







**Canada-United States-Ontario-Michigan Border Transportation Partnership** 

# Draft **Practical Alternatives Evaluation Working Paper**

**Natural Heritage** 

Draft April 2008

## **EXECUTIVE SUMMARY**

Assessing the project impacts on natural heritage features such as fisheries, vegetation, wildlife and designated natural areas is an important part of the Detroit River International Crossing (DRIC) Environmental Assessment. The analysis of natural heritage features entailed collection and review of existing information, personal communications with local experts and detailed, multi-season field investigations. An area of investigation (AOI) located within the area of continued analysis (ACA) was defined for each biological discipline based on the potential for displacement or disturbance effects associated with the undertaking.

#### **VEGETATION AND VEGETATION COMMUNITIES**

The DRIC study team investigated all vegetation communities located within the AOI to classify vegetation communities, inventory plants and confirm the presence/absence of species at risk.

#### How the Analysis was Done

Background information was obtained from the Ministry of Natural Resources (MNR), Essex Region Conservation Authority (ERCA) and local field naturalists. Field investigations were performed in April, May, June, July, August and October 2006, throughout the growing season. Vegetation communities were delineated on air photos and refined through ground truthing. The Ecological Land Classification (ELC) system was used to describe vegetation communities.

A plant survey was conducted in each vegetation community to identify composition, structure and function. Representative photographs were taken. Species at risk were identified in the field where possible or photographs or samples were taken for identification or verification purposes. The locations of species at risk were recorded using a Global Positioning System (GPS), where possible.

#### **Results**

Nine types of vegetation communities located in the AOI are considered provincially or globally rare. A total of 618 species of vascular plants were identified, 63 of which are considered provincially rare. Eight plant species are regulated as Endangered, Threatened or Special Concern in the schedules to the *Species at Risk Act* (SARA) and seven plant species are regulated as Endangered, Threatened or Special Concern in the schedules to the new Ontario *Endangered Species Act* (OESA).

#### MOLLUSCS AND INSECTS

The DRIC study team screened the AOI and its vicinity for the presence/absence of rare molluscs and insects.

#### How the Analysis was Done

Secondary source data on molluscs and insects of the Windsor area was collected through literature searches, review of databases and personal communications with local experts. Background data collected was reviewed and compiled into two databases (molluscs and insects). The scope of the investigation was limited to provincially rare species.

#### Results

Currently ten species of molluscs, including two classes of Mollusc phyla, the Mussels (Bivalves) and the Snails (Gastropods) are regulated as Endangered or Threatened in the schedules to SARA and the new OESA. There is the potential that these species may occur in the AOI, but no comprehensive field investigations have been conducted of the Windsor area. Several of these species likely occurred in the Detroit River historically. Data obtained from the MNR indicates that nine rare species of Bivalves and two rare species of Gastropods occur in the vicinity of the AOI.

Over 2055 species of insects have been reported from the Ojibway Prairie Complex. The Ojibway Prairie Complex and its vicinity is the only site for 16 Canadian species and 6 Ontario species records. It is one of a few sites for 37 Canada species and 29 Ontario species records. The insect, *Loxocera ojibwayensis*, is a small Psilidae fly (Diptera) that was discovered at the Ojibway Prairie, and it is the only known site in the world for this species. One-hundred-and-thirteen important species are known from the Ojibway Prairie Complex and its vicinity and an additional seven species of dragonflies (Odonata) potentially occur there as well. These 113 species are broken up into one species of Diptera (true flies), 22 species of Auchenorrhyncha Hemiptera (hoppers), 13 species of Heteroptera Hemiptera (true bugs), 41 species of Hymenoptera (bees and wasps), 17 species of Lepidoptera (moths and butterflies), 13 species of Odonata (damselflies and dragonflies), and six species of Orthoptera (grasshoppers, crickets and katydids). The Monarch is known to occur in the AOI and its vicinity; and it is regulated as Special Concern in Schedule 1 of SARA and Schedule 5 of the new OESA.

#### FISH AND FISH HABITAT

The DRIC study team investigated all watercourses and waterbodies located within the AOI to confirm the presence/absence of fish and fish habitat and species at risk.

#### How the Analysis was Done

Background information was obtained from the Department of Fisheries and Oceans Canada (DFO), MNR and ERCA. Field investigations were performed in May, September and October 2006. The fish community was investigated at 58 stations using backpack electrofishing equipment, minnow traps, dip nets or through direct observation. Fish habitat along 38 watercourse reaches was characterized and photographed. The Detroit River bed in the vicinity of the proposed piers was also videotaped using underwater video camera and sediment was sampled.

#### Results

Most watercourses in the AOI are designated as agricultural municipal drains and are altered by agricultural or urban development. No watercourses or waterbodies in the AOI support coolwater or coldwater fish communities, with the exception of the Detroit River. Turkey Creek, Lennon Drain, McKee Creek and Cahill Drain directly support warmwater sportfish communities (i.e. bass, sunfish, etc.). Remaining fish habitat supports warmwater baitfish communities (i.e. minnows, chubs, etc.). Many watercourses function as municipal agricultural drains and do not directly support fish habitat. No critical fish habitat or fish species at risk were identified in inland watercourses. Eight fish species are regulated as Endangered, Threatened or Special Concern in the schedules to the new OESA; however, no specialized habitat for species at risk is located in the vicinity of this project.

#### WILDLIFE AND WILDLIFE HABITAT

The DRIC study team investigated all wildlife habitats located in the AOI to identify important habitat for wildlife, inventory wildlife and confirm the presence/absence of species at risk.

#### How the Analysis was Done

Background information was obtained from the MNR, ERCA and local field naturalists. Field investigations were performed in March, April, May, June, July, August, September, October and November 2006 and February 2007. Wildlife habitat was delineated on air photos and refined through ground truthing. ELC was used to describe wildlife habitat, where appropriate.

Wildlife was identified through direct observation, vocalizations, tracks, scats and browse. One hundred and twenty point-count breeding bird surveys were performed at 60 stations. Species at risk were identified in the field and a photograph was taken for verification purposes. The locations of species at risk were recorded using a GPS, where possible.

#### Results

One hundred and twenty-four wildlife habitat units were identified in the AOI, many of which meet the criteria for "significance" in Ontario. A total of 139 wildlife species were recorded in the AOI including 11 reptiles and amphibians, 108 birds and 20 mammals. Breeding bird surveys identified a total of 50 species of breeding birds in the AOI. Redheaded Woodpecker, regulated as Special Concern in Schedule 3 of SARA and Schedule 5 of the new OESA, was confirmed breeding in the Brighton Beach area. Golden-winged Warbler, regulated as Special Concern in Schedule 3 of SARA and Schedule 5 of the new OESA, was confirmed breeding in the Brighton Beach area. Golden-winged Warbler, regulated as Special Concern in Schedule 3 of SARA and Schedule 5 of the new OESA, was confirmed breeding in the AOI. Three eastern foxsnake and four Butler's gartersnake were recorded in the AOI. Both species are regulated as Threatened in Schedule 1 of SARA and Schedule 4 of the new OESA. Other Threatened, Schedule 1 SARA species known to occur in the Ojibway Prairie Complex, including eastern massasauga and eastern hog-nose snake, were not recorded in the AOI.

#### DESIGNATED NATURAL AREAS

The DRIC study team investigated all designated natural areas in the AOI and its vicinity.

#### How the Analysis was Done

Secondary source information on Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands (PSW), Environmentally Sensitive Areas (ESA), Provincial Nature Reserves, Candidate Natural Heritage Sites (CNHS), Carolinian Canada sites, Canadian Heritage Rivers and municipal land use designations was collected and reviewed to identify the location and type of designated natural areas.

#### <u>Results</u>

The Ojibway Prairie Provincial Nature Reserve is a 65 ha parcel that is regulated under the Provincial Parks Act to protect one of the largest remnants of tallgrass prairie and oak savannah in Ontario. The Ojibway Prairie Complex is a provincially significant life science ANSI that is comprised of the following areas: Ojibway Prairie Provincial Nature Reserve; Ojibway Park; Titcombe Road North; Spring Garden Road; Black Oak Woods; and, Prairie Remnants (Southeast of Nature Reserve). A total of five ESAs are located in the AOI and its vicinity including: Ojibway Prairie Complex (#3); Sandwich West Woodlot/Lasalle Woods (#18); Ojibway Black Oak Woods (#19); Spring Garden Road Prairie (#29); and, St. Clair College Prairie (#49). Three areas are designated as Natural Environment by the Town of LaSalle Official Plan, including: Southeast of the Nature Reserve ANSI; the Spring Garden Forest ANSI; and, the LaSalle Woods. Three areas are designated as Natural Heritage by the City of Windsor Official Plan, including: Ojibway Prairie Complex; Oakwood Bush and the eastern section of Malden Park; and, three areas are designated as Special Policy Area "A" including two areas of the Titcombe Road North ANSI, a section of the Spring Garden Forest ANSI and the St. Clair College Prairie ESA. A total of three CNHSs are identified in LaSalle and ten CNHSs are identified in Windsor. There are no PSWs located in the AOI. The Detroit River is designated as a Canadian Heritage River.

#### **EVALUATION OF PRACTICAL ALTERNATIVES**

The natural heritage discipline conducted an evaluation of seven crossing and plaza combinations and 20 access road combinations. The evaluation was conducted using five criteria:

- Impacts to ecological landscapes located in the right-of-way (ROW);
- Impacts to terrestrial communities/ecosystems located in the ROW;
- Impacts to aquatic communities/ecosystems located in the ROW;
- Impacts to species/populations at risk located in the ROW; and,
- Impacts to designated natural areas located on adjacent lands within 120 metres of the ROW.

Indicators were used, where appropriate, to measure the number, area, type and significance of natural heritage features.

An arithmetic evaluation was conducted using the simple additive weighting method. Weights were assigned to criteria and indicators to reflect their level of importance. The results of the arithmetic evaluation were reviewed against the original data to ensure that the numerical results could be supported through reasoned argument. The evaluation of

the practical alternatives using natural heritage criteria resulted in the identification of preferred plazas, crossings and access roads.

#### Plazas and Crossings

- The most preferred crossing and plaza is Crossing C to Plaza C. Crossing C to Plaza C is most preferred because it avoids the natural heritage features associated with the Brighton Beach area and the area north of Chappus Road. Crossing A to Plaza A is least preferred because it will displace natural heritage features located in the Brighton Beach area and the area north of Chappus Road.
- Plaza B1 from Crossing C has the greatest potential to disturb designated natural heritage features located on adjacent lands, due to its close proximity to the Black Oak Woods ANSI/ESA.
- The alternatives involving Plaza A are least preferred, with the exception of Plaza A from Crossing C through C-G (Ojibway Parkway) which is the second most preferred alternative because it avoids the Brighton Beach area.
- An impact score of "3" (low impact) was assigned to Crossing C to Plaza C; an impact score of "2" (moderate impact) was assigned to Crossing C to Plaza A through C-G, Crossing C to Plaza B and Crossing B to Plaza B1; and, an impact score of "1" (high impact) was assigned to Crossing C to Plaza A through C-E-G, Crossing B to Plaza A and Crossing A to Plaza A.

#### Access Roads

- There is no significant difference among access roads based on vertical profile (i.e. at grade (Alternative 1A and 2A), depressed (Alternative 1B and 2B), tunnel (Alternative 3) or depressed with short tunnels (Parkway)). Each access road alternative has its own advantages and disadvantages.
- All access roads that connect Plazas B or C with the existing Highway 401 are preferred to their counterparts that connect Plaza A with the existing Highway 401 because they result in less displacement of rare vegetation communities in the Malden Road area.
- An impact score of "3" (low impact) was assigned to all access roads that connect Plazas B or C with the existing Highway 401 and an impact score of "2" (moderate impact) was assigned to all access roads that connect Plaza A with the existing Highway 401.

#### Environmental Protection Measures

All crossings, plazas and access roads will result in the displacement of provincially rare vegetation communities, wildlife habitat and species at risk. Since total avoidance cannot be achieved, environmental protection measures will be required to address the impacts of displacement and disturbance on natural heritage features.

#### **Provincially Rare Vegetation Communities**

The goal of the DRIC study team is to maintain no net loss of the area or function of provincially rare vegetation communities, including tallgrass prairies. Several mitigation strategies are available to compensate for the loss of provincially rare vegetation

communities including, in order of preference: enhance existing natural remnants; enlarge existing natural remnants; and, establish new tallgrass prairie communities.

#### Species at Risk

The proposed facility will result in the loss of plant and animal species and their habitat that are provincially rare, listed by COSEWIC and COSSARO, or regulated under SARA or the new OESA. The DRIC study team will consider opportunities to avoid, integrate, or salvage and relocate plant species at risk to the extent possible. The success rate for capture and relocation of Butler's gartersnake or eastern foxsnake is unknown. Management strategies for species at risk will be discussed with regulatory agencies and will comply with species at risk legislation.

#### Groundwater

Groundwater is known to play an important role in sustaining tallgrass prairie communities. The tallgrass prairie communities are sustained by the surficial sand, silt and fill layer (surface aquifer) that is saturated by rainfall. Creating permanent, open, and depressed highways within the native clays using slopes or supported with retaining walls (that do not cut off groundwater pressure gradients from adjacent higher grades) will result in a permanent lowering of the groundwater level within the clay soils. It is anticipated that if low permeability in situ walls (e.g. contiguous caisson walls or concrete diaphragm walls) are used for excavation support or for permanent below grade structures, that the influence of the excavation on near-surface groundwater would be minimal. As a result, no changes to the composition or structure of the tallgrass prairies are anticipated if cut-off walls are used.

#### Surface Water

A depressed or tunnel highway profile along the access roads will require alteration of surface water features through diversion, enclosure, siphoning or aquaducting depending on the characteristics of the watercourse and the depth of the highway below existing grades. Any harmful alteration of these watercourses is subject to the requirements of the *Fisheries Act*. Since none of these watercourses directly support critical fish habitat, the full suite of environmental protection options, including fish habitat compensation to maintain no net loss of the productive capacity of fish habitat, are available.

#### **REMAINING ACTIVITIES**

The evaluation of crossings, plazas and access roads by the natural heritage discipline will be incorporated into the multi-disciplinary evaluation of practical alternatives. A site-specific impact assessment will be performed and environmental protection measures will be identified once a technically preferred alternative is selected. No additional field investigations are proposed for the practical alternatives stage.

## PREFACE

The Detroit River International Crossing (DRIC) Environmental Assessment Study is being conducted by a partnership of the federal, state and provincial governments in Canada and the United States in accordance with the requirements of the *Canadian Environmental Assessment Act* (CEAA), the *Ontario Environmental Assessment Act* (OEAA), and the U.S. *National Environmental Policy Act* (NEPA). In 2006, the Canadian and U.S. Study Teams completed an assessment of illustrative crossing, plaza and access road alternatives. This assessment is documented in two reports: *Generation and Assessment of Illustrative Alternatives Report - Draft (November 2006)* (Canadian side) and *Evaluation of Illustrative Alternatives Report (December 2006)* (U.S. side). The results of this assessment led to the identification of an Area of Continued Analysis (ACA) as shown in Exhibit 1.

Within the ACA, practical alternatives were developed for the crossings, plazas and access routes alternatives. The evaluation of practical crossing, plaza and access route alternatives is based on the following seven factors:

- Changes to Air Quality
- Protection of Community and Neighbourhood Characteristics
- Consistency with Existing and Planned Land Use
- Protection of Cultural Resources
- Protection of the Natural Environment
- Improvements to Regional Mobility
- Cost and Constructability

This report pertains to the Protection of the Natural Environment factor and is one of several reports that will be used in support of the evaluation of practical alternatives and the selection of the technically and environmentally preferred alternative. This report will form a part of the environmental assessment documentation for this study.

Additional documentation pertaining to the evaluation of practical alternatives is available for viewing/downloading at the study website (www.partnershipborderstudy.com).

# Draft Practical Alternatives Evaluation Working Paper

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### 1.0

### INTRODUCTION

The Ontario *Environmental Assessment Act* (OEAA) and the *Canadian Environmental Assessment Act* (CEAA) require assessment of all aspects of a project on the environment. The role of the natural heritage discipline in the Detroit River International Crossing Study is to assess the environmental effects of crossings, plazas and access roads on the biophysical environment. Input is provided during site and route selection, preliminary design, detail design and construction to avoid, minimize or mitigate the potential effects of the project on natural heritage.

