberidaceae		**Barberry Family**																																																		
Caulophyllum	*thalictroides*	Blue Cohosh	6	5		S5			G	√	√		√								√		√	√		√		√		√			√	√		√		√	√										
Podophyllum	*peltatum*	May-apple	5	3		S5			G5	√										√				√		√		√		√											√										
Betulaceae		**Birch Family**																																																		
Betula	*alleghaniensis*	Yellow Birch	6	0		S5			G5	√		√									√						√			√						√					√										
Betula	*papyrifera*	White Birch		2		S5			G5																																			√									
Carpinus	*caroliniana*	Blue Beech	6	0		S5			G5T	√																	√															√									
Ostrya	*virginiana*	Hop Hornbeam - Ironwood	4	4		S5			G5	√		√	√										√	√	√		√			√			√	√		√					√	√					√	√		
Boraginaceae		**Borage Family**																																																	
Echium	*vulgare*	Blueweed/common vipersbugloss		5	-2	SE5			G?																																											
Lithospermum	*officinale*	Common Gromwell		5	-1	SE5			G?																																											
Brassicaceae		**Mustard Family**																																																	
Alliaria	*petiolata*	Garlic Mustard		0	-3	SE5			G5	√		√				√				√	√	√		√	√	√		√	√	√			√	√	√					√	√		√	√	√					
Barbarea	*vulgaris*	Yellow Rocket		0	-1	SE5			G?												√				√																										
Cardamine	*bulbosa*	Bulbous Cress	8	-5		S4			G5																																											
Cardamine	*concatenata*	Cut-leaved Toothwort	6	3		S5			G5																																											
Cardamine	*diphylla*	Broad-leaf Toothwort	7	5		S5																			√		√																√									
Cardamine	*pensylvanica*	Pensylvania Bitter-cress	6	-4		S5			G5																																											
Hesperis	*matronalis*	Dame's Rocket		5	-3	SE5			G4G5																		√																									
Rorippa	*nasturtium-aquaticum*	Water-cress		-5	-1	SE?			G?																																											
Caprifoliaceae		**Honeysuckle Family**																																																	
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SE5			G?																																											
Sambucus	*canadensis*	Common Elderberry	5	-2		S5			G5				√														√													√												
Sambucus	*racemosa var. racemosa*	Red-berried Elderberry	5	2		S5			G5T4T5											√														√	√																
Sambucus	*species*	Elderberry species																																																		

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	510 BLW1049	510 BLW1010	510 BLW1679	510 BLW1010	512 BT3	512 BT3	514 BLW1656	514 BLW1658	514 BLW1658	BT1	518 BLW1056	518 BLW1056/1047	518 BLW1005	520_BT2	524 BLW1002	525 BLW1047	532 BLW1087	532 BLW1505	532 BLW1048/1087	534 BLW1069/ 1058	534 BLW1057	534 BLW1058/1069	534 BLW1645	534 BLW1647	537 BLW1086/1019	537 BLW1035/1019	539 BLW1478	541 BLW1508	541 BLW1065	541 BLW1065	541 BLW1065	542 BLW1029	542 BLW1029	544 BLW1510	545_BLW1479	BT4	BT4	BT4	BT5	BT5	BT12	BT13	BT13	BT13B
										510				512		514				518			520	524	525	532			534					537		539	541				542		544	545	551	552	553	555	556	561	562	563	564/565
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1 SWD4	SWD3-3 FOD6-5	SWD2-2	SWC17 MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3 CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2 SWD3	SWD3-3	FOD5-2 SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW1o	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
Triosteum	*aurantiacum*	Wild Coffee	7	5		S5			G5																																												
Viburnum	*acerifolium*	Maple-leaved Viburnum	6	5		S5			G5							√																				√																	
Viburnum	*lentago*	Nannyberry	4	-1		S5			G5																																												
Viburnum	*opulus*	highbush cranberry	5	-3		S5			G5T5																										√					√														
Caryophyllaceae		**Pink Family**																																																				
Dianthus	*armeria*	Deptford Pink		5	-1	SE5			G?																																			√											
Saponaria	*officinalis*	Bouncing-bet		3	-3	SE5			G?																	√																												
Stellaria	*media*	Common Chickweed		3	-1	SE5			G?																																														
Celastraceae		**Staff-tree Family**																																																				
Euonymus	*obovata*	Running Strawberry-bush	6	5		S5			G5	√		√	√																														√											
Convolvulaceae		**Morning-glory Family**																																																			
Convolvulus	*arvensis*	Field Bindweed		5	-1	SE5			G?																																													
Cornaceae		**Dogwood Family**																																																			
Cornus	*alternifolia*	Alternate-leaved Dogwood	6	5		S5			G5											√		√			√		√							√			√			√	√		√									
Cornus	*racemosa*	Red Panicled Dogwood/Gray dogwood	2	-2		S5			G5?																														√														√
Cornus	*rugosa*	Round-leaved Dogwood	6	5		S5			G5										√																																			
Cornus	*amomum*	Silky Dogwood	5	-4		S5			G5T?																	√					√																						
Cornus	*sericea*	Red-osier Dogwood	2	-3		S5			G5	√																				√							√	√							√						√		
Cucurbitaceae		**Gourd Family**																																																			
Echinocystis	*lobata*	Prickly Cucumber	3	-2		S5			G5																																			√											
Dipsacaceae		**Teasel Family**																																																			
Dipsacus	*fullonum ssp. sylvestris*	Wild Teasel		5	-1	SE5			G?T?										√																																			
Elaeagnaceae		**Oleaster Family**																																																			
Elaeagnus	*angustifolia*	Russian Olive		4	-1	SE3			G?																																													
Euphorbiaceae		**Spurge Family**																																																			
Acalypha	*rhomboidea*	Three-seeded Mercury	0	3		S5			G5T5																					√																							
Fabaceae		**Pea Family**																																																			
Coronilla	*varia*	Variable Crown-vetch		5	-2	SE5			G?																																												
Gleditsia	*triacanthos*	Honey Locust	3	0		S2			G5																																												
Lotus	*corniculatus*	Bird's-foot Trefoil		1	-2	SE5			G?																																												
Medicago	*lupulina*	Black Medick		1	-1	SE5			G?																																												
Medicago	*sativa ssp. sativa*	Alfalfa		5	-1	SE5			G?T?																																												
Melilotus	*alba*	White Sweet-clover		3	-3	SE5			G?																																									√				
Melilotus	*officinalis*	Yellow Sweet-clover		3	-1	SE5			G?																																												
Robinia	*pseudo-acacia*	Black Locust		4	-3	SE5			G5																																												
Trifolium	*hybridum ssp. elegans*	Alsike Clover		1	-1	SE5																																															
Trifolium	*pratense*	Red Clover		2	-2	SE5			G?																																									√	√				
Trifolium	*repens*	White Clover		2	-1	SE5			G?																	√																												
Vicia	*cracca*	Tufted Vetch		5	-1	SE5			G?							√																												√										
Vicia	*tetrasperma*	Slender Vetch		5	-1	SE5			G?																																													
Fagaceae		**Beech Family**																																																			
Fagus	*grandifolia*	American Beech	6	3		S5			G5			√								√		√		√	√		√		√					√	√		√			√			√	√									
Quercus	*alba*	White Oak	6	3		S5			G5														√																													√		
Quercus	*macrocarpa*	Bur Oak	5	1		S5			G5			√																																								√		
Quercus	*rubra*	Red Oak	6	3		S5			G5																	√																											
Quercus	*species*	Oak species																																																				
Fumariaceae		**Fumitory Family**																																																			
Dicentra	*canadensis*	Squirrel-corn	7	5		S5			G5																																													
Dicentra	*cucullaria*	Dutchman's-breeches	6	5		S5			G5																																												
Geraniaceae		**Geranium Family**																																																			
Geranium	*maculatum*	Spotted Crane's-bill	6	3		S5			G5	√		√																	√	√											√											
Geranium	*robertianum*	Herb-robert		5	-2	SE5			G5	√	√	√	√												√	√	√		√	√			√							√	√							√			
Grossulariaceae		**Currant Family**																																																			
Ribes	*americanum*	Wild Black Currant	4	-3		S5			G5			√	√																																								
Ribes	*cynosbati*	Prickly Gooseberry	4	5		S5			G5	√		√	√							√		√			√		√							√			√					√										
Ribes	*lacustre*	Swamp Black Currant	7	-3		S5			G5																																													
Ribes	*rubrum*	Red Currant		5	-2	SE5			G4G5																																													
Ribes	*triste*	Wild Red Currant	6	-5		S5			G5																					√						√																	
Ribes	*species*	Currant species																																																				
Guttiferae		**St. John's-wort Family**																																																			
Hypericum	*perforatum*	Common St. John's-wort		5	-3	SE5			G?	√																√																				√	√	√	√					
Hamamelidaceae		**Witch-hazel Family**																																																			
Hamamelis	*virginiana*	Witch-hazel	6	3		S5			G5																																													
Hydrophyllaceae		**Water-leaf Family**																																																			
Hydrophyllum	*virginianum*	Virginia Water-leaf	6	-2		S5			G5	√										√						√																											
Hippocastanaceae		**Buckeye Family**																																																			
Aesculus	*hippocastanum*	Horse Chestnut		5	-1	SE2			G?																																													

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BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	510 BLW1049	510 BLW1010	510 BLW1679	510 BLW1010	512 BT3	512 BT3	514 BLW1656	514 BLW1658	514 BLW1658	BT1	518 BLW1056	518 BLW1056/1047	518 BLW1005	520_BT2	524 BLW1002	525 BLW1047	532 BLW1087	532 BLW1505	532 BLW1048/1087	534 BLW1069/ 1058	534 BLW1057	534 BLW1058/1069	534 BLW1645	534 BLW1647	537 BLW1086/1019	537 BLW1035/1019	539 BLW1478	541 BLW1508	541 BLW1065	541 BLW1065	541 BLW1065	541 BLW1065	542 BLW1029	542 BLW1029	544 BLW1510	545_BLW1479	BT4	BT4	BT4	BT5	BT5	BT12	BT13	BT13	BT13B
										510				512		514				518			520	524	525	532			534					537		539	541					542		544	545	551	552	553	555	556	561	562	563	564/565	
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1 SWD4	SWD3-3 FOD6-5	SWD2-2	SWC17 MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3 CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2 SWD3	SWD3-3	FOD5-2 SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW1o	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
Iridaceae		**Iris Family**																																																				
Iris	*versicolor*	Multi-coloured Blue-flag	5	-5		S5			G5																																												
Juglandaceae		**Walnut Family**																																																		
Carya	*cordiformis*	Bitternut hickory	6	0		S5			G5	√		√	√																	√																√	√						
Carya	*ovata*	Shagbark Hickory	6	3		S5			G5																							√	√					√														
Juglans	*cinerea*	Butternut	6	2		S3?			G4																																													
Juglans	*nigra*	Black Walnut	5	3		S4			G5						√															√			√		√		√									√	√				√	√	√
Lamiaceae		**Mint Family**																																																		
Clinopodium	*vulgaris*	Wild basil	4	5		S5																																	√															
Lamium	*purpureum*	Purple Dead-nettle		5	-2	SE3			G?																√																												
Leonurus	*cardiaca ssp. cardiaca*	Common Motherwort		5	-2	SE5			G?T?																																													
Lycopus	*americanus*	Cut-leaved Water-horehound	4	-5		S5			G5		√		√																														√											
Lycopus	*uniflorus*	Northern Water-horehound	5	-5		S5			G5																																√													
Mentha	*arvensis*	American Wild Mint	3	-3		S5																						√					√								√												
Nepeta	*cataria*	Catnip		1	-2	SE5			G?																√																												
Origanum	*vulgare*	Wild Marjarom		5	-2	SE5			G?																																													
Prunella	*vulgaris*	Heal-all		0	-1	SE3			G5T?		√		√																	√								√									√						
Scutellaria	*galericulata*	Hooded Skullcap	6	-5		S5			G5		√		√																																									
Lauraceae		**Laurel Family**																																																			
Lindera	*benzoin*	Spicebush	6	-2		S5			G5													√															√															
Malvaceae		**Mallow Family**																																																		
Malva	*moschata*	Musk Mallow		5	-1	SE5			G?															√																													
Malva	*neglecta*	Cheeses		5	-1	SE5			G?																																												
Menispermaceae		**Moonseed Family**																																																		
Menispermum	*canadense*	Moonseed	7	0		S4			G5																					√																								
Moraceae		**Mulberry Family**																																																		
Morus	*alba*	White Mulberry		0	-3	SE5			G?																																												
Nymphaeaceae		**Water-lily Family**																																																		
Nuphar	*species*	Pond-lily species																																																			
Oleaceae		**Olive Family**																																																		
Fraxinus	*americana*	White Ash	4	3		S5			G5	√		√	√							√				√	√		√		√		√		√	√	√	√	√		√	√	√	√	√	√	√				√	√	√
Fraxinus	*nigra*	Black Ash	7	-4		S5			G5					√					√											√						√	√														
Fraxinus	*pennsylvanica*	Green ash	3	-3		S5			G5			√	√	√						√	√						√									√	√			√			√									
Fraxinus	*species*	Ash species														√	√	√																																			
Syringa	*vulgaris*	Common Lilac		5	-2	SE5			G?																																												
Onagraceae		**Evening-primrose Family**																																																	
Circaea	*lutetiana*	Enchanter's Nightshade	3	3		S5			G5T5	√	√	√	√							√				√	√		√		√		√		√			√						√	√	√							
Epilobium	*ciliatum ssp. ciliatum*	Ciliate Willow-herb	3	3		S5			G5T?		√	√	√												√		√		√		√						√							√							
Epilobium	*coloratum*	Purple-veined Willow-herb	3	-5		S5			G5																												√															
Epilobium	*hirsutum*	Great Hairy Willow-herb		-4	-2	SE5			G?																																											
Epilobium	*leptophyllum*	Narrow-leaved Willow-herb	7	-5		S5			G5																																											
Epilobium	*species*	Willow-herb speices																																																	
Oenothera	*biennis*	Common Evening-primrose	0	3		S5			G5																																											
Orobanchaceae		**Broom-rape Family**																																																	
Epifagus	*virginiana*	Beech-drops	6	5		S5			G5																																											
Oxalidaceae		**Wood Sorrel Family**																																																	
Oxalis	*stricta*	Upright Yellow Wood-sorrel	0	3		S5			G5			√																		√																					
Papaveraceae		**Poppy Family**																																																	
Chelidonium	*majus*	Celandine		5	-3	SE5			G?														√		√																											
Sanguinaria	*canadensis*	Bloodroot	5	4		S5			G5		√		√																√																							
Plantaginaceae		**Plantain Family**																																																	
Plantago	*lanceolata*	Ribgrass		0	-1	SE5			G5																																											
Plantago	*major*	Common Plantain		-1	-1	SE5			G5		√		√																																							
Plantago	*rugelii*	Rugel's Plantain	1	0		S5			G5		√		√																									√														
Polygonaceae		**Smartweed Family**																																																	
Polygonum	*lapathifolium*	Pale Smartweed	2	-4		S5			G5																																											
Polygonum	*cuspidatum*	Japanese Knotweed		3	-1	SE4			G?																																											
Polygonum	*hydropiper*	Water-pepper	4	-5		SE5			G5																																											
Polygonum	*persicaria*	Lady's-thumb		-3	-1	SE5			G?		√		√																																						
Rumex	*crispus*	Curly-leaf Dock		-1	-2	SE5			G?	√																√		√																							
Rumex	*obtusifolius*	Bitter Dock		-3	-1	SE5			G5																																											
Rumex	*orbiculatus*	Great Water Dock	6	-5		S4S5			G5																														√														
Primulaceae		**Primrose Family**																																																	
Lysimachia	*ciliata*	Fringed Loosestrife	4	-3		S5			G5			√																		√																					
Lysimachia	*nummularia*	Moneywort		-4	-3	SE5			G?																																										
Lysimachia	*thyrsiflora*	Tufted Loosestrife	7	-5		S5			G5																																										