"Protection of the natural environment" is one of seven factors being used to evaluate practical alternatives in the Detroit River International Crossing Study. This Working Paper presents the data and analysis of the practical alternatives, as it pertains to natural heritage, and provides a starting point to assess the environmental effects of the technically preferred alternative. Additional work will be undertaken later in the study to complete the assessment of effects, and to identify mitigation measures that may be required to eliminate or reduce the effects. This additional work, together with the information in this report, will also lay the foundation for meeting the requirements of CEAA. The specific requirements of CEAA, and the manner in which these requirements are being coordinated in this study, are outlined in the Federal Environmental Assessment Guidelines that have been prepared for this project and are available on the project website.

Natural heritage is defined in Ontario as:

"features and areas, including significant wetlands, significant coastal wetlands, fish habitat, significant woodlands, significant valleylands, significant habitat of endangered and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscapes of an area" (OMMAH 2005).

The natural heritage discipline is guided by government legislation, regulations, policies and guidelines within federal, provincial and municipal jurisdictions. The major impetus for the natural heritage investigation includes:

- Canadian Biodiversity Strategy;
- Canada Fisheries Act;
- Canada Species at Risk Act;
- Canada *Migratory Birds Convention Act;*
- Canada Wildlife Act;
- Canadian Federal Policy on Wetland Conservation;
- Ontario Biodiversity Strategy;
- Ontario Endangered Species Act;
- Ontario Fish and Wildlife Conservation Act;
- Ontario Water Resources Act;
- Ontario *Planning Act* and the *Provincial Policy Statement;*

- Ontario Conservation Authorities Act; and
- Implementation Strategy: Areas of Natural and Scientific Interest.

As outlined in the Natural Heritage Work Plan (Border Transportation Partnership 2005), consideration of natural heritage is incorporated into all four stages of the site and route selection process. The purpose of natural heritage input at each step is described below.

#### Preliminary Analysis Area

To profile the natural heritage areas and features located in the Preliminary Analysis Area and identify opportunities for and constraints to facility siting.

#### **Illustrative Alternatives**

To evaluate on a comparative basis the natural heritage areas and features influenced by illustrative alternatives, including crossings, plazas and access roads to contribute to the identification of practical alternatives.

#### **Practical Alternatives**

To evaluate on a comparative basis the natural heritage areas and features influenced by practical alternatives including crossings, plazas and access roads to contribute to the identification of conceptual alternatives.

#### **Conceptual Alternatives**

To evaluate on a comparative basis the natural heritage areas and features influenced by conceptual alternatives including crossings, plazas and access roads to contribute to the identification of the technically preferred alternative.

The natural heritage discipline also assesses the significant adverse effects of the technically preferred alternative on natural heritage and identifies environmental protection measures.

At each stage of the study process, similar tasks occur. These tasks include:

#### Task 1 – Define Area of Investigation

Identify the study area for the purposes of investigating the potential effects of the project.

#### Task 2 – Data Collection

Identify the type, source, level of detail and methods to be used to obtain information.

#### Task 3 – Data Analysis

Identify how the information will be interpreted to determine the significance and sensitivity of natural heritage features.

#### Task 4 – Evaluate Alternatives

Identify the natural heritage criteria and indicators that will be used to compare alternatives.

#### Task 5 – Conduct Impact Assessment

Identify the range of potential environmental effects to be assessed.

#### Task 6 – Recommend Environmental Protection Measures

Identify the range of potential environmental protection measures to be assessed. Environmental protection measures typically include avoidance, minimization, mitigation, compensation and monitoring.

These tasks are summarized for each stage of the study process in Table 1. This Practical Alternatives Evaluation Working Paper presents the results of each task of the natural heritage investigation for the evaluation of practical alternatives.

Task 2, Data Collection, identified in Table 1 was revised for the evaluation of practical alternatives. The original approach was to conduct preliminary, single-season pedestrian surveys for each practical alternative and detailed, multi-season pedestrian surveys for each conceptual alternative. However, to accommodate an entire year of field investigations within the project schedule, detailed, multi-season pedestrian surveys were performed at the practical alternatives stage. This modification had no influence on the natural heritage investigation other than a much broader area was investigated at a greater level of detail than originally anticipated.

Study Stage <sup>1</sup>	Ecological Analysis Level	Task 1 Define Area of Investigation	Task 2 Data Collection	Task 3 Data Analysis	Task 4 Evaluate Alternatives	Task 5 Impact Assessment	Task 6 Environmental Protection Measures
Stage 1 – Define Study Area	Ecodistrict - 1:250,000 scale	Preliminary Analysis Area	<ul><li>Secondary source</li><li>Air photo interpretation</li></ul>	Identify designated/ regulated natural heritage features to determine national, provincial, regional and local significance.	• Avoid, where feasible, designated/regulated natural heritage features located within Preliminary Analysis Area.	Opportunities/ Constraints Analysis	Avoidance
Stage 2 – Ilustrative Alternatives	Ecosection - 1:100,000 scale	Illustrative routes, plazas, plaza extensions and crossings rights-of-way, footprints and adjacent zones of influence	<ul> <li>Secondary source</li> <li>Air photo interpretation</li> <li>Windshield/ aerial surveys</li> </ul>	Identify designated/ regulated natural heritage features to determine national, provincial, regional and local significance.	<ul> <li>Compare potential loss of designated/regulated natural heritage features located within rights-of-way and footprint areas (extent, significance).</li> <li>Compare potential disturbance to designated/regulated natural heritage features located within adjacent zones of influence (extent, significance).</li> </ul>	Opportunities/ Constraints Analysis	Avoidance
Stage 3 – Practical Alternatives	Ecosite - 1:10,000 scale	Practical routes, plazas, plaza extensions and crossings rights- of-way, footprints and adjacent zones of influence	<ul> <li>Secondary source</li> <li>Air photo interpretation</li> <li>Preliminary single season pedestrian surveys</li> </ul>	Identify landscapes, ecosystems/communities and populations/species to determine national, provincial, regional and local significance and sensitivity to impacts.	<ul> <li>Compare potential loss of terrestrial and aquatic landscapes, ecosystems/communities and populations/species located within rights-of-way and footprint areas (extent, type, significance, sensitivity).</li> <li>Compare potential disturbance to terrestrial and aquatic landscapes, ecosystems/communities and populations/species located within adjacent zones of influence (extent, type, significance, sensitivity).</li> </ul>	Generic Impacts	<ul> <li>Avoidance</li> <li>Minimization</li> <li>Generic mitigation</li> </ul>

### TABLE 1. NATURAL HERITAGE INVESTIGATION BY STUDY STAGE

Study Stage <sup>1</sup>	Ecological Analysis Level	Task 1 Define Area of Investigation	Task 2 Data Collection	Task 3 Data Analysis	Task 4 Evaluate Alternatives	Task 5 Impact Assessment	Task 6 Environmental Protection Measures
Stage 4 – Concept Design Alternatives	Ecoelement - 1:1,000 scale	Concept design routes, plazas, plaza extensions and crossings rights-of-way, footprints and adjacent zones of influence	<ul> <li>Secondary source</li> <li>Air photo interpretation</li> <li>Detailed multi- season pedestrian surveys</li> </ul>	Identify landscapes, ecosystems/communities and populations/species to determine national, provincial, regional and local significance and sensitivity to impacts.	<ul> <li>Compare potential loss of terrestrial and aquatic landscapes, ecosystems/communities and populations/species located within rights-of-way and footprint areas (extent, type, significance, sensitivity).</li> <li>Compare potential disturbance to terrestrial and aquatic landscapes, ecosystems/communities and populations/species located within adjacent zones of influence (extent, type, significance, sensitivity).</li> </ul>	Conceptual Site-Specific Impacts	<ul> <li>Avoidance</li> <li>Minimization</li> <li>Conceptual site-specific mitigation, compensation and monitoring</li> </ul>

### TABLE 1. NATURAL HERITAGE INVESTIGATION BY STUDY STAGE

<sup>1</sup> Detail Design is not currently included in the Detroit River International Crossing Route Planning and Environmental Assessment Study

# 2.0 PRACTICAL ALTERNATIVES

A total of three crossings, three plazas and six access roads were generated within the Area of Continued Analysis (ACA). A variation on Plaza B was generated and identified as Plaza B1. The combination of crossings and plazas resulted in the generation of seven potential crossing and plaza alternatives. A number of variations on access roads were also generated resulting in a total of 20 potential access roads to connect existing Highway 401 with Plazas A, B/B1 and C. The ACA is presented in Figure 1.





# Area of Investigation

The area of investigation (AOI) is specific to each biological discipline (i.e. vegetation, fisheries, wildlife, etc.) and is based on the level of detail of secondary source information, the area of influence of the project and the level of effort required for field investigations.

2.1.1

2.1

# Vegetation and Vegetation Communities

The AOI for vegetation and vegetation communities includes all lands located within the maximum footprint area of the combined practical alternatives and adjacent lands located within 120 m of the right-of-way. This area corresponds approximately with the ACA.

## 2.1.2 Molluscs and Insects

The AOI for molluscs and insects includes the ACA and its vicinity.

# 2.1.3 Fish and Fish Habitat

The AOI for fish and fish habitat includes the ACA. Benthic invertebrates were surveyed at several stations located within the ACA and its vicinity.

### 2.1.4 Wildlife and Wildlife Habitat

The AOI for wildlife and wildlife habitat includes all lands located within the maximum footprint area of the combined practical alternatives and adjacent lands located within 120 m of the right-of-way. This area corresponds approximately with the ACA.

# 2.1.5 Designated Natural Areas

The AOI for designated natural areas includes the ACA and its vicinity.

# 2.2 Data Collection

The methods for data collection are specific to each biological discipline. Data was collected from secondary source information, personal communications and detailed, multi-season field investigations.

# 2.2.1 Vegetation and Vegetation Communities

The geographical extent, composition, structure and function of vegetation communities were identified through air photo interpretation and field investigations. Air photos were interpreted to determine the limits and characteristics of vegetation communities. In the office, a coding system was used to identify each polygon according to its general location. These polygons were confirmed, refined and classified through field investigations. Data collection sheets, including a checklist of vascular plants likely to occur in the AOI and vegetation community forms, were prepared in the office for completion in the field. Botanical inventories prepared previously for Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas (ESAs), Evaluated Wetlands and Candidate Natural Heritage Sites (CNHSs) were reviewed to familiarize the botanists with floral composition of the AOI and verified in the office.

Field investigations of natural/semi-natural vegetation were conducted by LGL Limited on: April 17-21, 2006; May 15-19, 2006; June 12-16, 2006; July 24-28, 2006; August 21-24, 2006; and, October 2-6, 2006. Field crews typically consisted of two to four botanists working in tandem. Vegetation communities were surveyed several times throughout the year to capture the optimal growing season for the flora present.

Vegetation communities were classified according to the *Ecological Land Classification (ELC) for Southern Ontario: First Approximation and Its Application* (Lee *et al.* 1998). The vegetation communities were sampled using a plotless method for the purpose of determining general composition and structure of the vegetation. Plant species status was reviewed for Canada (Committee on the Status of Endangered Wildlife in Canada

(COSEWIC) 2006), Ontario (Committee on the Status of Species at Risk in Ontario (COSSARO) 2006) and for Essex County (Oldham 1993). Vascular plant nomenclature follows Newmaster *et al.* (1998), with a few exceptions.

Every attempt was made to identify vascular plants in the field. Where a conclusive identification could not be made in the field, plant material was collected for examination in the laboratory. A GPS unit was used to record the location of species at risk whose identify could be confirmed in the field. Many species at risk and representative vegetation communities were also photographed for verification purposes.

### 2.2.2 Molluscs and Insects

The mollusc and insect investigation is based on secondary source information collected in 2006 through literature searches, review of databases and personal communications with local experts. Data was requested and obtained via email, fax, letter, personal communications, and from published and unpublished literature. The following organizations were contacted directly for data:

- Department of Fisheries and Oceans Canada Sarnia District Office and Burlington District Office (Great Lakes Laboratory for Fisheries and Aquatic Sciences);
- Environment Canada Karner Blue Recovery Team;
- Ontario Ministry of Natural Resources Natural Heritage Information Centre (NHIC), Peterborough and Chatham Area Office;
- Essex Region Conservation Authority;
- Ojibway Nature Centre;
- Toronto Entomology Association (Ontario Insects);
- Toronto Zoo;
- University of Guelph insect collection, and entomology and mollusc researchers; and
- University of Windsor fisheries and mollusc researchers.

Background data collected was reviewed and compiled into two databases (molluscs and insects), since all of the data received related to these two invertebrate groups. Nomenclature and taxonomy follows the University of Guelph Insect Collection Ojibway Prairie Species List, recent journal articles and the NHIC.

Federal and provincial rankings administered by COSEWIC and COSSARO were considered during the species review. Due to the lack of evaluations of invertebrate species by COSEWIC and COSSARO, "S-ranks" were also considered during the investigation as many more invertebrates have received an S-rank. S-ranks are a ranking system for a species status in Ontario and are also applied by the NHIC. Species with an S-rank of S1 to S3 are considered extremely rare, very rare or rare within the province and were used to limit the scope of the investigation.

### 2.2.3

### Fish and Fish Habitat

All watercourses/waterbodies located within the AOI were investigated to determine the presence/absence of fish habitat and the characteristics of the fish community present. Field investigations were conducted by LGL Limited on: May 3-5, 2006; September 18-21, 2006; and, October 5, 2006.

The fish community was surveyed by visual observation or by fish collections using a backpack electrofishing unit, dip net or minnow trap at a total of 58 stations. The location of sampling stations is presented in Figure 2 and described in Table 2. Prior to field investigations, a Permit to Collect Fish for Scientific Purposes was obtained from the MNR Area Office in Chatham and the Department of Fisheries and Oceans was contacted to determine if a Species at Risk Permit was required. All fish captured were identified in the field or preserved in alcohol for laboratory identification.

Fish habitat was characterized along each stream reach located within the AOI. Stream reaches were delineated using the boundary of the ACA, road or highway crossings or the confluence with another watercourse. The habitat survey was carried out following the MTO Environmental Manual - Fisheries (MTO 1994), the Draft Environmental Reference for Highway Design (MTO 2002) and in accordance with the MTO/MNR Fisheries Protocol (1993). Physical features were surveyed in sufficient detail to enable mapping and identification of key habitat types. The physical habitat attributes assessed included:

- Stream dimensions and flow conditions;
- Water quality, including conductivity, pH, temperature and water colour;
- Stream morphology;
- Groundwater discharge areas;
- Substrate characteristics;
- Stream bank stability;
- In-stream cover;
- Riparian vegetation;
- Stream canopy cover;
- Stream gradient;
- Macrophytic (aquatic) vegetation;
- Instream barriers to fish movement;
- Critical habitats; and
- Potential fish habitat compensation measures.



### LEGEND



Maximum Footprint Area of Combined Alternatives Benthic Sampling Station

Fish Sampling Station

Bird Point-Count Survey Station

Data Sources: LGL Limited field surveys, Spring 2006 aerial photography.

### **BENTHIC, FISH, AND BIRD POINT-COUNT** SURVEY STATIONS



Project	: TA4137	Figure:	2
Date:	February 2007	Prepared E	By: MWF
Scale:	1:35,000	Checked E	By: GNK

Station No.	GPS Coordinates	Drains	Habitat			
1	0328333 4684598	Large Bay	Fish habitat			
2	0328042 4683627	McKee Creek	Fish Habitat			
3	0327835 4683101	Ditch	Not Fish Habitat			
4	0327675 4682830	Healy Drain	Not Fish Habitat			
5	0327582 4682648	Healy Drain	Seasonal Fish Habitat			
6	0327120 4682805	Healy Drain	Seasonal Fish Habitat			
7	0327060 4682524	Broadway Drain	Seasonal Fish Habitat			
8	0327564 4682464	Healy Drain	Not Fish Habitat			
9	0327433 4682299	Broadway Drain	Not Fish Habitat			
10	0327491 4682145	Pond	Not Fish Habitat			
11	0328028 4682098	Broadway Drain	Not Fish Habitat			
12	0328099 4682253	Healy Drain	Not Fish Habitat			
13	0328421 4681784	Susan Drain	Not Fish Habitat			
14	0328591 4681910 🥒	NoName Drain	Not Fish Habitat			
15	0328976 4681555	Susan and NoName	Not Fish Habitat			
16	0328467 4682497	McKee Creek	Fish Habitat			
17	0328823 4682421	McKee Drain	Fish Habitat			
18	0329205 4682444	McKee Drain	Fish Habitat			
19	0329110 4682267	McKee Drain	Fish Habitat Downstream Only			
20	0329305 4682215	McKee Drain	Not Fish Habitat			
21	0329696 4681545	Titcombe Drain	Seasonal Fish Habitat			
22	0330185 4682207	Vernal pool	Not Fish Habitat			
23	0329759 4681811	Titcombe Drain	Seasonal Fish Habitat			
24	0330594 4681942	Basin Drain	Not Fish Habitat			
25	0330569 4681911	Basin Drain	Not Fish Habitat			
26	0330562 4681875	Basin Drain	Fish Habitat			
27	0331273 4681458	Youngstown Drain	Seasonal Fish Habitat			
28	0330924 4681537	Youngstown Drain	Seasonal Fish Habitat			
29	0330822 4681556	Youngstown Drain	Seasonal Fish Habitat			
30	0330700 4681553	Basin Drain	Fish Habitat			
31	0330714 4681496	Basin and Youngstown	Fish Habitat			
32	0330778 4681487	Youngstown Drain	Seasonal Fish Habitat			
33	0330352 4681030	Basin Drain	Fish Habitat			
34	0331391 4681255	Marentette Drain	Not Fish Habitat			
35	0331082 4680897	Marentette Drain	Not Fish Habitat			
36	0331256 4680379	Marentette and Turkey	Not Fish Habitat			
37	0330880 4680589	Wetland	Not Fish Habitat			
38	0331652 4680693	Turkey Creek	Fish Habitat			
39	0331543 4680078	Standing water	Not Fish Habitat			
40	0332332 4679259	Lennon Drain	Fish Habitat			
41	0332477 4678862	Cahill Drain	Fish Habitat			
42	0332915 4678928	Cahill and Talbot	Fish Habitat			
43	0333348 4678533	Talbot Drain	Not Fish Habitat			
44	0335132 4676696	Howard Ave, Noname, Dickson	Not Fish Habitat			
45	0335166 4676667	Burke, NoName	Not Fish Habitat			

### TABLE 2. FISH SAMPLING STATIONS

Station No.	GPS Coordinates	Drains	Habitat
46	0335467 4676542	Dickson, Benson	Fish Habitat
47	0335900 4677241	Burke Drain	Fish Habitat
48	0336718 4677364	Collins Drain	Seasonal Fish Habitat
49	0336309 4677566	Collins and Wolfe	Fish Habitat (Wolfe)
50	0336072 4677640	NoName	Not Fish Habitat
51	0335714 4677723	Wolfe Drain	Fish Habitat
52	0335269 4677923	NoName and Wolfe	Fish Habitat (Wolfe)
53	0334095 4678714	Cahill Drain	Fish Habitat
54	0333789 4678642	Cahill and Wolfe	Fish Habitat
55	0333191 4678972	Cahill and Wolfe	Fish Habitat
56	0332540 4679315	Lennon Drain	Fish Habitat
57	not recorded	pond	Fish Habitat
58	not recorded	McKee Creek	Fish Habitat

#### TABLE 2. FISH SAMPLING STATIONS

Data was recorded in the field using the standard MTO Field Collection Record forms and representative photographs were taken.

In addition, benthic samples were collected from six stations in the AOI (Stations 3 and 9) and its vicinity (Stations 1, 4, 5 and 6). Stations 2, 7 and 8 are located on watercourses located outside the AOI. The location of benthic sampling stations is presented in Figure 2. Samples were collected on March 9, 2005 (Stations 1 and 3), and March 10, 2005 (Station 4, 5, 6, and 9) using the traveling kick and sweep transect method. Three samples were taken at each station, two from riffles and one from a pool. Benthic organisms from each transect were identified separately and then replicate samples from each station were combined to achieve sufficient populations for analysis.

A habitat and substrate survey of the Detroit River at the locations of possible bridge piers in Canadian waters was conducted on October 5, 2006 using an underwater video camera and Ekman dredge. At each possible pier location, a SeaViewer underwater camera was deployed over the side of the boat and data recorded to a hand-held video recorder. GPS coordinates along transects were recorded simultaneously through a feature on the video camera system. The captain of the boat controlled the drift speed with an electric trolling motor. Several drifts were made at the southern bridge pier and one at the northern bridge pier. Data were recorded to the digital video tape in the hand held camcorder and transferred to DVD at a later time. Once all of the video runs were completed at the sites, the substrate was investigated using an Ekman dredge.

### 2.2.4

### Wildlife and Wildlife Habitat

The purpose of the field investigations was to document wildlife habitat and wildlife occupation and to characterize the nature, extent and significance of animal usage within the AOI. Existing information on wildlife species previously found within the AOI came from various sources. The Ontario Herpetofaunal Summary Database of the Natural Heritage Information Center (NHIC) provided amphibian and reptile lists, locations and status. The Ontario Breeding Bird Atlas (OBBA) program provided up-to-date lists of birds breeding within specific areas of Ontario while information from The Conservation

Priorities for the Birds of Southern Ontario provided lists of migratory bird species in Essex County designated as species for habitat protection by local municipalities. It also ranks bird species highly sensitive to disturbances of their breeding habitats. The Atlas of the Mammals of Ontario provided locations of species found in Essex County. More specific information about wildlife previously documented around the AOI came from communications with personnel from the Ontario Ministry of Natural Resources and the Ojibway Prairie Nature Center in Windsor.

Wildlife habitat was delineated on air photos and refined through ground-truthing. The Ecological Land Classification (ELC) system was used to describe wildlife habitat, where appropriate. In many cases, similar wildlife habitat polygons were combined into a single polygon to reduce duplication, while in others cases new wildlife habitat polygons were delineated in areas not classified according to ELC. For this reason, the wildlife habitat polygons do not correspond exactly with the vegetation community polygons. Several areas, including factories, retail outlets and residential areas with high density could not be accessed or do not support wildlife habitat; hence, these areas were not investigated. The methods described in the Significant Wildlife Habitat Technical Guide (MNR 2000) were used to establish the significance of wildlife habitat.

Methods used to collect in-field information were tailored to each vertebrate class (ie. amphibians, reptiles, birds and mammals). Once the specific wildlife units within the AOI were mapped and the methods of investigation were established, diurnal and nocturnal investigations took place. Data was collected by a field crew of one or two biologists working in tandem using aerial photo maps, a GPS unit, binoculars, cameras, a headlamp, field notebooks and a laptop computer. Field investigations were conducted on: April 12-14 and 18-21, 2006; May 1-4, 2006; June 4-7, 11-16, 18-24 and 29-30, 2006; July 1, 2006; September 17-21, 2006; November 22-23, 2006; and, February 21-23, 2007.

Herpetofauna (reptiles and amphibians) were inventoried using the Visual Encounter Survey (VES) method (Heyer et al. 1994). Data was collected by simply searching for animals in a likely habitat at a likely time. Reptile investigations started in late spring and early summer after species came out of their hibernacula. Following the VES methodology, early morning searches for snakes in suitable habitats included flipping over rocks, logs, boards, shingles or any material snakes would hide under through the night. From mid to late morning, rocks, logs and ashphalt pathways, used for basking areas, were also investigated. By the afternoon, searches turned to habitats considered as snake hunting and feeding areas, like cultural meadows and areas in and around wetlands. Also, sheets of wood, laid out in different habitats to attract snakes for use as cover and warmth, were checked in the morning and late afternoons for activity. Turtles were found by investigating their potential habitats, like creek drains or ponds, and observing them basking on logs in ponds during late mornings, swimming on the bottom of ponds in search of food or crossing over roads and pathways when moving from pond to pond during the day.

For amphibians, in the spring and early summer season when frog and toad activity was at its peak, nightly road cruises by vehicle and breeding call surveys were employed. By identifying frog and toad breeding calls during evening road cruises, locations of important breeding areas were found. Daytime searches of wetlands, identified as potential amphibian breeding areas, were also made. After the breeding season, wetlands were searched for amphibian egg masses and/or tadpoles to identify any frog or toad species found in these locations.

Prior to conducting bird surveys, aerial photos of the AOI and its surroundings were checked to see if there were areas of continuous forests, cultural thickets, etc. that could potentially be used as spring and fall migration corridors. These maps were also used to determine where preferred nesting habitats could exist during the breeding season. Any potential areas were then ground-truthed by simply observing and recording species in chosen habitats at the right time of year. During the spring and fall seasons, specific habitats throughout the AOI were monitored for areas of large bird movements and stopover points.

Two inventory methods were used to determine the breeding bird composition and locations of breeding activity in the AOI: the point-count method (Ralph et al. 1995; Bibby et al. 1997); and, nest surveys. Due to the large size of the AOI and the need to represent as many of the habitats as possible, non-random locations were selected for point-counts. These specific locations, selected in areas that maximized the amount of habitats covered per count, increased the number of species recorded in as short of time as possible. Each point-count station was recorded using a hand-held GPS unit. A total of 60 point-count stations were censused twice, a minimum of seven days apart, for a total of 120 point-count surveys. The locations of the point-count survey stations are shown in Figure 2. Point-counts were started 30 minutes before dawn and stopped by 0900 to 0930 hours. Five minutes of suitable bird observation and bird call listening times were standard per station (time increased to 10 minutes in areas of high environmental noise such as traffic or industrial activities). Station locations were at least 125 m or more apart to prevent bird identification overlap. The criteria of the BBA breeding bird survey was used for identifying breeding bird behaviour (eg. carrying food to young, territorial song, etc.) as evidence of birds breeding within a location. Evening spot checks were also made in habitats considered to have owl species. Tape recordings of owl calls were played to induce a response for species identification.

The second method used to identify species composition consisted of a nest survey performed in the summer and fall seasons. This was undertaken as a secondary method of data collection to determine breeding bird occurrence in particular habitats. In the summer season, most nests were located by focusing on the breeding behaviour of particular bird species. Early morning observations of female returning to their nests after morning forages were used to identify their nest location. Observations of other behavioural signals (eg. carrying nest-building materials, copulations, territorial disputes, etc.) were used to lead an observer to areas of high nest probability or directly to the nest itself. In the fall season, when breeding season was over and tree foliage disappeared, clumps of structured grasses in trees or fecal deposits under tree nest holes were used to identify nests. Nest locations were recorded and habitat types noted.

Mammals were inventoried using a variety of methods, such as the identification of tracks, trails, sounds, scats, smells and individual species behavioral signs, such as plant cuttings, nest sites, lodges, etc. (Wilson et al. 1996). As many habitats as possible were searched using the VES method. The investigatior simply walked through an area searching for mammals using the variety of methods mentioned above. Evening road cruises by vehicle were made to spot mammals crossing roadways. Early morning walks just before sunrise and late afternoon walks just before dark were also made to catch mammal movements to and from their daytime haunts. These investigations were repeated in the same wildlife areas more than once to increase the accuracy of the species composition recorded. Species locations and the habitats they were sighted in were recorded. Daily mammal movement corridors which showed important connections between habitats were also recorded. Bats however, being volant mammals of the night, were difficult to identify in the field without the proper equipment. Since high frequency

bat detectors were unavailable, secondary source information was relied upon to determine the bat species present in the AOI.

Any species at risk found in the field had its location recorded with a GPS unit and a photograph taken for verification, where possible. Data collected in the field from each of the vertebrate class investigations was transferred into a laptop computer on a daily basis. Field notes, GPS coordinates and photographs were downloaded into wildlife tables for future analysis. This data was analysized and used to determine the locations of sensitive habitats in the AOI.

# 2.2.5 Designated Natural Areas

Information on designated natural heritage areas was derived from the secondary sources consulted during the preparation of the Environmental Overview Report (Border Transportation Partnership 2005). The information contained in the Environmental Overview Report was reviewed, updated and augmented to reflect the revised AOI.

2.3 Data Analysis

# 2.3.1 Vegetation and Vegetation Communities

2.3.1.1 Vegetation Species

A total of 618 vascular plant taxa were recorded in the AOI. One-hundred and eighty-six taxa or 30 percent of the recorded flora are considered introduced and non-native to Ontario. Sixty-three species are considered Extremely Rare, Very Rare or Rare within the province (S1-S3) and eight are regulated under the federal *Species at Risk Act* (SARA) and the new Ontario *Endangered Species Act* (OESA). The acronyms and definitions used to assign global, federal and provincial importance to species are presented in Appendix A. A list of vascular plants identified in the AOI is presented in Appendix B.

2.3.1.2

### Vegetation Communities

Vegetation communities located in the AOI consist primarily of recently disturbed communities, including Cultural Woodlands (CUW1), Cultural Meadows (CUM1-1), Cultural Thickets (CUT1) and Cultural Savannahs (CUS1). In the past, these areas would have been dominated by a mixture of tallgrass prairie and natural savannah. As a result of anthropogenic influences, there has been a reduction in the frequency of fire, and an increase in agricultural activities and urban development. Non-prairie herbaceous plant species have invaded and now dominate the meadows and ground cover. Woody species have increased due to the lack of fire and now dominate in the form of CUW1, CUT1 and CUS1 communities. Despite the influence that humans have had on the composition and structure of the vegetation communities located within the AOI, remnant patches of Tallgrass Prairie (TPO2-1) exist on the periphery of the Ojibway Prairie Complex. The location of vegetation communities is presented in Figure 3. A detailed description of community types and their corresponding polygon codes is presented in Appendix C. The general structure and composition of the predominant vegetation community types are described.









#### Wooded Cultural Communities

CUW1 communities are dominated by a mixture of adventive woody species such as eastern cottonwood (*Populus deltoides* ssp. *deltoides*), Freeman's maple (*Acer X freemanil*) and Manitoba maple (*Acer negundo*) and they have less than 60 percent tree cover. CUS1 communities have a lower percent tree cover at less than 35 percent and are made up of Manitoba maple, black walnut (*Juglans nigra*) and eastern cottonwood. CUT1 communities are clusters of shrubs, including gray dogwood (*Cornus foemina* ssp. *racemosa*), staghorn sumac (*Rhus typhina*) and common buckthorn (*Rhamnus cathartica*). All three community types have a high percentage of species that are considered introduced and non-native to Ontario. Three Cultural Plantations (CUPs) are present in the AOI including planted red oak (*Quercus rubra*), eastern white cedar (*Thuja occidentalis*) and Scots pine (*Pinus sylvestris*).

#### **Cultural Meadow**

CUM1-1 communities consist of species that are typical of disturbed sites. Based on the species composition of these sites, it is likely that they are regularly mown (manicured) or ploughed. Grasses and invasive forbs, such as wild carrot (*Daucus carota*), common reed (*Phragmites australis*), tall goldenrod (*Solidago altissima* var. *altissima*), orchard grass (*Dactylis glomerata*), Canada goldenrod (*Solidago canadensis*) and Kentucky bluegrass (*Poa pratensis* ssp. *pratensis*) are dominant. Colonization of these areas by woody species is limited. Some of the cultural meadow communities were cultivated in the past.

#### **Deciduous Forests**

There was a wide range of successional stages in the deciduous forest communities in the AOI. Communities ranged from young through mid-aged to mature. Many of the forests contained a high percentage of native species, while others were dominated by non-native species. Deciduous forests occurred in both upland and lowland areas. Forests with dry to fresh soil conditions were dominated by black oak, white oak, shagbark hickory (*Carya ovata*), Manitoba maple and black locust (*Robinia pseudo-acacia*). Forests with fresh to moist soil conditions were dominated by American elm (*Ulmus americana*), red ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), black walnut, eastern cottonwood, sassafras (*Sassafras albidum*), pin oak, swamp white oak (*Quercus bicolor*) and Freeman's maple. Natural succession and anthropogenic disturbances have resulted in high forest diversity with a total of 12 ELC forest community types.

#### **Tallgrass Prairie**

A proportion of the meadow communities contain a greater abundance of early successional tallgrass prairie species. These meadows have the potential to be classified as either meadow or forb prairie, but there is no classification within the ELC manual for early successional forb prairie communities. Thus, a criterion was used by LGL to classify forb prairies as either CUM1-1 or TPO2-1 communities. This criterion was the amount of anthropogenic disturbance and the ratio of introduced to tallgrass species. The forb prairies in the area of investigation contain wild bergamot (*Monarda fistulosa*), ironweed (*Vernonia gigantea*), Canadian tick-trefoil (*Desmodium canadense*), gray-headed coneflower (*Ratibida pinnata*), rough-headed bush-clover (*Lespedeza capitata*), tall

tickseed (*Coreopsis tripteris*), tall wild sunflower (*Helianthus giganteus*) and spiked blazing star (*Liatris spicata*). Conversely, the forb prairies contained a lesser proportion of tallgrass than in the tallgrass prairie communities. TPO2-1 communities have experienced the least amount of anthropogenic disturbance of the open communities found in the AOI. They contain a mixture of native tall grasses and prairie forbs, including Indian grass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Virginia culver's root (*Veronicastrum virginicum*), colic-root (*Aletris farinosa*), ironweed and tall cord grass (*Spartina pectinata*). Past fire occurrence is evident in many of the healthy TPO2-1 communities.