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

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										510				512		514				518			520	524	525	532			534					537		539	541					542		544	545	551	552	553	555	556	561	562	563	564/565
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1 SWD4	SWD3-3 FOD6-5	SWD2-2	SWC17 / MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3 CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2 SWD3	SWD3-3	FOD5-2 SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW1o	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
Ranunculaceae		**Buttercup Family**																																																			
Actaea	*pachypoda*	White Baneberry	6	5		S5			G5		√		√																√						√						√												
Actaea	*rubra*	Red Baneberry	5	5		S5														√			√	√		√												√														
Actaea	*species*	Baneberry species																																																		
Anemone	*canadensis*	Canada Anemone	3	-3		S5			G5						√																																						
Anemone	*virginiana*	Thimbleweed	4	5		S5			G5T																															√														
Caltha	*palustris*	Marsh-marigold	5	-5		S5			G5																																												
Clematis	*virginiana*	Virgin's-bower	3	0		S5			G5																																	√		√										
Ranunculus	*abortivus*	Kidney-leaf Buttercup	2	-2		S5			G5		√		√									√																															
Ranunculus	*acris*	Tall Buttercup			-2	SE5			G5										√						√								√														√	√				
Ranunculus	*hispidus var. nitidus*	Swamp Buttercup				SR			G5T5			√																																									
Ranunculus	*pensylvanicus*	Bristly Buttercup	3	-5		S5			G5																																												
Ranunculus	*recurvatus var. recurvatus*	Hooked Buttercup	4	-3		S5			G5		√	√	√																								√																
Ranunculus	*sceleratus*	Cursed Buttercup	2	-5		S5			G5T5																																												
Ranunculus	*species*	Buttercup species																	√																																		
Thalictrum	*dioicum*	Early Meadow-rue	5	2		S5			G5													√		√	√		√														√			√								
Rhamnaceae		**Buckthorn Family**																																																		
Rhamnus	*cathartica*	Common Buckthorn		3	-3	SE5			G?	√		√	√			√			√			√		√	√	√				√		√	√		√	√					√						√			√		
Rosaceae		**Rose Family**																																																		
Agrimonia	*gryposepala*	Tall Hairy Agrimony	2	2		S5			G5																				√																							
Amelanchier	*arborea*	Downy Juneberry		3		S5			G5																																												
Amelanchier	*laevis*	Smooth Juneberry	5	5		S5			G4G5Q																														√														
Amelanchier	*species*	Juneberry species																																																√			
Crataegus	*chrysocarpa*	Round-leaved Hawthorn	4	5		S5			G5																																												
Crataegus	*macracantha*	Large-thorned Hawthorn	4	5		S5																																														
Crataegus	*macrosperma*	Variable Thorn	4	5		S5			G5																																												
Crataegus	*mollis*	Downy Thorn	4	-2		S5			G5																	√																											
Crataegus	*monogyna*	English Hawthorn		5	-1	SE5			G5	√																												√												√	√			
Crataegus	*punctata*	Large-fruited Thorn	4	5		S5			G5				√																		√						√															
Crataegus	*species*	Hawthorn species																								√	√																								√		√
Fragaria	*vesca ssp. americana*	Woodland Strawberry	4	4		S5			G5T?		√	√	√																	√							√														
Fragaria	*virginiana*	Virginia Strawberry	2	1		SU			G5T?	√	√		√			√				√				√	√	√							√							√		√				√	√	√			
Geum	*aleppicum*	Yellow Avens	2	-1		S5			G5	√	√		√									√																			√								√			
Geum	*canadense*	White Avens	3	0		S5			G5	√										√				√	√	√		√								√						√		√							
Geum	*urbanum*	Wood Avens		5	-1	SE2			G5		√	√	√																																								
Geum	*species*	Avens species																																																			
Malus	*pumila*	Common apple		5	-1	SE5			G5							√									√												√													√			
Potentilla	*recta*	Rough-fruited Cinquefoil		5	-2	SE5			G?																																		√										
Potentilla	*norvegica ssp. norvegica*	Cinquefoil				SU			G5T?																√																											
Prunus	*avium*	Sweet Cherry		5	-2	SE4			G?				√																								√																
Prunus	*cerasus*	Sour Cherry		5	-1	SE1			G?																												√	√	√				√	√									
Prunus	*nigra*	Canada Plum	4	4		S4			G4G5																																												
Prunus	*pensylvanica*	Pin Cherry	3	4		S5			G5											√				√		√																		√		√							
Prunus	*serotina*	Black Cherry	3	3		S5			G5	√			√							√			√	√		√		√		√			√	√		√				√		√					√			
Prunus	*species*	Cherry Species																	√																																	
Prunus	*virginiana ssp. virginiana*	Choke Cherry	2	1		S5			G5T?			√	√							√	√			√	√	√				√			√	√		√						√						√			
Pyrus	*communis*	Common Pear		5	-1	SE4			G5																												√															
Pyrus	*species*	Pear species																																																		
Rosa	*acicularis ssp. sayi*	Prickly Rose	7	3		S5			G5TU																																											
Rosa	*multiflora*	Multiflora Rose		3	-3	SE4			G?																√												√							√							
Rubus	*allegheniensis*	Alleghany Blackberry	2	2		S5			G5																√		√				√					√		√					√							
Rubus	*idaeus*	Red Raspberry				SE1			G5T5			√				√				√	√			√	√	√				√			√	√		√		√				√		√						
Rubus	*occidentalis*	Black raspberry	2	5		S5			G5			√				√				√	√			√		√				√			√		√	√						√							
Rubus	*pubescens*	Dwarf Raspberry	4	-4		S5			G5			√																																								
Sorbus	*aucuparia*	European Mountain-ash		5	-2	SE4			G5																						√																				
Waldsteinia	*fragarioides*	Barren Strawberry	5	5		S5			G5																												√															
Rubiaceae		**Madder Family**																																																		
Galium	*asprellum*	Rough Bedstraw	6	-5		S5			G5																	√																											
Galium	*mollugo*	White Bedstraw		5	-2	SE5			G?																	√																											
Galium	*triflorum*	Sweet-scented Bedstraw	4	2		S5			G5																																												
Rutaceae		**Rue Family**																																																		
Zanthoxylum	*americanum*	American Prickly-ash	3	5		S5			G5																																												
Salicaceae		**Willow Family**																																																		
Populus	*balsamifera ssp. balsamifera*	Balsam Poplar	4	-3		S5			G5T?																																												
Populus	*alba*	Silver Poplar		5	-3	SE5			G5																																												
Populus	*deltoides ssp. deltoides*	Eastern Cottonwood	4	-1		SU			G5T?						√				√																	√																
Populus	*grandidentata*	Large-tooth Aspen	5	3		S5			G5																	√					√																					