Groundwater is known to play an important role in sustaining the tallgrass prairie communities. Hydrogeological conditions in the AOI consist generally of shallow surficial sand, silt and fill over unsaturated clayey silt over saturated silty clay over bedrock. The tallgrass prairie communities are sustained by the surficial sand, silt and fill layer (surface aquifer) that is saturated by rainfall. Percolation downwards from the surface aquifer through the unsaturated clayey silt (aquatard) to the deep aquifer (saturated clayey silt and bedrock) is very slow. The groundwater table in the surficial aquifer is located approximately 2 to 3 m below ground surface, depending on site-specific conditions and the amount of rainfall.

#### Oak Savannah and Woodland

One oak savannah community was found in the AOI and it was dominated by pin oak (*Quercus palustris*) and bur oak (*Quercus macrocarpa*). Two types of oak woodlands were encountered and they consist of black oak, white oak and pin oak. These communities contain many native drought resistant grasses and sedges, plus numerous tallgrass prairie forb species.

#### Wetlands

The wetlands in the AOI include swamps, marshes and open aquatic communities. The deciduous swamps are dominated by pin oak, Freeman's maple and eastern cottonwood. The meadow marshes are composed of common reed, European beggar-ticks (*Bidens tripartita*) and devil's beggar-ticks (*Bidens frondosa*), while the shallow marshes are made up of narrow-leaved cattail (*Typha angustifolia*). There was one small Open Aquatic (OAO) community that had an algal bloom in the mid-summer, which cleared up by the late summer.

2.3.1.3

### Species at Risk

Eight species listed as Special Concern, Threatened or Endangered by COSEWIC or COSSARO and regulated under the SARA and the new OESA were recorded during field investigations (colic-root, willow aster, Kentucky coffee-tree, spiked blazing star, Shumard oak, prairie rose, Riddell's goldenrod and butternut). Two species, summer snowflake, considered Globally Very Rare (G2) and butternut, considered Globally Rare to Uncommon (G3), were also recorded duing field investigations. Sixty-three species considered Extremely Rare (S1), Very Rare (S2) and Rare to Uncommon (S3) according to the NHIC were observed during field investigations. A list of provincially rare plant species located in the AOI is presented in Table 3.

#	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Legal
1	Agalinis purpurea	large purple agalinis			G5	S1	
2	Aristida purpurascens var. purpurascens	arrow-feather three-awn			G5T?	S1	
3	Eupatorium altissimum	tall joe-pyeweed			G5	S1	
4	Euthamia gymnospermoides	viscid bushy goldenrod			G5	S1	
5	Juncus biflorus	two-flowered rush			G5Q	S1	
6	Juncus brachycarpus	short-fruited rush			G4G5	S1	
7	Ludwigia alternifolia	rattle-box			G5	S1	
8	Pycnanthemum verticillatum var. pilosum	hairy mountain-mint			G5T5	S1	
9	Rudbeckia fulgida	orange coneflower			G5	S1	
10	Scleria triglomerata	tall nut-rush			G5	S1	
11	Silphium terebinthinaceum var. terebinthinaceum	prairie dock			G4G5T4T5	S1	
12	Sisyrinchium albidum	white blue-eyed-grass			G5?	S1	
13	Vitis labrusca	fox grape			G5	S1	
14	Agalinis tenuifolia var. macrophylla	slender-leaved agalinis			G4G5Q	S1?	
15	Aletris farinose	colic-root	THR	THR	G5	S2	SARA(1) OESA(4)
16	Asclepias purpurascens	purple milkweed			G4G5	S2	
17	Asclepias sullivantii	Sullivant's milkweed			G5	S2	
18	Aster praealtus var. praealtus	willow aster	THR	THR	G5T?	S2	SARA(1)
19	Baptisia tinctoria	wild indigo			G5	S2	
20	Campsis radicans	trumpet creeper			G5	S2	
21	Carex squarrosa	squarrose sedge			G4G5	S2	
22	Coreopsis tripteris	tall tickseed			G5	S2	
23	Fraxinus profunda	pumpkin ash			G4	S2	
24	Gaura biennis	biennial gaura			G5	S2	
25	Gleditsia triacanthos	honey locust			G5	S2	
26	Gymnocladus dioicus	Kentucky coffee-tree	THR	THR	G5	S2	SARA(1) OESA(4)
27	Juncus marginatus	grass-leaved rush			G5	S2	
28	Krigia biflora var. biflora	two-flowered Cynthia			G5	S2	
29	Liatris aspera var. intermedia	rough blazing star			G4G5T?	S2	
30	Liatris spicata	spiked blazing star	THR	THR	G5	S2	SARA(1) OESA(4)
31	Ludwigia polycarpa	many-fruited false loosestrife			G4	S2	
32	Oxypolis rigidior	cowbane			G5	S2	
33	Paspalum setaceum	bristle-like paspalum			G5	S2	
34	Suaeda calceoliformis	western seablite			G5	S2	
35	Thalictrum revolutum	waxy meadow-rue			G5	S2	
36	Tradescantia ohiensis	Ohio spiderwort			G5	S2	
37	Veronicastrum virginicum	Virginia culver's-root			G4	S2	

TABLE 3. PROVINCIALLY RARE VEGETATION SPECIES LOCATED IN THE AOI

#	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Legal
38	Ratibida pinnata	gray-headed coneflower			G5	S2S3	
39	Agrimonia parviflora	many-flowered agrimony			G5	S3	
40	Aureolaria flava	yellow false foxglove			G5	S3	
41	Aureolaria pedicularia	fern-leaved false foxglove			G5	S3	
42	Carex swanii	swan's sedge			G5	S3	
43	Carex trichocarpa	hairy-fruited sedge			G4	S3	
44	Carya glabra	pignut hickory			G5	S3	
45	Carya laciniosa	big shellbark hickory			G5	S3	
46	Eupatorium purpureum var. purpureum	purple joe-pye-weed			G5T?	S3	
47	Galium pilosum var. pilosum	hairy bedstraw			G5T?	S3	
48	Geum vernum	spring avens			G5	S3	
49	Hypoxis hirsute	yellow star-grass			G5	S3	
50	Juncus greenei	Greene's rush			G5	S3	
51	<i>Lithospermum caroliniense</i> var. <i>croceum</i>	plains puccoon			G4G5T4T5	S3	
52	Lythrum alatum	wing-angled loosestrife			G5	S3	
53	Nyssa sylvatica	black gum			G5	S3	
54	Panicum sphaerocarpon	rough-fruited panic grass			G5	S3	
55	Quercus palustris	pin oak			G5	S3	
56	Quercus shumardii	shumard oak	SC	SC	G5	S3	SARA(3) OESA(5)
57	Rosa setigera	prairie rose	SC	SC	G5	S3	SARA(1) OESA(5)
58	Solidago riddellii	Riddell's goldenrod	SC	SC	G5	S3	SARA(1) OESA(5)
59	<i>Solidago rigida</i> ssp <i>. Rigida</i>	stiff-leaved goldenrod			G5T5	S3	
60	Vernonia gigantea	ironweed			G5T	S3	
61	Juglans cinerea	butternut	END	END	G3G4	S3?	SARA(1) OESA(3)
62	Vernonia missurica	ironweed			G4G5	S3?	
63	Ornithogalum umbellatum	summer snowflake			G2?	SE3	

### TABLE 3. PROVINCIALLY RARE VEGETATION SPECIES LOCATED IN THE AOI

Note: Species status is current to October 2007.

Many of the vegetation communities identified in the AOI are considered Provincially Extremely Rare (S1), Provincially Very Rare (S2) or Provincially Rare to Uncommon (S3), while others and/or the same communities are considered Globally Extremely Rare (G1) or Globally Very Rare (G2) (NHIC 1997). Notable communities include:

- 24 Fresh-Moist Tallgrass Prairies (TPO2-1) (G2 and S1);
- four Pin Oak Mineral Deciduous Swamps (SWD1-3) (G2 and S2S3);
- three Dry-Fresh Black Oak Deciduous Forests (FOD1-3) (S3);
- two Dry-Fresh Mixed Oak Deciduous Forests (FOD1-4) (S3S4);
- two Fresh-Moist Black Walnut Lowland Deciduous Forests (FOD7-4) (S2S3);
- two Fresh-Moist Black Oak-White Oak Tallgrass Woodlands (TPW2-1) (G2 and S1);
- one Dry-Fresh Oak-Hickory Deciduous Forest (FOD2-2) (S3S4);
- one Fresh-Moist Pin Oak-Bur Oak Tallgrass Savannah (TPS2-1) (G1 and S1); and
- one Fresh-Moist Pin Oak Tallgrass Woodland (TPW2-2) (G1 and S1).

A list of provincially significant vegetation communities located in the AOI ordered by Srank is presented in Table 4. Based on a review of secondary source information, we believe that most of these rare vegetation communities and species are represented in the designated Ojibway Prairie Complex ANSI, although further field investigations in areas located outside of the AOI would be required to substantiate this opinion.

ELC Code	ELC Description	G rank	S rank
TP02-1	Fresh-Moist Tallgrass Prairie	G2	S1
TPS2-1	Fresh-Moist Pin Oak-Bur Oak Tallgrass Savannah	G1	S1
TPW2-1	Fresh-Moist Black Oak-White Oak Tallgrass Woodland	G2	S1
TPW2-2	Fresh-Moist Pin Oak Tallgrass Woodland	G1	S1
FOD7-4	Fresh-Moist Black Walnut Lowland Deciduous Forest	G4?	S2S3
SWD1-3	Pin Oak Mineral Deciduous Swamp	G2	S2S3
FOD1-3	Dry-Fresh Black Oak Deciduous Forest	G4?	S3
FOD1-4	Dry-Fresh Mixed Oak Deciduous Forest	G?	S3S4
FOD2-2	Dry-Fresh Oak-Hickory Deciduous Forest	G4?	S3S4

TABLE 4. PROVINCIALLY RARE VEGETATION COMMUNITIES LOCATED IN THE AOI

There were numerous vegetation communities that contain a high diversity of provincially rare (S1 to S3) species. Vegetation communities LAM1, ANS2C, ANS2, NAR15, NAR16, NCH12, ANS1, NHC4B, LAM2, YWK1, YWK1C, ANS2B, ANS2D, ESA5, HCL3, MAL3B, NAR1, NAR4A, NAR4C, NCH4Z and YWK1B contain ten to 18 S1 to S3 species. Vegetation communities ESA2, NSG5, OAK1B, RED12, RED13, BBA4F-L,N,P,R, HCL6, MAL1D, ESA4, MAL3, NAR4B, NCH12B, NCH2B, OAK1A, RED2, RED8, ANS1A, LAM3, LAM4D, MAL1, NCH2E, BBA1, BBA4EC, BBA4MB, ESA2, MAL10, MAL11, MAL1B, MAL9, NCH1A, NCH1B, NCH1C, NCH1D,NGM1, NGM2, OAK2, OAK3, OAK4, RED4 and RED7 contain five to nine S1 to S3 species. Ninety-eight other ELC communities contain one to four S1 to S3 species. A complete list of vegetation communities and the species of rare plants identified in these communities is presented in Appendix D.
# 2.3.2 Molluscs and Insects

# 2.3.2.1 Molluscs

Molluscs are among the most conspicuous and familiar invertebrate animals and include such forms as clams, squids, octopods and snails. Data were reviewed and obtained on two classes of Mollusc phyla, the Bivalves (clams) and the Gastropods (snails).

Freshwater mussels (Unionids) are a type of Bivalve and are benthic sedentary animals with a life expectancy of 10 to 80 years depending on the species. Unionids spend the bulk of their life residing in the sediment of watercourses. However, as part of the larvae (glochidia) development, the offspring must attach to the gills of a host fish (or salamander for one species) and parasitize the host until they are sufficiently mature to drop off as juveniles. Many species of Unionids require specific host fish species for development. Unionids are among the most endangered organisms in North America (Metcalfe-Smith *et. al.* 2005), and considerable research has been done in Ontario to investigate our native species. In Ontario 28 of 41 native species are showing signs of decline (Metcalfe-Smith *et. al.* 2005), and 10 species are ranked federally and/or provincially as Endangered or Threatened (Table 5).

Much less is known of the terrestrial and aquatic Gastropods of Ontario. Gastropods are divided into three groups, the Prosobranchs, Opisthobrachs and the Pulmonates. The Prosobranchs and Opisthobrachs posses gills and are purely aquatic, but only the Prosobranchs are a freshwater species. Pulmonates have lungs that enable them to respire oxygen from freshwater and/or the air. There are approximately 485 species of Gastropods in North America, none of which are ranked federally or provincially in Ontario.

### Screening for Mollusc Species of Significance

Mollusc investigations in the Windsor area have been largely limited to the Detroit River, and very little data is available on the terrestrial Gastropods or the Unionids and Gastropods inhabiting the inland watercourses. Historically, numerous native species of Unionids were known to inhabit the Detroit River, however recent studies indicate that no native Unionids remain in the Detroit River due to pollution, habitat loss and competition with zebra mussels (*Dreissena polymorha*) (T. Morris, J. Ciborowski, L. Corkum and G. Mackie pers. comm.). Screenings for the presence of native Unionids within the watercourses in the AOI and its vicinity were unable to confirm the presence of any federally or provincially ranked species. No known recent mollusc investigations have been conducted in the AOI and its vicinity (aside from the Detroit River). However, Snuffbox (*Epioblasma triquetra*) is known to occur within the County of Essex according to the NHIC.

Class	Family	Scientific Name	Common Name	Present	COSEWIC	COSSARO	SRank	Legal
Gastropoda	Pomatiopsidae	Pomatiopsis lapidaria	Slender Walker	? <sup>E</sup>			S3	FA
	Discidae	Discus patulus	Domed Disc	? <sup>E</sup>			S2S3	FA
	Philomycidae	Philomycus carolinianus	Carolina Mantleslug	?E			S1S2	FA
	Polygyridae	Mesodon pennsylvanicus	A Snail	Y	+		S1	FA
		Mesodon zaletus	Toothed Globe	Y	*		S1S2	FA
		Stenotrema barbatum	Bristled Slitmouth	?E			S2	FA
		Stenotrema hirsutum	Hairy Slitmouth	?E			∕S1	FA
		Xolotrema denotatum	A Snail	?E			S2S3	FA
	Succineidae	Succinea ovalis	A Snail	?E		a start and a start a s	S3S4	FA
	Zonitidae	Glyphyalinia luticola	A Snail	? <sup>E</sup>			S1S2	FA
Bivalvia	Unionidae	Epioblasma torulosa rangiana	Northern Riffleshell	?	END	END	S1	SARA(1), OESA(3), FA
		Epioblasma triquetra	Snuffbox	?E	END	END	S1	SARA(1), OESA(3), FA
		Lampsilis fasciola	Wavy-rayed	?	END	END	S1	SARA(1), OESA(3), FA
		-	Lampmussel					
		Obovaria subrotunda	Round Hickorynut	?	END	END	S1	SARA(1), OSEA(3), FA
		Pleurobema sintoxia	Round Pigtoe	?	END	END	S1	SARA(1), OESA(3), FA
		Ptychobranchus fasciolaris	Kidneyshell	?	END	END	S1	SARA(1), OESA(3), FA
		Quadrula quadrula	Mapleleaf	?	THR	THR	S2	SARA(Pending*),OESA(4), FA
		Simpsonaias ambigua	Mudpuppy Mussel	?	END	END	S1	SARA(1), OESA(3), FA
		Villosa fabalis	Rayed Bean	?	END	END	S1	SARA(1), OESA(3), FA
		Villosa iris	Rainbow	?	END	THR	S2S3	SARA(Pending*), OESA(4), FA

\*Status not yet assigned, though anticipated shortly. COSEWIC and COSSARO are expected to list these species concurrently.

Note: Species status is current to October 2007.

#### Present:

Y - confirmed present in the vicinity of the AOI

? - possibly present in the vicinity of the AOI

Possibly present in the vicinity of the AOI and known to occur in Essex County according to NHIC
 P<sup>T</sup> – possibly present in the vicinity of the AOI and known to occur in the Town of Tecumseh
 P<sup>OD</sup> – possibly present in the vicinity of the AOI and documented in extreme southern Ontario by the Odonate Database, NHIC

Currently nine species are listed as Endangered and one species is listed as Threatened by COSEWIC, and eight species are listed as Endangered by COSSARO with two species pending a Threatened listing (Table 5). All Unionids are regulated under the *Fisheries Act* and eight of the ten listed species are regulated under the SARA and the new OESA, with two species pending regulation under SARA. There is the potential that these species may occur in the AOI and its vicinity as no comprehensive field investigations have been conducted of the Windsor area, and several of these species likely occurred in the Detroit River historically.