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										510				512		514				518			520	524	525	532			534					537		539	541				542		544	545	551	552	553	555	556	561	562	563	564/565
			≥	Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1	SWD4	SWD3-3	FOD6-5	SWD2-2	SWC17 / MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3	CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2	SWD3	SWD3-3	FOD5-2	SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW10	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
Populus	*tremuloides*	Trembling Aspen		0		S5			G5					√									√													√		√	√	√									√			
Populus X	*canadensis*	Carolina Poplar				SE1			HYB																																											
Salix	*alba*	White Willow			-2	SE4			G5				√																																							
Salix	*amygdaloides*	Peach-leaved Willow	6	-3		S5			G5																					√							√																
Salix	*bebbiana*	Long-beaked Willow	4	-4		S5			G5																√												√	√															
Salix	*discolor*	Pussy Willow	3	-3		S5			G5																					√																							
Salix	*eriocephala*	Missouri Willow	4	-3		S5			G5																					√							√																
Salix	*exigua*	Sandbar Willow	3	-5		S5			G5																																												
Salix	*lucida*	Shining Willow	5	-4		S5			G5																																												
Salix	*petiolaris*	Slender Willow	3	-4		S5			G4																																												
Salix	*fragilis*	Crack Willow		-1	-3	SE5			G?																													√																
Salix	*species*	Willow species																	√				√																														√		√
Salix X	*rubens*	Reddish Willow		-4	-3	SE4			HYB										√																																		√		
Saxifragaceae		**Saxifrage Family**																																																			
Chrysosplenium	*americanum*	Golden Saxifrage	8	-5		S5			G5																						√																							
Penthorum	*sedoides*	Ditch Stonecrop	4	-5		S5			G5																						√																							
Saxifragaceae		**Saxifrage Family**																																																			
Tiarella	*cordifolia*	False Mitrewort/foamflower	6	1		S5			G5	√																																												
Scrophulariaceae		**Figwort Family**																																																			
Chelone	*glabra*	Turtlehead	7	-5		S5			G5																																													
Verbascum	*thapsus*	Common Mullein		5	-2	SE5			G?																	√																												
Veronica	*anagallis-aquatica*	Water Speedwell		-5	-1	SE5			G5																																													
Veronica	*officinalis*	Common Speedwell		5	-2	SE5			G5											√					√																				√								
Solanaceae		**Nightshade Family**																																																			
Solanum	*dulcamara*	Bitter Nightshade		0	-2	SE5			G?		√	√	√										√		√	√							√			√				√												
Tiliaceae		**Linden Family**																																																			
Tilia	*americana*	American Basswood	4	3		S5			G5	√		√	√						√				√	√	√	√		√	√	√			√	√		√				√	√							√		√	
Ulmaceae		**Elm Family**																																																			
Ulmus	*americana*	White Elm	3	-2		S5			G5?	√		√	√				√	√	√	√					√	√			√	√						√				√	√	√	√			√			√	√		√	
Ulmus	*species*	Elm species																																																			
Ulmus	*rubra*	Slippery Elm	6	0		S5			G5																																													
Urticaceae		**Nettle Family**																																																			
Boehmeria	*cylindrica*	False Nettle	4	-5		S5			G5		√	√	√										√																															
Laportea	*canadensis*	Wood Nettle	6	-3		S5			G5																																													
Pilea	*pumila*	Dwarf Clearweed	5	-3		S5			G5		√		√										√																															
Urtica	*dioica ssp. dioica*	European Stinging Nettle		-1	-1	SE2			G5T?								√									√																											
Verbenaceae		**Vervain Family**																																																			
Verbena	*hastata*	Blue Vervain	4	-4		S5			G5																																													
Verbena	*urticifolia*	White Vervain	4	-1		S5			G5																																													
Violaceae		**Violet Family**																																																			
Viola	*canadensis*	Canada Violet	6	5		S5			G5																																													
Viola	*conspersa*	Dog Violet	4	-2		S5			G5																																												
Viola	*pubescens*	Downy Yellow Violet	5	4		S5			G5		√	√	√												√	√																												
Viola	*rostrata*	Long-spurred Violet	6	3		S5			G5											√																																		
Viola	*sororia*	Woolly Blue Violet	4	1		S5			G5			√																		√																							
Viola	*species*	Violet species																									√																										
Vitaceae		**Grape Family**																																																			
Parthenocissus	*inserta*	Thicket creeper	3	3		S5			G5	√		√	√			√	√		√										√		√																						
Vitis	*riparia*	Riverbank Grape	0	-2		S5			G5			√				√	√		√				√			√				√			√			√				√	√										
MONOCOTYLEDONS		**MONOCOTS**																																																		
Alismataceae		**Water-plantain Family**																																																		
Alisma	*plantago-aquatica*	Common Water-plantain	3	-5		S5			G5	√																																											
Sagittaria	*latifolia*	Broad-leaved Arrowhead	4	-5		S5			G5						√																																					
Araceae		**Arum Family**																																																			
Arisaema	*triphyllum*	Small Jack-in-the-pulpit	5	-2		S5			G5T5	√	√	√	√							√	√		√	√		√		√	√				√	√		√				√	√										
Calla	*palustris*	Wild Calla	8	-5		S5			G5													√																															
Cyperaceae		**Sedge Family**																																																			
Carex	*arctata*	Drooping Wood Sedge	5	5		S5			G5?													√		√		√																√										
Carex	*bebbii*	Bebb's Sedge	3	-5		S5			G5			√	√																√																							
Carex	*blanda*	Woodland Sedge	3	0		S5			G5?				√																																								
Carex	*crinita*	Fringed Sedge	6	-4		S5			G5				√																																								
Carex	*comosa*	Bristly Sedge	5	-5		S5			G5																																		√										
Carex	*communis*	Fibrous Rooted Sedge	6	5		S5			G5																																		√										
Carex	*flava*	Yellow Sedge	5	-5		S5			G5																																		√										
Carex	*intumescens*	Bladder Sedge	6	-4		S5			G5	√		√											√						√	√																						
Carex	*gracillima*	Graceful Sedge	4	3		S5			G5			√										√								√							√															
Carex	*grayi*	Gray's Sedge	8	-4		S4			G4																																													

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	510 BLW1049	510 BLW1010	510 BLW1679	510 BLW1010	512 BT3	512 BT3	514 BLW1656	514 BLW1658	514 BLW1658	BT1	518 BLW1056	518 BLW1056/1047	518 BLW1005	520_BT2	524 BLW1002	525 BLW1047	532 BLW1087	532 BLW1505	532 BLW1048/1087	534 BLW1069/ 1058	534 BLW1057	534 BLW1058/1069	534 BLW1645	534 BLW1647	537 BLW1086/1019	537 BLW1035/1019	539 BLW1478	541 BLW1508	541 BLW1065	541 BLW1065	541 BLW1065	541 BLW1065	542 BLW1029	542 BLW1029	544 BLW1510	545_BLW1479	BT4	BT4	BT4	BT5	BT5	BT12	BT13	BT13	BT13B
										510				512		514				518			520	524	525	532			534					537		539	541					542		544	545	551	552	553	555	556	561	562	563	564/565	
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1 SWD4	SWD3-3 FOD6-5	SWD2-2	SWC17 MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3 CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2 SWD3	SWD3-3	FOD5-2	SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW10	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
Carex	*lupulina*	Hop Sedge	6	-5		S5			G5			√	√											√																														
Carex	*pedunculata*	Long-stalked Sedge	5	5		S5			G5				√																	√						√																
Carex	*pensylvanica*	Pennsylvania Sedge	5	5		S5			G5																√					√																						
Carex	*plantaginea*	Plantain-leaved Sedge	7	5		S5			G5											√																																	
Carex	*platyphylla*	Broad-leaved Sedge	7	5		S5			G5																					√																						
Carex	*radiata*	Radiate Sedge	4	5		S5			G4			√																																									
Carex	*retrorsa*	Retrorse Sedge	5	-5		S5			G5				√																	√																						
Carex	*species*	Sedge species												√	√									√				√																									
Carex	*stipata*	Awl-fruited Sedge	3	-5		S5			G5			√												√																													
Carex	*stricta*	Tussock Sedge	4	-5		S5			G5																																												
Carex	*vulpinoidea*	Fox Sedge	3	-5		S5			G5				√																√																								
Schoenoplectus	*acutus var. acutus*	Hard-stemmed Bulrush	6	-5		S5			G5						√																																					
Schoenoplectus	*tabernaemontani*	American Great Bulrush/softstem bulrus	5	-5		S5			G?																																											
Schoenoplectus	*atrovirens*	Dark-green Bulrush	3	-5		S5			G5?																																											
Juncaceae		**Rush Family**																																																			
Juncus	*articulatus*	Jointed Rush	5	-5		S5			G5																																											
Juncus	*canadensis*	Canada Rush	6	-5		S5			G5																																											
Juncus	*compressus*	Compressed Rush		-4	-1	SE5			G5																																											
Juncus	*tenuis*	Path Rush	0	0		S5			G5																																											
Juncus	*effusus var. solutus*	Soft Rush	4	-5		S5			G5T?																																√												
Juncus	*species*	Rush species													√																																					
Liliaceae		**Lily Family**																																																		
Allium	*tricoccum*	Wild Leek	7	2		S5			G5		√		√							√					√	√	√	√						√									√	√								
Asparagus	*officinalis*	Garden Asparagus		3	-1	SE5			G5?																																											
Erythronium	*americanum ssp. americanum*	Yellow Dog's-tooth Violet	5	5		S5			G5T5											√	√					√																	√								
Maianthemum	*canadense*	Wild Lily-of-the-valley	5	0		S5			G5												√					√		√																√								
Maianthemum	*racemosum*	False Solomon's Seal	4	3		S5			G5T	√										√	√			√	√	√		√	√	√			√	√								√	√	√							
Maianthemum	*stellatum*	Star-flowered Solomon's Seal	6	1		S5			G5		√	√	√															√		√																						
Polygonatum	*biflorum*	Hairy Solomon's Seal	8	3		S4			G5												√				√																			√								
Polygonatum	*pubescens*	Hairy Solomon's Seal	5	5		S5			G5																																											
Trillium	*erectum*	Purple Trillium	6	1		S5			G5												√			√					√																							
Trillium	*grandiflorum*	White Trillium	5	5		S5			G5												√			√	√	√		√					√	√																	
Trillium	*species*	Trillium species																						√					√																						
Uvularia	*grandiflora*	Large-flowered Bellwort	6	5		S5			G5	√																				√																						
Lemnaceae		**Duckweed Family**																																																		
Lemna	*minor*	Lesser Duckweed	2	-5		S5			G5																																											
Orchidaceae		**Orchid Family**																																																		
Epipactis	*helleborine*	Common Helleborine		5	-2	SE5			G?		√		√											√																													
Poaceae		**Grass Family**																																																		
Agrostis	*gigantea*	Red-top		0	-2	SE5			G4G5																																											
Agrostis	*stolonifera*	Redtop		-3		S5			G5																																										
Bromus	*inermis*	Smooth Brome		5	-3	SE5			G4G5T	IC						√	√																				√							IC								
Calamagrostis	*canadensis*	Blue-joint Grass	4	-5		S5			G5																																										
Cinna	*latifolia*	Broad-leaved Reed Grass	7	-4		S5			G5																																										
Dactylis	*glomerata*	Orchard Grass		3	-1	SE5			G?																																							√	√				√		
Echinochloa	*crusgalli*	Common Barnyard Grass		-3	-1	SE5			G?																																										
Elymus	*repens*	Quack Grass		3	-3	SE5			G?																																										
Elymus	*riparius*	River-bank Wild Rye	7	-3		S4?			G5																																										
Glyceria	*grandis*	Tall Manna Grass	5	-5		S4S5			G5																																										
Glyceria	*striata*	Fowl Meadow Grass	3	-5		S5			G5			√																							√			√	√		√										
Leersia	*oryzoides*	Rice Cut Grass	3	-5		S5			G5				√																								√	√													
Lolium	*arundinaceum*	Tall Fescue		2	-1	SE5			G?																																										
Oryzopsis	*asperifolia*	White-grained Mountain-rice	6	5		S5			G5																																										
Panicum	*capillare*	Witch Grass	0	0		S5			G5																																										
Panicum	*species*	Grass																																																	
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5			G5			√				√	√				√					√											√	√	√		√						√		√		√
Phleum	*pratense*	Timothy		3	-1	SE5			G?																												√															
Phragmites	*australis*	Common Reed	0	-4		S5			G5																													√														
Poa	*compressa*	Canada Blue Grass	0	2		S5			G?																													√														
Poa	*nemoralis*	Woodland Spear Grass		0	-1	SE3			G5																																											
Poa	*palustris*	Fowl Meadow Grass	5	-4		S5			G5																													√														
Poa	*pratensis ssp. pratensis*	Kentucky Bluegrass	0	1		S5			G5T												√				√																											
Poa	*species*	Grass Species																																																		
Setaria	*viridis*	Green Foxtail			-1	SE5			G?																																										
Setaria	*faberi*	Giant Foxtail		2	-1	SE4			G?																																										
Setaria	*pumila*	Yellow Foxtail		0	-1	SE5			G?								√																																		
Setaria	*species*	Foxtail																																																	