Data obtained from the MNR also indicates that two significant species of Gastropod occur in the AOI and its vicinity (Table 5). These two species (*Mesodon pennsylvanicus* and *Mesodon zaletus*) are ranked S1 and S1S2 respectively, meaning that they are Extremely Rare to Very Rare in Ontario. An additional eight provincially rare species are known to occur in the County of Essex and may occur in the AOI and its vicinity. There is the potential that these species and other rare Gastropods may occur in the AOI and its vicinity as no comprehensive field investigations has been conducted of the Windsor area. All aquatic Gastropods are regulated under the *Fisheries Act*.

Further investigation is required to determine the presence/absence of significant mollusc species in the AOI. Field investigations and habitat assessments are strongly recommended to screen for Unionids. Watercourses should be searched for living animals and discarded shells. Habitat assessments including inventories of water quality, connectivity, substrate, presence of host fish and other parameters is highly advised. Field investigations and habitat assessments using these sorts of techniques should also be applied for the screening of significant Gastropods.

## 2.3.2.2

## Insects

There are an estimated 30,000 known species of insects in Canada and over 2055 species of insects have been reported in the Ojibway Prairie Complex alone. Insects are the most abundant fauna in the world, and there are over 26 Orders of insects, including mayflies, damselflies and dragonflies, grasshoppers, cockroaches, termites, earwigs, stoneflies, lice, true bugs, thrips, beetles, fleas, true flies, caddisflies, moths and butterflies, and wasps and ants. Insects are present in all habitats and have a wide variety of forms and life cycles. Insects are generally under-investigated and under-protected; however, some research has been conducted in the Ojibway Prairie Complex area by researchers from the University of Guelph and other institutions. Considerable data has been gathered on the insects of the Ojibway Prairie but a lot of research still remains to be done. This area is known for its high species diversity and many rare species due to its geographic location and significant habitats.

### Screening for Species of Significance

The Ojibway Prairie Complex area has recently been relatively intensively investigated by entomologists, and there are several recent publications documenting researchers' findings. Given the sheer number of species present, most of the research efforts and publications have focused on select groups of insects. Records on insect species captured are maintained by the Ojibway Nature Centre and a database of insects of the Ojibway Prairie is maintained by the University of Guelph. In addition, there are several regular entomological activities organized at the Ojibway Prairie including an annual

butterfly count organized by the North American Butterfly Association and a dragonfly count organized by the Toronto Entomology Association, in conjunction with the Ojibway Nature Center.

Table 6 presents the insects listed by COSEWIC and COSSARO and regulated under the SARA, the new OESA and the FWCA that were reviewed to determine if they were potentially present in the AOI and its vicinity. Of these species, the Monarch is known to occur in the AOI and its vicinity; however, it is highly unlikely that the remainder of the above mentioned species occur in proximity to the AOI and its vicinity given their current distributions and habitat requirements.

Scientific Name	Common Name	COSEWIC	COSSARO	Legal
Callophrys irus	Frosted Elfin	Extirpated	Endangered	SARA(1),
				OESA(1),
				FWCA(P)
Lycaeides melissa	Karner Blue	Extirpated	Endangered	SARA(1),
samuelis				OESA(1),
				FWCA(P)
Erynnis persius	Eastern Persius	Endangered		SARA(1),
persius	Duskywing		W	OESA(2)
Papaipema aweme	Aweme Borer	Endangered		SARA(1),
	Moth			OESA(3)
Danaus plexippus 🗏	Monarch	Special	Special	SARA(1),
		Concern	Concern	OESA(5),
				FWCA(P)
Pieris virginiensis	West Virginia		Special	OESA(5),
-	White		Concern	FWCA(P)

	-			-	
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Note: Species status is current to October 2007.

Much of the data recently published on the insects in the vicinity of the AOI is documentation of new species for Canada, Ontario or the region. Compilation of this data and other records indicates that there are at least 113 species of conservation concern known from this area. This includes one species of Diptera (true flies), 22 species of Auchenorrhyncha Hemiptera (hoppers), 13 species of Heteroptera Hemiptera (true bugs), 41 species of Hymenoptera (bees and wasps), 17 species of Lepidopera (moths and butterflies), 13 species of Odonata (damselflies and dragonflies), and six species of Orthoptera (grasshoppers, crickets and katydids) (Table 7). Seven other species of Odonata may also be present based on data from the NHIC Odonata Database indicating that they occur in the County of Essex, Town of Tecumseh and/or extreme southern Ontario.

Of the 120 species present (or potentially present), 69 species have been assigned an Srank of S1 to S3 indicating that they are Extremely Rare, Very Rare or Rare to Uncommon within the province and five species have a rank of S4 or S5. A further 46 species are ranked SNR as there is insufficient data to rank the species. Since many of these species are new records for Ontario or Canada and are under-documented, there is a strong likelihood that many of these species ranked SNR are also provincially rare.

The Monarch is listed as Special Concern by COSEWIC and COSSARO and regulated under the SARA and the new OESA. The Monarch and five other species of butterflies are also regulated under the FWCA, due to their interest to collectors. Monarchs are known to inhabit and migrate through the Windsor area; however, there are no known Monarch staging (stop over) areas in the vicinity of the AOI.

Order	Family	Scientific Name	Common Name	Present	COSEWIC	COSSARO	Srank	Legal
Diptera	Psilidae	Loxocera ojibwayensis	A Fly	Y			SNR*	
Hemiptera	Cicadellidae	Balclutha abdominalis	A Leafhopper	Y			S1	
(Auchenorrhyncha)		Chlorotettix fallax	A Leafhopper	Y			S1	
		Chlorotettix spatulatus	A Leafhopper	Y			S2	
		Cuerna fenestella	A Leafhopper	Y			S1	
		Dorydiella kansana	A Leafhopper	Υ			S1	
		Flexamia inflate	A Leafhopper	Υ			S1	
		Flexamia prairiana	A Leafhopper	Υ			S1	
		Graminella oquaka	A Leafhopper	Y			S1	
		Graminella pallidula	A Leafhopper	Υ			S1	
		Hecalus flavidus	A Leafhopper	Υ			S1	
		Laevicephalus unicoloratus	A Leafhopper	Υ			S2	
		Limotettix elegans	A Leafhopper	Υ			S1	
		Mesamia nigridorsum	A Leafhopper	Υ			S1	
		Neokolla lugubris	A Leafhopper	Υ			S1?	
		Xerophloea major	A Leafhopper	Υ			S1	
		Xerophloea peltata	A Leafhopper	Υ			S1	
	Delphacidae	Delphacodes waldeni	A Plant Hopper	Υ			S1?	
		Megamelus metzaria	A Plant Hopper	Υ			SNR	
	Derbidae	Anotia westwoodi	A Plant Hopper	Υ			SNR	
	Flatidae	Anormenis septentrionalis	A Plant Hopper	Y			SNR	
		Ormenoides venusta	A Plant Hopper	Y			SNR	
	Membracidae	Publilia reticulate	A Tree Hopper	Y			S1?	

Order	Family	Scientific Name	Common Name	Present	COSEWIC	COSSARO	Srank	Legal
Hemiptera	Aradidae	Neuroctenus simplex	A Flat Bug	Y			S1S3	
(Heteroptera)	Coreidae	Chariesterus antennator	A Leaf-footed Bug	Y			S1S2	
		Euthochtha galeator (Fabricius)	A Leaf-footed Bug	Y			S1S3	
	Cydnidae	Pangaeus bilineatus	A Burrowing Bug	Y			S2S4	
	Geocoridae	Isthmocoris piceus (Say)	A Big-eyed Bug	Y			S2S4	
	Lygaeidae	Lygaeus turcicus (Fabricius)	Small Milkweed Bug	Υ			S1S3	
	Nabidae	Hoplistoscelis sordidus	A Damsel Bug	Υ	The second s		S4	
	Pentatomidae	Amaurochroa ovalis	A Stink Bug	Υ			S1?	
		Dendrocoris humeralis	A Stink Bug	Y 🧖			S2S4	
		Stiretrus anchorago fimbriatus (Say)	A Stink Bug	Y			S1S3	
	Rhyparochromidae	Cryphula trimaculata	A Seed Bug	Y			S1?	
		Ozophora picturata (Uhler)	A Seed Bug	Y			S1S3	
	Tingidae	Leptopharsa heidemanni	A Lace Bug	Y			S1	
Hymenoptera	Andrenidae	Perdita (Cockerellia) bequaerti bequaerti	A Minning Bee	Y			SNR*	
	Crabronidae	Astata nubecula	An Aculeate Wasp				SNR*	
	(Astatinae)			Υ				
	Crabronidae	Bicyrets quadrifasciatus	A Digger Wasp	Υ			SNR*	
	(Bembicinae)	Clitemnestra bipunctata	A Digger Wasp	Υ			SNR*	
		Didineis texana	A Digger Wasp	Υ			SNR*	
		Epinysson mellipes	A Digger Wasp	Y			SNR*	
		Epinysson tramosericus	A Digger Wasp	Y			SNR*	
		Epinysson tuberculatus	A Digger Wasp	Y			SNR*	
		Hoplisoides placidus	A Digger Wasp	Y			SNR*	
		Nysson simplicicornis	A Digger Wasp	Y			SNR*	
		Nysson subtilis	A Digger Wasp	Y			SNR*	

Order	Family	Scientific Name	Common Name	Present	COSEWIC	COSSARO	Srank	Legal
Hymenoptera	Crabronidae	Ectemnius dilectus	A Digger Wasp	Y			SNR*	
(continued)	(Crabroninae)	Ectemnius scaber	A Digger Wasp	Y			SNR*	
		Entomognathus lenapeorum	A Digger Wasp	Y			SNR*	
		Entomognathus memorialis	A Digger Wasp	Υ			SNR*	
		Oxybelus cressonii	A Digger Wasp	Y			SNR*	
		Oxybelus decorosus	A Digger Wasp	Y			SNR*	
		Oxybelus subcornutus	A Digger Wasp	Υ			SNR*	
		Tachysphex antennatus	A Digger Wasp	Y			SNR*	
		Tachysphex apicalis	A Digger Wasp	Y 🖉			SNR*	
		Tachytes crassus	A Digger Wasp	Y			SNR*	
		Tachytes harpax	A Digger Wasp	Υ			SNR*	
		Tachytes intermedius	A Digger Wasp	Υ			SNR*	
	Crabronidae	Diodontus virginianus	A Digger Wasp	Υ			SNR*	
	(Pemphredoninae)	Mimumesa leucopus	A Digger Wasp	Υ			SNR*	
		Mimumesa longicornis	A Digger Wasp	Υ			SNR*	
	Crabronidae	Cerceris astarte	A Digger Wasp	Υ			SNR*	
	(Philanthinae)	Cerceris cruces	A Digger Wasp	Υ			SNR*	
		Cerceris echo	A Digger Wasp	Υ			SNR*	
		Cerceris finitima	A Digger Wasp	Υ			SNR*	
		Cerceris fumipennis	A Digger Wasp	Υ			SNR*	
		Cerceris halone	A Digger Wasp	Υ			SNR*	
		Cerceris insolita	A Digger Wasp	Υ			SNR*	
		Cerceris kennicottii	A Digger Wasp	Υ			SNR*	
		Crabro snowii	A Digger Wasp	Υ			SNR*	
		Philanthus lepidus	A Digger Wasp	Υ			SNR*	
	Megachilidae	Stelis costalis	A Cuckoo Leaf-Cutting Bee	Y			SNR*	
	Sphecidae	Ammophila nigricans	A Digger Wasp	Υ			SNR*	
		Cerceris bicornuta	A Digger Wasp	Y			SNR*	
	4	Isodontia elegans	A Digger Wasp	Y			SNR*	
		Sphex pensylvanicus	A Spider Wasp	Y			SNR*	

Order	Family	Scientific Name	Common Name	Present	COSEWIC	COSSARO	Srank	Legal
Lepidoptera	Hesperiidae	Amblyscirtes hegon	Pepper and Salt Skipper	Y			S3?	
· ·	, i	Erynnis brizo	Sleepy Duskywing	Y			S1	
		Erynnis martialis	Mottled Duskywing	Y			S2	FWCA(P)
		Euphyes dukesi	Duke's Skipper	Y			S2	
		Poanes massasoit	Mulberry Wing	Y			S3	
		Thorybes bathyllus	Southern Cloudywing	Υ			S2S3	
	Lycaenidae	Satyrium caryaevorum	Hickory Hairstreak	Υ			S3S4	
	Noctuidae	Papaipema baptisiae	Wild Indigo Borer Moth	Y			S1	
		Papaipema cerussata	Ironweed Borer Moth	Y 🖉			S1	
		Papaipema sciata	Culver's-root Borer Moth	Y			S1	
	Nymphalidae	Asterocampa celtis	Hackberry Emperor	Υ			S2	
		Asterocampa clyton	Tawney Emperor	Y			S2S3	
		Danaus plexippus	Monarch	Y	SC	SC	S4	SARA(1),
								OESA(5),
								FWCA(P)
	Papilionidae	Papilio cresphontes	Giant Swallowtail	Y			S2	FWCA(P)
		Papilio glaucus	Eastern Tiger Swallowtail	Y			S4S5	FWCA(P)
		Papilio polyxenes	Black Swallowtail	Υ			S5	FWCA(P)
		Papilio Troilus	Spicebush Swallowtail	Y			S4	FWCA(P)



Order	Family	Scientific Name	Common Name	Present	COSEWIC	COSSARO	Srank	Legal
Odonata	Aeshnidae	Aeshna clepsydra	Mottled Darner	<b>?</b> E, OD			S3	
		Epiaeschna heros	Swamp Darner	Y			S2S3	
		Nasiaeschna pentacantha	Cyrano Darner	? <sup>E</sup>			S3	
	Coenagrionidae	Argia tibialis	Blue-tipped Dancer	?E			S3	
		Enallagma aspersum	Azure Bluet	Y			S3	
		Enallagma basidens	Double-striped Bluet	Υ			S3	
		Ischnura hastate	Citrine Forktail	Υ			S2	
	Gomphidae	Arigomphus villosipes	Unicorn Clubtail	?E			S1S2	
		Gomphus descriptus	Harpoon Clubtail	?⊺			S3	
		Gomphus fraternus	Midland Clubtail	? <sup>E</sup>			S3	
		Gomphus graslinellus	Pronghorn Clubtail	Υ			S2	
		Gomphus vastus	Cobra Clubtail	Υ			S1	
		Ophiogomphus carolus	Riffle Snaketail	?⊺			S2	
		Progomphus obscurus	Common Sanddragon	Υ			S1	
		Stylurus notatus	Elusive Clubtail	Υ			S2	
	Libellulidae	Celithemis eponina	Halloween Pennant	Υ			S3	
		Libellula semifasciata	Painted Skimmer	Υ			S2	
		Libellula vibrans	Great Blue Skimmer	Y			S1	
		Perithemis tenera	Eastern Amberwing	Y			S3	
	Macromiidae	Macromia taeniolata	Royal River Cruiser	Y			S1	



	INDEE 7.							
Order	Family	Scientific Name	Common Name	Present	COSEWIC	COSSARO	Srank	Legal
Orthoptera	Acrididae	Dicromorpha viridis	A Short-Winged Green				S1?	
			Grasshopper	Υ				
		Melanoplus scudderi scudderi	Scudder's short-winged				S1?	
			grasshopper	Y				
		Melanoplus walshii	A Short Horned Grasshopper	Υ			S3S4	
	Gryllidae	Anaxipha exigua	Say's Bush Cricket	Υ			S2S4	
		Neoxabea bipunctata	Two-spotted Tree Cricket	Y			S1?	
	Tettigoniidae	Microcentrum rhombifolium	A Katydid	Υ			S2S3	

TABLE 7	SUMMARY O	F SIGNIFICANT	INSECT SPECIES	POTENTIALLY	PRESENT IN	THE AOI A	ND ITS VICINITY

\*SNR – insufficient data to rank, though potentially afforded a significant rank due to new published records.

Note: Species status current to October 2007.

Present:

- Y confirmed present in the vicinity of the area of continued analysis ? possibly present in the vicinity of the area of continued analysis ?<sup>E</sup> possibly present in the vicinity of the area of continued analysis and known to occur in Essex County according to NHIC ?<sup>T</sup> possibly present in the vicinity of the area of continued analysis and know to occur in the Town of Tecumseh ?<sup>OD</sup> possibly present in the vicinity of the area of continued analysis and documented in the region by the Odonate Database, NHIC

The data presented in Table 7 represents the significant species for groups of insects which are tracked and/or have been recently documented by researchers. No doubt given the data in Table 7 and the sheer abundance of insect species likely present, numerous other significant species also occur in the vicinity of the AOI that have yet to be reported.

The Ojibway Prairie Complex and its vicinity are entomologically significant and home to many of Canada's rarest insect species and habitats. One new species of fly has recently been discovered here, and the Ojibway Prairie is also home to many rare species and new or significant records for Ontario and Canada. The area within and surrounding the Ojibway Prairie has always been an entomological gem, for amateurs and researches, and will likely continue to yield further discoveries.

Since the Ojibway Prairie is located partially in the AOI and similar habitats exist outside of the Ojibway Prairie Complex, efforts should be made to determine what further insect species of significance occur in the area. Sensitive species and locations should be identified through field investigations, further research and correspondence. Areas falling within the AOI should also be further investigated to determine if significant populations or habitat exist. Members of the entomology community should be further consulted to ascertain additional sensitivities. Impacts to Monarchs should also be further evaluated and efforts should also be taken to identify the main areas used by Monarchs for protection and/or mitigation.

#### The Entomological Importance of the Ojibway Prairie Complex and its Vicinity

The Ojibway Prairie Complex and its vicinity is a unique area composed of tallgrass prairies, savannahs, Carolinian zone vegetation, wetlands and forests. The diversity of rare habitats and plant species contributes towards the high diversity and rarity of insect species present.

The Ojibway Prairie Complex is truly one of the most entomologically unique and important areas in Canada. A review of recent publications on new records for Ontario and Canada indicates that there are many species which can only be found in the Ojibway Prairie, or at a few other locations (Buck & Marshall 2006, Buck, Paiero & Marshall 2005, Marshall, Paiero & Buck 2005, Marshall, Paiero & Lonsdale 2004, Buck 2003, Paiero & Buck 2003, Paiero & Marshall 2003, and Hamilton 1994).

New records include 16 new species for Canada and six new species for Ontario, which have only been found at the Ojibway Prairie. A further 37 new records for Canada and 29 for Ontario have only been found at the Ojibway Prairie and a few other sites. Amazingly, a new species to science was recently discovered in Ojibway Prairie (Buck & Marshall 2006). This insect, *Loxocera ojibwayensis*, is a small Psilidae fly (Diptera) that has been named after the Ojibway Prairie, which is the only known site in the world for this species. A list of the species with the new occurrence record details is provided in Table 8, including four new local records of significant Orthoptera (grasshoppers).

Order	Family	New Canadian Record & Only Site is Ojibway	New Canadian Record, with a Few Known Sites	New Ontario Record & Only Site is Ojibway	New Ontario Record, with a Few Known Sites	Significant Local Record
Diptera	Psilidae	<ul> <li>Loxocera ojibwayensis*</li> </ul>				
Hemiptera (Auchenorrhyncha)	Cicadellidae	<ul> <li>Chlorotettix fallax</li> <li>Hecalus flavidus</li> <li>Limotettix elegans</li> <li>Neokolla lugubris</li> </ul>	<ul> <li>Balclutha abdominalus</li> <li>Chlorotettix spatulatus</li> </ul>	<ul> <li>Cuema fenestella</li> <li>Xerophloea major</li> <li>Xerophloea peltata</li> </ul>	<ul> <li>Dorydiella kansaa</li> <li>Flexamia inflata</li> <li>Flexamia prairiana</li> <li>Graminella oquaka</li> <li>Graminella pallidula</li> <li>Mesamia nigridorsum</li> <li>Laevicephalus unicoloratus</li> </ul>	
	Delphacidae	🔹 Delphacodes waldeni 🔪			• Megamelus metzaria	
	Derbidae	<ul> <li>Anotia westwoodi</li> </ul>				
	Flatidae	Ormenoides venusta	Anormensis     septentrionalis			
	Membracidae	Publilia reticulata		No. of the second secon		

# TABLE 8. SUMMARY OF RECENT SIGNIFICANT RECORDS FROM OJIBWAY PRAIRIE COMPLEX VICINITY

	TABLE 6. 3	DUMMARY OF RECENT SIGN	IFICANT RECORDS FROM	I OJIBWAY PRAIRIE CO		
Order	Family	New Canadian Record & Only Site is Ojibway	New Canadian Record, with a Few Known Sites	New Ontario Record & Only Site is Ojibway	New Ontario Record, with a Few Known Sites	Significant Local Record
Hemiptera (Heteroptera)	Aradidae		Neuroctenus simplex			
	Coreidae		Chariesterus     antennator			
	Cydnidae				Pangaeus bilineatus	
	Lygaeidae	• Lygaeus turcicus (Fabricius)				
	Nabidae		Hoplistoscelis     sordidus			
	Pentatomidae	• Stiretrus anchorago fimbriatus (Say)	<ul> <li>Amaurochroa ovalis</li> <li>Dendrocoris humeralis</li> </ul>			
	Rhyparochromidae		• Cryphula trimaculata	<ul> <li>Ozophora picturata (Uhler)</li> </ul>		
	Tingidae	• Leptopharsa heidemanni				

### TABLE 9 SUMMARY OF DECENT SIGNIFICANT DECORDS FROM O HOWAY DRAIDLE COMPLEY VICINITY

Order	Family	New Canadian Record & Only Site is Ojibway	New Canadian Record, with a Few Known Sites	New Ontario Record & Only Site is Ojibway	New Ontario Record, with a Few Known Sites	Significant Local Record
Hymenoptera	Andrenidae	<ul> <li>Perdita b. bequaeti</li> </ul>				
	Crabronidae (Astatinae)				Astata nubecula	
	Crabronidae (Bembicinae)		<ul> <li>Didineis texana</li> <li>Nysson simplicicornis</li> <li>Bicyrets quadrifasciatus</li> <li>Epinysson tuberculatus</li> <li>Hoplisoides placidus</li> <li>Didineis latimana</li> <li>Epinysson</li> </ul>		<ul> <li>Clitemnestra bipunctata</li> <li>Epinysson mellipes</li> </ul>	
	Crabronidae (Crabroninae)	• Entomognathus lenapeorum	<ul> <li>Nysson subtillis</li> <li>Ectemnius scaber</li> <li>Oxybelus cressonii</li> <li>Oxybelus decorosus</li> <li>Tachytes intermedius</li> <li>Entomognathus memorialis</li> <li>Oxybelus subcornutus</li> <li>Tachytes crassus</li> <li>Tachytes harpax</li> <li>Solierella plenoculoides</li> <li>Trypoxylon attenuatum</li> </ul>	• Tachysphex apicalis	<ul> <li>Ectemnius dilectus</li> <li>Miscophus americanus</li> <li>Plenoculus davisi</li> <li>Rhopalum rufigaster</li> <li>Tachysphex antennatus</li> </ul>	

# TABLE 8. SUMMARY OF RECENT SIGNIFICANT RECORDS FROM OJIBWAY PRAIRIE COMPLEX VICINITY

				Alexandra Andrea		
Order	Family	New Canadian Record & Only Site is Ojibway	New Canadian Record, with a Few Known Sites	New Ontario Record & Only Site is Ojibway	New Ontario Record, with a Few Known Sites	Significant Local Record
Hymenoptera	Crabronidae		• Diodontus virginianus		• Diodontus minutus	
(continued)	(Pemphredoninae)		Mimumesa		Mimumesa leucopus	
			longicornis			
	Crabronidae	• Cerceris insolita	Cerceris echo	Cerceris finitima	Cerceris crucis	
	(Philanthinae)				Cerceris kennicottii	
					<ul> <li>Crabro snowii</li> </ul>	
					Cerceris astarte	
					Cerceris fumipennis	
					Cerceris halone	
					Philanthus lepidus	
	Megachilidae		Stelis costalis			
	Sphecidae		Cerceris bicornuta		• Isodontia elegans	
				N N N N N N N N N N N N N N N N N N N	Ammophila nigricans	
					• Sphex pensyvanicus	
Lepidoptera	Noctuidae	• Papaipema cerussata	Papaipema baptisiae			
		Papaipema sciata				

TABLE 8. SUMMARY OF RECENT SIGNIFICANT RECORDS FROM OJIBWAY PRAIRIE COMPLEX VICINITY



Order	Family	New Canadian Record & Only Site is Ojibway	New Canadian Record, with a Few Known Sites	New Ontario Record & Only Site is Ojibway	New Ontario Record, with a Few Known Sites	Significant Local Record
Orthoptera	Acrididae		<ul> <li>Dicromorpha viridis</li> <li>Melanoplus scudderi scudderi</li> <li>Melanoplus walshii</li> </ul>			• Melanoplus d. differentialis
	Gryllidae		Neoxabea bipunctata	$\boldsymbol{\lambda}$		<ul> <li>Anaxipha exigua</li> <li>Oecanthus niveus</li> </ul>
	Tettigoniidae					<ul> <li>Microcentrum rhombifolium</li> </ul>
Total		17*	37	6	29	4

\*The Diptera record is for a newly identified and discovered species.

# 2.3.3 Fish and Fish Habitat

# 2.3.3.1 Fish Species

Based on fisheries information provided by the Essex Region Conservation Authority (ERCA) and field investigations, a total of 21 species of fish inhabit streams located in the AOI, excluding the Detroit River. The fish community located in "inland" watercourses/waterbodies is comprised of resident warmwater sport and bait fish. Northern pike were observed spawning in several small drains located in the Chappus Road area. Table 9 presents the fish occurrence records for the watercourses containing fish as well as the historical fish records provided by ERCA.

Fish species in the Detroit River were recently sampled by four gear types (seine net, boat electrofishing, hoop net and Windemere trap) in the shallow offshore water of the Detroit River during July and August 2003 (Lapointe, Corkum and Mandrak 2005). The reach of the Detroit River sampled included Canadian waters from the confluence with Turkey Creek to the confluence with the River Canard. A total of 38 species of fish were captured. Based on this recent survey and historic fish records, a total of 69 species of fish are reported from the Detroit River. Table 10 presents the fish species known to inhabit the Detroit River.

Common Name	Scientific Name	COSEWIC	COSSARO	Srank	Basin Drain	Burke Drain	Cahill Drain	Dickson Drain	G. Marais Drain	Lennon Drain	McKee Creek	McKee Drain	Titcombe Drain	Wolfe Drain	Pond
central mudminnow	Umbra limi			S5			152	46							
northern pike	Esox lucius			S5			4					17	23		
goldfish	Carassius auratus			SE		7	152		38	153					
common carp	Cyprinus carpio			SE			152		38	>					
golden shiner	Notemigonus crysoleucas			S5			152	-							
hornyhead chub	Nocomis biguttatus	NAR	NAR	S4					38						
striped shiner	Luxilus chrysocephalus	NAR	NAR	S4	ł		152	A.							
spotfin shiner	Cyprinella spliloptera			S5		7	152								
fathead minnow	Pimephales promelas			S5	26		152		38, 150, 151	40, 153				55	
bluntnose minnow	Pimephales notatus	NAR	NAR	S5			152		38	40					
emerald shiner	Notropis atherinoides			S5			152 🖉		150						
minnow family	Cyprinidae						152			153					
white sucker	Catostomus commersoni			S5			152								
black bullhead	Ameiurus melas			S4			152				2				
black crappie	Pomoxis nigromaculatus		7	S4											Х
rock bass	Ambloplites rupestris			S5			152					2			
largemouth bass	Micropterus salmoides			S5			152		38	40					
smallmouth bass	Micropterus dolomieu			S5					38						
green sunfish	Lepomis cyanellus	NAR	NAR	S4		47	152		150, 151						
bluegill	Lepomis macrochirus			S5					38						
pumpkinseed	Lepomis gibbosus			S5			152		38	40, 153					
Note: Species status cu	rrent to October 2007.														

ABLE 9. FISH SPECIES OCCURRENCE RECORDS FOR THE AOI EXCLUDING THE DETROIT RIVE	ABLE 9.	. FISH SPECIES	OCCURRENCE	<b>RECORDS FOR</b>	R THE <mark>AOI E</mark> XC	CLUDING THE <b>C</b>	DETROIT RIVER
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Station information:

Historical: ERCA (May 2000) – 152, 153 ERCA (April 2001) –150, 151 LGL Surveys: LGL (May 2006) - 17, 23 LGL (September 2006) – 2, 26, 38, 40, 46, 47, 55, X

Common Name	Scientific Name	COSEWIC	COSSARO	Srank	Legal
sea lamprey	Petromyzon marinus			SE	
lake sturgeon	Acipenser fulvescens	NAR	NAR	S3	OESA(5)
spotted gar	Lepisosteus oculatus	THR	THR	S2	OESA(4)
longnose gar	Lepisosteus osseus			S4	OESA(3)
bowfin	Amia calva			S4	
American eel	Anguilla rostrata			S5	
alewife	Alosa pseudoharengus		Č,	SE	
gizzard shad	Dorosoma cepedianum			S4	
mooneye	Hiodon tergisus			S4	
chinook salmon	Oncorhynchus tshawytscha			SE	
coho salmon	Oncorhynchus kisutch			SE	
pink salmon	Oncorhynchus gorbuscha			SE	
rainbow trout	Oncorhynchus mykiss		1	SE	
brown trout	Salmo trutta			SE	
lake trout	Salvelinus namaycush			S5	
lake whitefish	Coregonus clupeaformis		\$	S5	
rainbow smelt	Osmerus mordax			S5	
northern pike	Esox lucius			S5	
muskellunge	Esox masquinongy			S4	
goldfish	Carrasius auratus			SE	
common carp	Cyprinus carpio		and the second se	SE	
silver chub	Macrhybopsis storeriana	SC	SC	S2	OESA(5)
golden shiner	Notemigonus crysoleucas			S5	
bluntnose minnow	Pimephales notatus	NAR	NAR	S5	
emerald shiner	Notropis atherinoides			S5	
pugnose minnow	Opsopoeodus emiliae	SC SC	SC	S2	OESA(5)
blacknose shiner	Notropis heterolepis	7		S5	
spottail shiner	Notropis hudsonius			S4	
sand shiner	Notropis stramineus			S4	
mimic shiner	Notropis volucellus			S5	
quillback	Carpiodes cyprinus			S4	
longnose sucker	Catostomus catostomus			S5	
white sucker	Catostomus commersoni			S5	
northern hog sucker	Hypentelium nigricans			S4	
bigmouth buffalo	Ictiobus cyprinellus	SC	SC	SU	OESA(5)
smallmouth buffalo	Ictiobus bubalus				
spotted sucker	Minytrema melanops	SC	SC	S2	OESA(5)
redhorse (unidentified)	Moxostoma sp.				
silver redhorse	Moxostoma anisurum			S4	
golden redhorse	Moxostoma erythrurum	NAR	NAR	S4	
shorthead redhorse	Moxostoma macrolepidotum			S5	
river redhorse	Moxostoma carinatum	SC	SC	S2	OESA(5)
yellow bullhead	Ameiurus natalis			S4	
black bullhead	Ameiurus melas			S4	
brown bullhead	Ameiurus nebulosus			S5	
channel catfish	Ictalurus punctatus			S4	
stonecat	Noturus flavus			S4	
trout-perch	Percopsis omiscomaycus			S5	
burbot	Lota lota			S5	

## TABLE 10. FISH SPECIES OCCURRENCE RECORDS FOR THE DETROIT RIVER

Common Name	Scientific Name	COSEWIC	COSSARO	Srank	Legal
banded killifish	Fundulus diaphanous			S5	
brook silverside	Labidesthes sicculus	NAR	NAR	S4	
four horn sculpin	Myoxocephalus quadricornis			S2?	
white perch	Morone Americana			SE	
white bass	Morone chrysops			S4	
rock bass	Ambloplites rupestris			S5	
green sunfish	Lepomis cyanellus	NAR	NAR	S4	
largemouth bass	Micropterus salmoides			S5	
smallmouth bass	Micropterus dolomieu			S5	
bluegill	Lepomis macrochirus			S5	
pumpkinseed	Lepomis gibbosus			S5	
black crappie	Pomoxis nigromaculatus			S4	
white crappie	Pomoxis annularis			S4	
logperch	Percina caprodes			S5	
yellow perch	Perca flavescens		4	S5	
sauger	Sander canadense		÷	S4	
walleye	Sander vitreus			S5	
freshwater drum	Aplodinotus grunniens			S5	
round goby	Neogobius melanostomus			SE	
tubenose goby	Proterorhinus marmoratus			SE	

# TABLE 10. FISH SPECIES OCCURRENCE RECORDS FOR THE DETROIT RIVER

Note: Species status current to October 2007.