Appendix H. Plant Species List

Nextera - Bluewater Study Area

AECOM

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	510 BLW1049	510 BLW1010	510 BLW1679	510 BLW1010	512 BT3	512 BT3	514 BLW1656	514 BLW1658	514 BLW1658	BT1	518 BLW1056	518 BLW1056/1047	518 BLW1005	520_BT2	524 BLW1002	525 BLW1047	532 BLW1087	532 BLW1505	532 BLW1048/1087	534 BLW1069/ 1058	534 BLW1057	534 BLW1058/1069	534 BLW1645	534 BLW1647	537 BLW1086/1019	537 BLW1035/1019	539 BLW1478	541 BLW1508	541 BLW1065	541 BLW1065	541 BLW1065	542 BLW1029	542 BLW1029	544 BLW1510	545_BLW1479	BT4	BT4	BT4	BT5	BT5	BT12	BT13	BT13	BT13B
										510				512		514				518			520	524	525	532				534				537	539	541				542		544	545	551	552	553	555	556	561	562	563	564/565
			Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	FOD6-5	FOD5-1 SWD4	SWD3-3 FOD6-5	SWD2-2	SWC17 MAM2	FOD7	CUM1-1	MAM2-2	SWD3	SWD3 CUW1 FOD5	FOD5-2	CUM1-1	FOM3-2	FOD5	FOD5-1	FOD5-1	SWT2-5	FOD5-1	MAM2-10	FOD5-1	SWD3-3	SWD3-3	FOD7-2 SWD3	SWD3-3	FOD5-2 SWD3-3	FOD5-6	FOD7-4	FOD4-2 / SWT2-2 CUM1-1 / CUP2-1 FOD5-4 / SWD2-2 FOD5-1 / FOD5-6	MAM2-10	CUW1h	FOD7b	FOD7-1	SWD4	FOD5-2	FOD5-1	FOD5-2	FOM2	CUW1o	CUP3	FOD9-5	FOD5-5	FOD5 SWD3-3	FOD7-2 SWD4-2	CUP3	MAM2
Smilacaceae		**Catbrier Family**																																																		
Smilax	*herbacea*	Herbaceous Carrion Flower	5	0		S4			G5																					√																						
Typhaceae		**Cattail Family**																																																	
Typha	*angustifolia*	Narrow-leaved Cattail	3	-5		S5			G5						√																																				
Typha	*latifolia*	Broad-leaved Cattail	3	-5		S5			G5																														√			√											

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:		**351**	
Native Species:		**249**	70.94%
Exotic Species		**102**	29.06%
Total Taxa in Region (List Region, Source)		10000	
% Regional Taxa Recorded		3.51%	
Regionally Significant Species		0	
S1-S3 Species		1	
S4 Species		7	
S5 Species		234	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)		**4.39**	
CC 0 to 3	*lowest sensitivity*	76	30.52%
CC 4 to 6	*moderate sensitivity*	145	58.23%
CC 7 to 8	*high sensitivity*	28	11.24%
CC 9 to 10	*highest sensitivity*	0	0.00%
Floral Quality Index (FQI)		**69.27**	

Presence of Weedy & Invasive Species

mean weediness		**-1.67**	
weediness = -1	*low potential invasiveness*	53	51.96%
weediness = -2	*moderate potential invasiveness*	30	29.41%
weediness = -3	*high potential invasiveness*	19	18.63%

Presence of Wetland Species

average wetness value		**0.67**	
upland		90	25.64%
facultative upland		76	21.65%
facultative		50	14.25%
facultative wetland		70	19.94%
obligate wetland		50	14.25%