# 2.3.3.2 Fish Habitat

Drainage within the AOI is provided by a number of municipal agricultural drains that flow towards the Detroit River. The major drains that transverse the access route include Cahill Drain, Lennon Drain and Grand Marais Drain (Turkey Creek) and Wolfe Drain parallels the access route on the north side of Highway 3 from the existing Highway 401 to Cahill Drain. The following watercourses/waterbodies are located in the AOI:

- Detroit River;
- Basin Drain;
- Benson Drain;
- Broadway Drain;
- Burke Drain;
- Cahill Drain;
- Collins Drain;
- Dickson Drain;
- Grand Marais Drain (Turkey Creek);
- Healy Drain;
- Lennon Drain;
- Marentette Drain;
- McKee Creek;
- No Name Drain associated with Benson Drain;
- No Name Drain associated with Susan Drain;
- No Name Drain tributary of Wolfe Drain (at Highway 401);
- No Name Drain tributary of Wolfe Drain (at Howard Ave);
- Susan Drain;
- Talbot Drain;
- Titcombe Drain;
- Wolfe Drain;
- Youngstown Drain; and
  - Unnamed pond.

All of the above listed waterbodies were surveyed for fish habitat potential. Appendix E presents a summary of the fish habitat assessment survey completed by LGL Limited in May and September 2006. The watercourses and fish habitat located in the AOI are presented in Figure 4.



LEGI	END
Maximum Footp Combined Altern	rint Area of hatives
Drainage	
Drainage - Impo	rtant Fish Habitat
Drainage - Marg	inal Fish Habitat
Drainage - Not F	Fish Habitat
Fish Habitat	
Seasonal Fish H	labitat
No Fish Habitat	
Norhannabhar	
Data Sources: I GL Limited f	iold survove, Essoy Pogion
Conservation Authourity, Spr	ring 2006 aerial photography.
WATERCOUR	SES AND FISH
HABITAT LOC	CATED IN THE
AREA OF INV	/ESTIGATION
LGL I	
environmental re	search associates
Project: TA4137	Figure: 4a
Date: February 2007	Prepared By: MWF
Scale: 1 : 10,000	Checked By: GNK
- ,	



LEG	
Combined Altern	natives
Drainage	
Drainage - Impo	ortant Fish Habitat
Drainage - Marg	jinal Fish Habitat
Drainage - Not I	Fish Habitat
Fish Habitat	
Seasonal Fish H	labitat
No Fish Habitat	
Sec. 10	
Conservation Authourity, Sp	ring 2006 aerial photography.
WATERCOUR	SES AND FISH
HABITAT LOC	
	ESTIGATION
	Limited
environmental re	esearch associates
Project: TA4137	Figure: 4b
Date: February 2007	Prepared By: MWF
Scale: 1:10,000	Checked By: GNK



		N D
	Combined Alterna	tives
	Drainage	
	Drainage - Import	ant Fish Habitat
	Drainage - Margin	al Fish Habitat
	Drainage - Not Fis	sh Habitat
	Fish Habitat	
	Seasonal Fish Ha	bitat
hd-	No Fish Habitat	
ata So	urces: LGL Limited fie	ld surveys, Essex Region
onserv	ation Authourity, Sprin	ng 2006 aerial photography
WA	TERCOURS	ES AND FISH
HA	BITAT LOC	ATED IN THE
A		ESTIGATION
		mited
	environmental res	earch associates
Projec	t: TA4137	Figure: 4c
)ate:	Fab	
	February 2007	Pronaroa BU. MANUL
•••!-	February 2007	



LEGI	
Combined Altern	rint Area of natives
Drainage	
Drainage - Impo	rtant Fish Habitat
Drainage - Marg	inal Fish Habitat
Drainage - Not F	ish Habitat
Fish Habitat	
Seasonal Fish H	abitat
No Fish Habitat	
Data Sources: LGL Limited fi Conservation Authourity, Spr	eld surveys, Essex Region ing 2006 aerial photography.
MATEROOUR	
	/FSTIGATION
/	
	imited
environmental re	esearch associates
Project: TA4137	Figure: 4d
Date: February 2007	Prepared By: MWF

Heavy impacts associated with agricultural and/or urban development affect all of these watercourses. These impacts include both physical (e.g., channelization, piping, barriers); and chemical (e.g., metals, organic compounds, nutrients) (MDNR and MOE 1991). None of the watercourses, with the exception of the Detroit River, support an important migratory fishery. Despite the extent of alteration that has occurred in watercourses located within the AOI, several of the larger watercourses continue to sustain warmwater sportfish and baitfish communities.

The Detroit River and the inland watersheds within the AOI fall under the jurisdiction of the Essex Region Conservation Authority (ERCA), the Ontario Ministry of Natural Resources (OMNR) Aylmer District and the Department of Fisheries and Oceans (DFO). Most of the inland watercourses located in the AOI have been classified as drains by the ERCA using the Agricultural Municipal Drains Class Authorization System (DFO 1999). A single unconnected pond is found at the eastern limits of the AOI. Water courses that were confirmed to support fish habitat are described below.

#### **Basin Drain**

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is permanent and supports a warmwater baitfish community downstream of the E.C. Row Expressway. Here the channelized watercourse flows through a muck and clay lined channel. Riparian vegetation consists of trees, shrubs and herbaceous vegetation. This fish habitat is considered marginal. Upstream of the E.C. Row Expressway the watercourse is mostly piped underground with a pool of open water upstream of the expressway. This upstream reach of Basin Drain is not fish habitat as the buried culvert under the expressway is a barrier to fish migration.

### Benson Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as flows were low in May and September 2006. It was determined that this watercourse likely supports a warmwater baitfish community as central mudminnow were captured downstream of South Talbot Road in Dickson Drain. This channelized watercourse flows through a clay lined channel. Riparian vegetation consists of trees, shrubs and herbaceous vegetation. This fish habitat is considered marginal.

### **Broadway Drain**

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community when flows in the Detroit River are high enough to allow fish to migrate upstream over the gravel beach barrier. Only the reach downstream of Sandwich Street was determined to be fish habitat as the hot water entering the channel from a pipe at Sandwich Street likely presents a thermal barrier to fish movement. This channelized watercourse flows through a detritus lined channel. Riparian vegetation consists of trees, shrubs and fragmites. This fish habitat is considered marginal.

### Burke Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse supports a warmwater sportfish community. This channelized watercourse flows through a detritus and muck lined channel. Riparian vegetation consists of cattails. This fish habitat is considered marginal. Downstream of South Talbot Road this watercourse was dry and is not fish habitat.

### Cahill Drain

Cahill Drain is separated into two reaches, one upstream of the confluence with Wolfe Drain, the other downstream of the confluence with Wolfe Drain. The upstream reach is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. The upstream reach is listed as a type E drain, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. LGL determined that this watercourse is permanent warmwater fish habitat. Only baitfish were captured in Wolfe Drain between the two reaches, however habitat potential exists for sportfish. Upstream of Wolfe Drain this channelized watercourse flows through a clay lined channel with herbaceous riparian vegetation. This fish habitat is considered marginal. Downstream of Wolfe Drain the channel is much larger and flows over a muck substrate. Here there is some channel definition and habitat heterogeneity. Riparian vegetation consists of trees, shrubs, and herbaceous vegetation. This fish habitat is considered important.

### **Collins Drain**

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as flows were low in May and September 2006. It was determined that this watercourse likely supports a warmwater baitfish community as fathead minnow were captured downstream in Wolfe Drain, and no barrier to fish migration exists. This channelized watercourse flows through a clay and silt lined channel. Riparian vegetation consists of cattails and fragmites. This fish habitat is considered marginal.

### **Dickson Drain**

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as flows were low in May and September 2006. It was determined that this watercourse supports a warmwater baitfish community. This channelized watercourse flows through a clay lined channel. Riparian vegetation consists of trees, shrubs and herbaceous vegetation. This fish habitat is considered marginal. The reach upstream of South Talbot Road was determined to be ephemeral and not fish habitat.

### Grand Marais Drain (Turkey Creek)

This watercourse is listed as a type E municipal drain downstream of Huron Church Road, indicating that it is permanent, the temperature regime is warmwater and sportfish are

present. The reach upstream of Huron Church Road is unclassified. LGL determined that this watercourse is permanent and supports a warmwater sportfish community. This watercourse flows through a concrete lined channel. Even though fish habitat is homogenous, it supports a relatively diverse warmwater community. There is no riparian vegetation throughout this reach as the banks are also concrete lined. This reach is regularly cleaned out to maintain flood control. Despite the presence of sportfish, this fish habitat is considered marginal as the habitat exists in a concrete lined channel.

### **Healy Drain**

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community when flows in the Detroit River are high enough to allow fish to migrate upstream over the gravel beach barrier. Only the reach downstream of Sandwich Street was determined to be fish habitat as the buried culvert under Sandwich Street is a barrier to fish movement. This channelized watercourse flows through a detritus lined channel, which is choked with fragmites. This fish habitat is considered marginal.

### Lennon Drain

This watercourse is listed as a type E municipal drain downstream of Huron Church Road, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. LGL determined that this watercourse is permanent and supports a warmwater sportfish community. Upstream of Talbot Road, the channelized watercourse flows through a silt, clay and geotextile substrate, with manicured grasses and a few trees as riparian vegetation. Between Talbot Road and Huron Church Line, the channelized watercourse flows through a riprap lined channel with herbaceous vegetation and a few shrubs providing shade to the channel. Downstream of Huron Church Line the watercourse flows through a clay channel with manicured grasses and a few trees as riparian vegetation. This fish habitat is considered important.

### McKee Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community as a northern pike was observed upstream of the E.C. Row Expressway in May 2006. This channelized watercourse flows through a muck and detritus lined channel, which is choked with fragmites. Upstream of Matchette Road the watercourse is piped under a residential property. This pipe is a barrier to fish migration and the watercourse upstream of this pipe is not fish habitat. This fish habitat is considered important.

### McKee Creek

This watercourse is listed as a type E municipal drain downstream of Sandwich Street, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. The reach upstream of Sandwich Street is listed as a type F drain, indicating that

it is intermittent, the temperature regime and potential fish species are unknown. LGL determined that this watercourse is permanent and supports a warmwater sportfish community. This channelized watercourse flows through a muck lined channel. The banks upstream of Sandwich Street are lined with sheet piling. The riparian vegetation consists of fragmites, cattails, and herbaceous vegetation. Downstream of Sandwich Street, the channel flows through a series of double culverts and flows into a canal. A local fisherman indicated that in the spring walleye and perch often migrate upstream but are limited by the size of the double culverts and most cannot make it past this barrier. The removal of this barrier presents an excellent opportunity for habitat enhancement. This fish habitat is considered important.

### **Titcombe Drain**

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community as a northern pike was observed in May 2006. This channelized watercourse flows through a silt and detritus lined channel. Riparian vegetation consists of trees, shrubs, herbaceous vegetation and manicured grasses. This fish habitat is considered important.

### Wolfe Drain

Downstream of the confluence with Cahill Drain, the watercourse is listed as a type E municipal drain, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. Upstream of the confluence with Cahill Drain, the watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse supports permanent warmwater baitfish habitat as flows were moderate in May and September 2006. Only baitfish were captured upstream of Talbot Road, however habitat potential exists for sportfish. This channelized watercourse flows through a clay lined channel. There is very little habitat heterogeneity. Riparian vegetation consists of shrubs, trees, and herbaceous vegetation. This fish habitat is considered important.

### Youngstown Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. LGL determined that this watercourse is likely intermittent as there was little flow in May and September 2006. It was determined that this watercourse likely supports a seasonal fish community. This channelized watercourse flows through a silt lined channel. Riparian vegetation consists mainly of herbaceous species. This fish habitat is considered marginal.

### **Unnamed Pond**

This waterbody is unclassified. LGL determined the waterbody to be permanent and to support a warmwater sportfish community. It appears to be man-made and it is not connected to any nearby drains. Substrate in the pond appears to be clay and muck. A few riparian trees and shrubs are found around the pond. This fish habitat is considered important.

### Detroit River

Previous reports indicate that at least 69 species of fish inhabit the Detroit River (Manny *et al.* 1988 *in* MDNR; MOE 1991 and LaPointe, Corkum and Mandrak 2005). These species are listed in Table 10 and include many sportfish as well as migratory species that use the river to move between Lakes Erie and St. Clair. Diverse habitat exists within the river, especially in the wetlands which are used by warmwater species for many of their life functions (spawning, nursery, foraging). Several provincially significant wetlands exist within the river or are associated with tributary river mouths. These wetlands cover an area of 462.5 ha. As reported in MDNR and MOE (1991), 41 fish species have been reported to spawn within the Detroit River and an additional seven species are suspected of spawning. Manny *et al.* (1988 *in* MDNR and MOE 1991) reported that 25 species use the river as nursery habitat, including both warm and coldwater species.

The investigation in the vicinity of possible bridge piers was compromised by turbid water conditions. Strong northeast winds stirred up sediment in Lake St. Clair which was conveyed downstream in the Detroit River. As a result, visibility was reduced to less than 20 cm. For this reason, the camera, which is equipped with strong LED lights, did not record many features of the Detroit River bottom as it requires relatively clear water to operate. The strong current also made proper deployment difficult. Despite these problems, some substrate features were recorded intermittently by the underwater camera. These included short aquatic vegetation which was rooted to the substrates and details that enabled the camera to discern clay, sand and gravel substrates. No large or distinct habitat features (i.e. boulders, logs, etc.) were observed. The Ekman dredge did not deploy correctly due to the strong current and great depth (10-15 m). As a result, no full grab samples were taken. However, some substrate was attached to the Ekman as it was on the bottom of the river and consisted of clay and a clay/sand mix. The low-lying aquatic vegetation seen on the underwater video was also attached to some of the grab samples. The fish habitat in the Detroit River in the vicinity of the bridge piers is considered important.

2.3.3.3

# **Benthic Invertebrates**

The Hilsenhoff Biotic Index (HBI) was used to evaluate water quality at benthic sampling stations. HBI values give us an indication of the levels of organic pollution in the water. Other metrics were also used to interpret water quality and habitat conditions at these stations such as species richness and percentage of intolerant species. Table 11 provides a summary of the metrics and HBI values for combined replicates for sampling stations. Results from individual replicates are not shown as they had too few organisms in each sample to analyze HBI values. Stations 2, 7 and 8 are located on watercourses found outside the AOI; therefore, they are not described.

The benthic surveys reveal that the habitat quality at all sampling stations is poor. All stations have been highly altered. Stations 1 and 6 in Cahill Drain have been channelized. Stations 3 and 4 in Turkey Creek have been straightened and have a concrete channel. Station 5 in Turkey Creek has had gabion reinforcement of the bank. Station 9 in Lennon Drain has been channelized and filled with rip rap material.

	Station 1 Cahill Drain	Station 3 Turkey	Station 4 Turkey	Station 5 Turkey	Station 6 Cahill Drain	Station 9 Lennon
		Сгеек	Сгеек	Сгеек		Drain
Date sampled	9March05	9March05	10March05	10March05	10March05	10March05
abundance	338	256	196	125	293	347
richness	16	15	4	7	8	14
EPT abundance	5	0	0	2	0	0
EPT richness	2	0	0	1	0	0
% EPT	1.48%	0.00%	0.00%%	1.60%	0.00%	0.00%
# intolerant	2	3	1	1	0	2
% tolerant	80.00%	73.73%	75.00%	80.00%	100.00%	75.00%
% oligochaetes	26.63%	50.78%	0.00%	2.40%	6.83%	6.63%
% grazers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HBI	6.80	6.14	5.98	7.43	6.18	7.36
Water quality	Fairly Poor	Fair	Fair	Fairly Poor	Fair	Fairly Poor

### TABLE 11. SUMMARY OF BENTHIC DATA FOR STATIONS LOCATED IN THE AOI

Station 1 – Cahill Drain Downstream of Huron Church Line

Habitat conditions at this station were homogeneous. Substrate consisted of mainly silt. Riparian vegetation was composed of old field species with some shrubs and trees.

Water quality rating from the HBI value for this station was Fairly Poor. This indicates that there is significant organic pollution at this station. One species of mayfly (Ephemeroptera), and one species of caddisfly (Trichoptera) were found at this station. These organisms are usually indicators of good water quality, however the mayfly genus *Caenis* found at this station is tolerant of degraded habitat conditions. Percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. Oligochaetes (worms) are found in habitats with fine sediments and a higher oxygen demand. The high percentage of oligochaetes at this station is an indicator of the poor habitat conditions. The lack of grazers at this station is an indicator of the lack of allochtonous material (such as leaf litter) in this system.

### Station 3 - Turkey Creek Downstream of Huron Church Road

Habitat conditions at this station were homogeneous. Substrate consisted of a concrete channel with some gravel, sand, and silt. Riparian vegetation was limited to old field species along the concrete banks. Upstream of the sample station, there is no riparian vegetation as the banks are concrete.