Appendix I

Breeding Bird Survey Data

Appendix I. Breeding Birds Survey Data

Common Name	Scientific Name	Status: National Species at Risk [a]	Status: Provincial Species at Risk [b]	Status: Provincially Significant SRANK [c]	Area Sensitive Species [d]	Natural Feature Number																																					
						504	426 427 429	541 544	541 544	532 541	532	532	532	518 525	518	508 518	508 518	498	498	490	490	481	481	463 480	463 480	542	542	524	524	524	510	510	510	510	492	492 510	483	483	470 471	433 437 439	437 439
						Visit 1	Visit 1	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 2	Visit 3	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 1	Visit 2	Visit 1	Visit 2	Visit 2	Visit 1	Visit 1	Visit 2	Visit 1	Visit 1	Visit 2
Great Blue Heron	*Ardea herodias*																																									
Green Heron	*Butorides virescens*																																									
Canada Goose	*Branta canadensis*																																									
Wood Duck	*Aix sponsa*																																									
Mallard	*Anas platyrhynchos*							1																																		
Turkey Vulture	*Cathartes aura*									1		1																1			7											1
Northern Harrier	*Circus cyaneus*				A					1																																
Cooper's Hawk	*Accipiter cooperi*				A																			1																		
Red-tailed Hawk	*Buteo jamaicensis*									1																												1	1			
Wild Turkey	*Meleagris gallopavo*																					1																				
Killdeer	*Charadrius vociferus*					1		1				1								1																						
Spotted Sandpiper	*Actitis macularia*					1																																				
Mourning Dove	*Zenaida macroura*								2					1						1	1			1																		
Black-billed Cuckoo	*Coccyzus erythropthalmus*									1																																
Eastern Screech-Owl	*Megascops asio*										1																		1													
Ruby-throated Hummingbird	*Archilochus colubris*																											1														
Yellow-bellied Sapsucker	*Sphyrapicus varius*				A																																					
Red-bellied Woodpecker	*Melanerpes carolinus*											1	2	1								1			2		1				1	1			1						
Downy Woodpecker	*Picoides pubescens*										1							1			2	1			2	1			1			1									
Hairy Woodpecker	*Picoides villosus*				A											2										1	1							1							
Northern Flicker	*Colaptes auratus*					1										1								1			1			1		1	1		1		1	1		
Pileated Woodpecker	*Dryocopus pileatus*				A																			1																	
Eastern Wood-Pewee	*Contopus virens*					1	1	1		1	1			1	4	1	2	1						2		2		1	1				1	1		1				1
Yellow-bellied Flycatcher [e]	*Empidonax flaviventris*															1										1														
Willow Flycatcher	*Empidonax traillii*																																								1
Least Flycatcher	*Empidonax minimus*				A																																				
Eastern Phoebe	*Sayornis phoebe*					1																																			
Great Crested Flycatcher	*Myiarchus crinitus*							1	1	1		1	2	1	1	3	1	2				1			1	3	1	1			1	2	1	1		2	2			2	1
Eastern Kingbird	*Tyrannus tyrannus*													1										1												1					1
Horned Lark	*Eremophila alpestris*						4						1	1					1	3				1		2	1			1								2			
Tree Swallow	*Tachycineta bicolor*						5		1																																
Bank Swallow	*Riparia riparia*									1																															
Cliff Swallow	*Petrochelidon pyrrhonota*																																								
Barn Swallow	*Hirundo rustica*	THR						1	1			2	4							1	1															2				
Blue Jay	*Cyanocitta cristata*							1	1					1	2	1	1	1	1			2				2		1								2		1		
American Crow	*Corvus brachyrhynchos*							1	1	1		1	1	1					2	1				1		2	1				1	1		2		1		1		
Black-capped Chickadee	*Poecile atricapillus*							1	1								2						1	1					1	2										
White-breasted Nuthatch	*Sitta carolinensis*				A																1												1						1	
House Wren	*Troglodytes aedon*							1	3		1		2	1	4	1	2					1	1		2		2	1	1	1	1	1	1	1			2	1		1	2
Blue-gray Gnatcatcher	*Polioptila caerulea*				A									1																										
Eastern Bluebird	*Sialia sialis*									1																															
Veery	*Catharus fuscescens*				A											1																									
Wood Thrush	*Hylocichla mustelina*					3		1						1	3	2	7	1	1			1		3	3		3				2	1	2		1	1	1			
American Robin	*Turdus migratorius*					2				1	1	1	1	3		2			1			4		1	3		1		1		1	2		1	1	1	3	1	1	
Gray Catbird	*Dumetella carolinensis*						1		3					1								1		1	1									1	1			1		1	1
Brown Thrasher	*Toxostoma rufum*							1																1																1	
Cedar Waxwing	*Bombycilla cedrorum*								2			1		5		2					2		1	1	5		1	2		1		1		1		1	4		2	1	
European Starling	*Sturnus vulgaris*																																6				4				
Yellow-throated Vireo	*Vireo flavifrons*				A																				1																
Warbling Vireo	*Vireo gilvus*																														1	1	1	1			3			1	2
Red-eyed Vireo	*Vireo olivaceus*					1			3		1		1	1	3	4	2	1	1			1	3			2	1	2	1					1		1	1	1		2
Yellow Warbler	*Dendroica petechia*							1	1					1																							3			1	4
Chestnut-sided Warbler	*Dendroica pensylvanica*													1																										
American Redstart	*Setophaga ruticilla*				A	1								1												1					1	1				2				
Ovenbird	*Seiurus aurocapillus*				A	2		2		1					3		2					1										1	1							
Mourning Warbler	*Oporornis philadelphia*					2																																			
Common Yellowthroat	*Geothlypis trichas*					1		2	3					1										2												1				1
Scarlet Tanager	*Piranga olivacea*				A											2	1	1																						
Northern Cardinal	*Cardinalis cardinalis*											1		1									1																		
Rose-breasted Grosbeak	*Pheucticus ludovicianus*					2		1						3		5	1	1				1		1	2	2				1	2	2	2		2	1	1			2
Indigo Bunting	*Passerina cyanea*					1		1	2	1	2		2	2	6		6		1			1	2	3			2		2	1		1		1		2	2	1	1		1
Eastern Towhee	*Pipilio erythrophthalmus*																																								
Chipping Sparrow	*Spizella passerina*					1						1								1				1								1					1	1		
Clay-colored Sparrow	*Spizella pallida*																																								
Field Sparrow	*Spizella pusilla*							1	1			1	2							1																		1			
Vesper Sparrow	*Pooecetes gramineus*					1		1		2	1		2	1				1								1	2	1	1	1		1			1	1	1				
Savannah Sparrow	*Passerculus sandwichensis*				A			4	5	2		2	10	2						2	1				2		1			1		1				1		3	3	
Grasshopper Sparrow	*Ammodramus savannarum*				A			1	10				1																											
Song Sparrow	*Melospiza melodia*							3	3	1	2	2	9	1	6		5		2	4	3	1	1	3	1	1	2	2	2	1	1	2	1	2	1	2		3	5	1	7
Red-winged Blackbird	*Agelaius phoeniceus*						1	2	3		1	7	17	2	2		1			1				1				1		2	1					2		3	3	3
Eastern Meadowlark	*Sturnella magna*	THR			A																				1														2	
Common Grackle	*Quiscalus quiscula*																					1		1			1													
Brown-headed Cowbird	*Molothrus ater*					1		1						2								2	1	1	2	1				1	1	2		1		1	3	1	1	3
Baltimore Oriole	*Icterus galbula*							1	1	2	1	1				2						1			5	1		1	1		1	2		2			3			
American Goldfinch	*Cardeulis tristis*							1	1						2	2		1			6	2		2	1	1								1		1	3		1		
Number of Species:						17	5	25	21	16	11	9	17	25	17	10	18	10	10	10	7	18	8	18	21	15	17	11	11	10	13	18	12	20	3	15	22	14	12	16	15
Number of Individuals						23	12	33	49	19	13	18	56	32	50	19	45	11	12	16	16	24	11	26	40	22	24	14	13	10	21	25	13	30	3	20	44	18	22	24	30

Number of National Species at Risk: 2
Number of Provincial Species at Risk: 0
Number of S1 to S3 (provincially significant) Species: 0
Number of regionally significant OWES species (6):
Number of regionally significant OWES species (7):

KEY
a National Species at Risk are those listed by COSEWIC = Committee on the Status of Endangered Wildlife in Canada: END = Endangered, THR = Threatened, SC = Special Concern
b 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
c SRANK (from Natural Heritage Information Centre) shown only if: S1 (Critically Imperiled), S2 (Imperiled) or S3 (Vulnerable); not shown if: S4 (apparently secure, uncommon), S5 (secure, common).
d Area Sensitive Species according to OMNR (2000) Significant Wildlife Habitat Technical Guide (Appendix G)
e Late Migrant, Non-breeding

Appendix I. Breeding Birds Survey Data

Common Name	Scientific Name	Status			Area Sensitive Species [d]	Natural Feature Number																				
		National Species at Risk [a]	Provincial Species at Risk [b]	Provincially Significant SRANK [c]		534	477 488	477 488	515 523	534	468 476	476	468	468	468	463	463	463	450 463	457	457	480	480	463	463	510	510
						Visit 1	Visit 1	Visit 2	Visit 1	Visit 1	Visit 1	Visit 2	Visit 1	Visit 2	Visit 3	Visit 1	Visit 2	Visit 3	Visit 1	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 2	Visit 1
Great Blue Heron	*Ardea herodias*																				1						
Green Heron	*Butorides virescens*																			1							
Canada Goose	*Branta canadensis*																										
Wood Duck	*Aix sponsa*							9								1											
Mallard	*Anas platyrhynchos*												1														
Turkey Vulture	*Cathartes aura*						1						4														
Northern Harrier	*Circus cyaneus*				A																						
Cooper's Hawk	*Accipiter cooperi*				A																						
Red-tailed Hawk	*Buteo jamaicensis*							1					1									1					
Wild Turkey	*Meleagris gallopavo*							2													1						
Killdeer	*Charadrius vociferus*																										
Spotted Sandpiper	*Actitis macularia*												1														
Mourning Dove	*Zenaida macroura*								2							1				1		1	1				
Black-billed Cuckoo	*Coccyzus erythropthalmus*																				1						
Eastern Screech-Owl	*Megascops asio*																										
Ruby-throated Hummingbird	*Archilochus colubris*																										
Yellow-bellied Sapsucker	*Sphyrapicus varius*				A											1											
Red-bellied Woodpecker	*Melanerpes carolinus*																							1			
Downy Woodpecker	*Picoides pubescens*									1		1															
Hairy Woodpecker	*Picoides villosus*				A									1													
Northern Flicker	*Colaptes auratus*					1	1			1	1		1	1	1	1	1					1	1	2			
Pileated Woodpecker	*Dryocopus pileatus*				A						1				1												
Eastern Wood-Pewee	*Contopus virens*							1		1	1	1	1	1		2	1				1			1	1	1	
Yellow-bellied Flycatcher [e]	*Empidonax flaviventris*																										
Willow Flycatcher	*Empidonax traillii*						1	1	1													2	1	1	1		
Least Flycatcher	*Empidonax minimus*				A																				1	1	
Eastern Phoebe	*Sayornis phoebe*																										
Great Crested Flycatcher	*Myiarchus crinitus*									1	1	1		1	1	1	1		2						1	1	1
Eastern Kingbird	*Tyrannus tyrannus*						2						1						1			1					1
Horned Lark	*Eremophila alpestris*						1		2			1	1	1				1	3	1			1					
Tree Swallow	*Tachycineta bicolor*							1	1								1							1			
Bank Swallow	*Riparia riparia*												1														
Cliff Swallow	*Petrochelidon pyrrhonota*												1														
Barn Swallow	*Hirundo rustica*	THR					2						18								2		2				
Blue Jay	*Cyanocitta cristata*										2	1			1				1			1					
American Crow	*Corvus brachyrhynchos*					2	3	1	2	2				1	1	2	1			2		1	2				2
Black-capped Chickadee	*Poecile atricapillus*					1								1								1					
White-breasted Nuthatch	*Sitta carolinensis*				A	1									1												1
House Wren	*Troglodytes aedon*					1		2		3	2	2		2	2		1	3	5		1	1		1	3	5	2
Blue-gray Gnatcatcher	*Polioptila caerulea*				A																						
Eastern Bluebird	*Sialia sialis*																										
Veery	*Catharus fuscescens*				A																						
Wood Thrush	*Hylocichla mustelina*					1		2	1	2	1		2	1	3	2	1		1	1		2	3	1	2	6	2
American Robin	*Turdus migratorius*					2	1		2	2	1	1	1		1	1	1	1	1	1		2		2		2	2
Gray Catbird	*Dumetella carolinensis*						1	2	1	1										2	1	1	1		1	1	1
Brown Thrasher	*Toxostoma rufum*						1	1	1							1					1						
Cedar Waxwing	*Bombycilla cedrorum*					1		3	2	1	1				1	2	1				2	1	3	1	2		1
European Starling	*Sturnus vulgaris*																										
Yellow-throated Vireo	*Vireo flavifrons*				A																						
Warbling Vireo	*Vireo gilvus*							1		1																1	
Red-eyed Vireo	*Vireo olivaceus*					1				4	2	1	2	2	1	3	1	1	2	1	1	1				2	1
Yellow Warbler	*Dendroica petechia*						2					1				1					1		2				1
Chestnut-sided Warbler	*Dendroica pensylvanica*																										
American Redstart	*Setophaga ruticilla*				A																					3	1
Ovenbird	*Seiurus aurocapillus*				A					2									2								
Mourning Warbler	*Oporornis philadelphia*						1																				
Common Yellowthroat	*Geothlypis trichas*						1	2		1												2	2	1	1		
Scarlet Tanager	*Piranga olivacea*				A																						
Northern Cardinal	*Cardinalis cardinalis*																				1						
Rose-breasted Grosbeak	*Pheucticus ludovicianus*					1		2	2	2	2			2	1		1				1	3		3	2	5	1
Indigo Bunting	*Passerina cyanea*					1	1	1	1	3	2	1	1	3	2	1		1	2		2	4	2	2	3		1
Eastern Towhee	*Pipilio erythrophthalmus*																				1						
Chipping Sparrow	*Spizella passerina*						1		1														1				
Clay-colored Sparrow	*Spizella pallida*																						2				
Field Sparrow	*Spizella pusilla*						1	1														1	2				
Vesper Sparrow	*Pooecetes gramineus*					1	3				1			1		1			1	1			1				
Savannah Sparrow	*Passerculus sandwichensis*				A	1			1		2	2		1		1			2			1	1	2	1	1	
Grasshopper Sparrow	*Ammodramus savannarum*				A																						
Song Sparrow	*Melospiza melodia*					2	2	7	4	3	1	4	1	2	1	1		5	2	3	6	5	3	3	5		1
Red-winged Blackbird	*Agelaius phoeniceus*					1		2		2			1			2			1		7	1		2			
Eastern Meadowlark	*Sturnella magna*	THR			A														1								
Common Grackle	*Quiscalus quiscula*					1		30														1			1		
Brown-headed Cowbird	*Molothrus ater*					2	9		2	3	2		1		1	1				1	2	2	3	1		1	2
Baltimore Oriole	*Icterus galbula*					1				2	1					1			1		1			1		1	1
American Goldfinch	*Cardeulis tristis*							1	1	1			1			2		3		1	1	1	2	2	3	1	
Number of Species:						18	19	21	17	21	17	12	19	15	15	21	11	7	16	12	20	24	20	18	13	16	18
Number of Individuals						22	35	73	27	39	24	17	41	21	19	29	11	15	28	16	35	38	36	28	26	33	23

Number of National Species at Risk: 2 *Number of regionally significant OWES species (6):*
Number of Provincial Species at Risk: 0 *Number of regionally significant OWES species (7):*
Number of S1 to S3 (provincially significant) Species: 0

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AECOM