Water quality rating from the HBI value for this station was Fair. This indicates that there is fairly significant organic pollution at this station. No mayflies (Ephemeroptera), stoneflies (Plecoptera), or caddisflies (Trichoptera) were found at this station. These organisms are usually indicators of good water quality. Their absence may indicate that water quality at this station is poor. Percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. The high percentage of oligochaetes at this station is an indicator of the poor habitat conditions. The lack of grazers at this station is an indicator of the lack of allochtonous material (such as leaf litter) in this system.

#### Station 4 - Turkey Creek Downstream of Dominion Boulevard

Habitat conditions at this station were homogeneous. Substrate consisted of a concrete channel with some sand, and silt deposits. There was no riparian vegetation as the banks were concrete.

Water quality rating from the HBI value for this station was Fair. This indicates that there is fairly significant organic pollution at this station. Species richness was low at this station indicating that habitat diversity is low and conditions are degraded. No mayflies, stoneflies, or caddisflies were found at this station. Their absence may indicate that water quality at this station is poor. Percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. Chironomids accounted for 99.5% of the sample. These organisms occupy the same habitat niche as the oligochaetes indicating the poor habitat conditions at this station. The lack of grazers at this station is an indicator of the lack of allochtonous material (such as leaf litter) in this system.

### Station 5 – Turkey Creek Downstream of Malden Road

Habitat conditions at this station were more diverse then the rest of the stations. Substrate consisted of mainly silt with some cobble. Riparian vegetation was composed of old field species with some shrubs. Only one replicate was taken at this station, as only one transect downstream of the bridge was shallow enough to wade. Water depth was high upstream and downstream of the bridge.

Water quality rating from the HBI value for this station was Fair. This indicates that there is fairly significant organic pollution at this station. Species richness was low at this station indicating that habitat diversity low and conditions are degraded. One species of caddisfly was found at this station that is somewhat intolerant of degraded habitat conditions. Percentage of tolerant organisms at this station was very high indicating that the species present are tolerant of poor habitat and water quality conditions. The lack of grazers at this station is an indicator of the lack of allochtonous material (such as leaf litter) in this system.

### Station 6 – Cahill Drain Downstream of Malden Road

Habitat conditions at this station were homogeneous. Substrate consisted of mainly sand and silt. Riparian vegetation was composed of old field species with some shrubs.

Water quality rating from the HBI value for this station was Fair. This indicates that there is fairly significant organic pollution at this station. Species richness was low at this station indicating that habitat diversity low and conditions are degraded. No mayflies, stoneflies, or caddisflies were found at this station. Their absence may indicate that water quality at this station is poor. Percentage of tolerant organisms was 100%, indicating that the species present are tolerant of poor habitat and water quality conditions. The lack of grazers at this station is an indicator of the lack of allochtonous material (such as leaf litter) in this system.

### Station 9 – Lennon Drain Downstream of Huron Church Line

Habitat conditions at this station were homogeneous. Substrate consisted of rip rap. Riparian vegetation was composed of old field species with some shrubs.

Water quality rating from the HBI value for this station was Fairly Poor. This indicates that there is significant organic pollution at this station. No mayflies, stoneflies, or caddisflies were found at this station. Their absence may indicate that water quality at this station is poor. Percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. The lack of grazers at this station is an indicator of the lack of allochtonous material (such as leaf litter) in this system.

# 2.3.3.4 Species at Risk

Six species of fish are listed as Endangered, Threatened or Special Concern by COSEWIC and COSSARO and eight are regulated under the new OESA. No species at risk are reported from "inland" watercourses located within the AOI. Spotted gar (Lepisosteus oculatus) is ranked S2 and is listed as Threatened by both COSEWIC and COSSARO. Its general provincial status is "at risk" likely due to its restricted range within Ontario, and it is tracked by the NHIC. Lake sturgeon (Acipenser fulvescens) is ranked as S3 and is currently listed as Not at Risk by COSEWIC and COSSARO; however, lake sturgeon is regulated under Schedule 5 of the new OESA. Longnose gar (Lepisosteus osseus) is ranked S4 and is not currently listed by COSEWIC or COSSARO, however, longnose gar is regulated under Schedule 3 of the new OESA. Two cyprinid species reported from the Detroit River are also considered to be at risk: silver chub (Macrhybopsis storeriana) and pugnose minnow (Opsopoeodus emiliae). Both are ranked S2 and are considered of Special Concern by COSEWIC and COSSARO and regulated under Schedule 5 of the new OESA. Both are currently tracked by the NHIC and have a general provincial status of "sensitive". The last three species of concern are in the sucker family: bigmouth buffalo (Ictiobus cyprinellus), spotted sucker (Minytrema melanops) and river redhorse (Moxostoma carinatum). The bigmouth buffalo is ranked SU, meaning that it is unrankable at this time as more data is needed. The spotted sucker and river redhorse are both ranked S2. All three of these fish species are listed as Special Concern by COSEWIC and COSSARO and all three are regulated under Schedule 5 of the new OESA. The general provincial status of the bigmouth buffalo is "undetermined" and the river redhorse general provincial status is "sensitive". The location of the possible bridge piers does not support critical habitat for any of these known species at risk.

# 2.3.4 Wildlife and Wildlife Habitat

## 2.3.4.1 Wildlife Species

The natural heritage features of the AOI were divided into 124 wildlife habitat units. These units formed the basic habitats around which most of the terrestrial vertebrates were recorded, SARA species were searched for and priority species of conservation concern were noted. Four continuous seasons of data collection and in-field wildlife investigations within and around these wildlife units resulted in the compilation of 139 species (11 herpetofauna, 108 birds and 20 mammals). A list of terrestrial vertebrates recorded in the AOI is presented in Appendix F.

Four amphibian species and seven reptile species were recorded in the AOI. Amphibians include frogs and toads since no salamanders were located anywhere in the the AOI. The absence of salamanders from the AOI was expected based on discussions with local experts and review of secondary information.

The majority of the amphibians were found at specific vernal ponds and creek drains during the breeding season. As a result, these locations were identified as important amphibian breeding areas. American toad (*Bufo americanus*) and/or western chorus frog (*Pseudacris triseriata*) were found in most of the breeding areas recorded. Only one pond, located near the east limits of the AOI, had green frog (*Rana clamitans*) egg masses. Chorus frogs were located predominantly in or around vernal pools within woodlots, whereas American toads and green frogs preferred ponds or creek drains in open areas. No leopard frog egg masses were found in any of the ponds investigated although adults were seen around creek drains throughout the summer.

Of the reptiles observed, snakes were recorded most often. The eastern foxsnake (*Elaphe* gloyd) was recorded on numerous occasions in wooded areas, along creeks, under buildings or under log piles in residential backyards. The other four species were located in tallgrass prairies, cultural meadows and cultural thickets under boards, tiles, rocks, or whatever they could hide under during the evenings and early mornings. Of these, Butler's gartersnake (Thamnophis butleri) was recorded only in the open tallgrass prairie (TPO2-1) habitats between Chappus Road and E.C. Row Expressway. Based on discussions with local experts, Butler's gartersnake was present in Malden Park prior to the construction of the E.C. Row Expressway and conversion of Malden Park into parkland. However, this population has been extirpated from Malden Park and one of the few remaining areas for Butler's gartersnake outside of the Ojibway Prairie is the area between Chappus Road and the E.C. Row Expressway. This species has a strong affinity to prairie communities and a very small home range; therefore, it is very sensitive to habitat loss. A migrating painted turtle (Chrysemys picta) was found along Broadway Street just north of the Black Oak Woods. A snapping turtle (Chelydra serpentina) was observed in a creek drain north of Armanda Street near the east Chappus Road extension.

Birds comprised 108 of the 139 wildlife species recorded, with representatives in every habitat. Field survey data showed that 50 of these species were breeding birds that nested in about 75 % of the designated wildlife habitat units. The results of the breeding bird survey are presented in Appendix G. A list of the bird species recorded during the

point-count surveys is presented in Appendix H. Most of the remaining 58 species, observed primarily in the spring and fall seasons, were considered non-residents or migrants. These migrants were observed moving through the western two-thirds of the area of investigation, using the Detroit River, Black Oak Woods, Ojibway Park, Ojibway Prairie Provincial Nature Reserve, Spring Garden Forest, the deciduous forests around Reddock Avenue and the St. Clair College Prairie ESA as migration corridors. Many of the forests, woodlots and cultural thickets, north of these major natural heritage features and within the area of investigation, were being used as continuations of these major north-south migration corridors. Areas like the forests, woodlots and cultural thickets of Brighton Beach, the Malden Park forest connecting with the woodlots and cultural thickets around Chappus Street, the woodlots around E.C. Row Expressway just north of Spring Garden Park and the woodlots and cultural thickets on the south side of Talbot Road opposite St. Clair College, all contained hundreds of migrating birds during the spring and fall seasons and contributed to the continuation of a series of bird migration corridors going through the AOI. The entire AOI is located within two continental bird migration corridors associated with the Atlantic and Mississippi Flyways. The large forest on the west side of Huron Church Road, just south of Turkey Creek (north and south of Reddock Avenue) was identified as a stop-over area for birds of prey on migration. Hundreds of Broad-winged Hawks (Buteo platypterus), Red-tailed Hawks (Buteo jamaicensis), Coopers Hawk (Accipter cooperil), Goshawk (Accipiter gentilis) and Turkey Vultures (*Cathartes aura*) stopped in this forest to roost while on their journey southward.

Two species of swallows were located on the Turkey Creek Bridge on Huron Church Road. Up to 20 nests were found on the ceiling cross beams but only 11 were considered active at the time of investigation. Eight Barn Swallow (*Hirundo rustica*) nests, located on the ceiling beams at the center of the bridge, and three Cliff Swallow (*Petrochelidon pyrrhonota*) nests, located on the outside ceiling beams, were recorded.

Two wildlife units contained a large number of migratory bird nests as compared to most of the other units. W-BBA9 and W-NSG7 contained multiple nests from species such as Brown Trasher (*Toxostoma rufum*), Gray Catbird (*Dumetella carolinensis*), American Robin (*Turdus migratorius*), American Goldfinch (*Carduelis tristis*), Willow Flycatcher (*Empidonax trailli*), Yellow Warbler (*Dendroica petechia*) and Mourning Dove (*Zenaida macroura*). The diversity of migratory bird species centralized in such small areas makes these habitats highly important.

Based primarily on evidence from signs such as trails, tracks, scats, smells, sounds, etc., evidence for mammal activity was recorded in every habitat type. Incidental observations were made of red fox (*Vulpes vulpes*) carrying food to their pups in wildlife unit W-BBA9 and 3 fox pups playing in the early morning hours opposite W-BBA4. The only European hare (*Lepus europaeus*) recorded was spotted in the cultural meadow of W-BBA20 whereas eastern cottontails (*Sylvilagus floridanus*) were observed in open areas thoughout the AOI. Individuals were seen moving through the cultural meadows in W-CH12 and W-LAM6 or feeding around human habitations such as St. Clair College or the residence front lawns along Montgomery Drive just west of Talbot Road. Grey squirrel (*Sciurus carolinensis*) dreys were found in nearly every forest and woodlot. The abundance of raccoons (*Procyon lotor*) was recorded primarily from observing their trails and tracks going from habitat to habitat. White-tailed deer (*Odocoileus virginianus*) was also recorded in nearly every habitat type. Tracks, trails, scats, bedding areas and direct observations indicated their presence in cultural meadows, cultural thickets, marshes and forests throughout the AOI. Road kills were another method used to determine mammal

presence in particular habitats. Opossums (*Didelphis virginianus*) were found along Broadway Street just east of Ojibway Parkway and along Talbot Road next to a meadow marsh on the south side of the Heritage Park Alliance Church.

Migration corridors for mammals were seen through every habitat and connecting each of the habitat types. Of particular note, the Cahill Drain, connecting the St. Clair College Prairie ESA on the north side of Highway 3 to the deciduous swamp located on the south side of Highway 3 was heavily traveled by mammals in both summer and winter. Tracks of small mammals, muskrat (*Ondatra zibethica*), red fox, coyote (*Canis latrans*) and raccoon were recorded along Cahill Drain and under Highway 3 going in both directions. White-tailed deer showed no evidence of travel through the culvert but used the creek drain for travel on the north side of Highway 3. The fact that corridors were so abundant indicated high mammal activity and the importance of the remaining natural heritage features found in the AOI.

Winter investigations indicated that most of the AOI had a limited amount of wildlife activity. Herpetofauna were in hibernation and most of the breeding bird species had left the area. Only a few winter bird species remained using particular habitats as winter feeding areas. Trails and tracks showed that a few mammal species used certain portions of the AOI for traveling and bedding down. Fox and coyote used frozen creek drains, open fields and human made paths through woodlots for winter travel. Raccoons, especially during their late winter breeding season, travelled from woodlot to wooldlot. Random white-tailed deer travel corridors, to and from feeding areas, existed in the forests and cultural thickets between Turkey Creek and Cabana Road, between Spring Garden Road and E.C. Row Expressway and between Armanda Street and E.C. Row Expressway. Only a few deer bedding areas found in the AOI were located in the forested area of wildlife unit W-CH2 around Chappus Road north of Armanda Street. Most of the deer bedding areas appeared to be outside the AOI, concentrated in the Spring Garden Forest ANSI, while most of the feeding areas appeared to be in the AOI.

2.3.4.2

# Wildlife Habitat

All the wildlife units contained one or more of 13 habitat types recognized in the AOI. These habitat types are described below. A detailed assessment of the significance of each wildlife habitat unit is presented in Appendix I. By analyzing each of the habitat types throughout the AOI, a pattern of species composition per habitat type became evident. The location of wildlife habitat units located in the AOI is presented in Figure 5.


# LEGEND Maximum Footprint Area of Combined Alternatives Wildlife Habitat Unit Data Sources: LGL Limited field surveys, Spring 2006 aerial photography. WILDLIFE HABITAT UNITS LOCATED IN THE AREA OF INVESTIGATION LGL Limited environmental research associates (Project: TA4137 Figure: 5a Date: February 2007 Prepared By: MWF

Scale: 1 : 10,000

Checked By: GNK



LEGEND
Maximum Footprint Area of Combined Alternatives Wildlife Habitat Unit
Data Sources: LGL Limited field surveys, Spring 2006 aerial photography.

## WILDLIFE HABITAT UNITS LOCATED IN THE AREA OF INVESTIGATION



Project	: TA4137	Figure:	5b
Date:	February 2007	Prepared B	<b>y:</b> MWF
Scale:	1 : 10,000	Checked By	/: GNK





LEGEND

Maximum Footprint Area of Combined Alternatives



#### **Deciduous Forests and Cultural Woodlots**

Many wildlife species used the deciduous forests (FOD) and cultural woodlots (CUW) as migration corridors, living spaces and breeding areas. Besides their use for the seasonal migration of birds (noted above), mammals regularly used these habitats as corridors for daily movements to and from their feeding and resting areas in various habitats. Small mammals, red fox (Vulpes vulpes), raccoon (Procyon lotor), and white-tailed deer (Odocoileus virginianus) are a few species that used FODs and CUWs as a food source. Raccoons and other small mammals also used specific trees within the habitat for hibernation den sites while white-tailed deer used certain areas for winter deer yards protecting them from the elements. Forests and woodlots were also important breeding areas for wildlife. Chorus frogs were recorded calling and breeding at many of the vernal ponds found within some of these woodlots. Up to 23 species of migratory birds, many considered species of conservation priority, were recorded using the forests and woodlots for nest sites. Red-tailed Hawk, Eastern Wood Pewee (Contopus virens) and Baltimore Oriole (Icterus galbula) nested in the forest canopies while the understory contained nests of Indigo Bunting (Passerina cyanea), Wood Thrush (Hylocichla mustelina) and American Robin to name a few. Cavities in the trunks of dead standing trees were used by Tree Swallows (Tachycineta bicolor) and Black-capped Chickadees (Poecile atricapillus), whereas Downy Woodpecker (Picoides pubescens) and Northern Flicker (Colaptes auratus) excavated their own cavities in the trunks of live trees. Many of the woodlot trees were also used as den sites by small mammals and raccoons and dreys were constructed in them by gray squirrels (Sciurus carolinensis) for raising their young.

#### **Cultural Thickets**

Being continuations of the some of the larger fragmented FOD and CUW migration corridors, cultural thickets (CUT) were also used by migratory birds as stop over areas for feeding while on their seasonal migrations. Many CUTs surrounded creek drains and provided protection from the elements for amphibian species breeding there. Numerous garter snakes (*Thomnophis sirtalis*) were recorded using this habitat for hunting during the day and hiding through the night. CUTs also linked larger habitats together so mammals used them as daily movement corridors from feeding areas to resting areas. Track evidence through corridors showed heavy use of CUTs by raccoon, red fox, coyote (*Canis latrans*) and white-tailed deer. Of most importance, CUTs provided a large number of breeding birds with a well protected habitat for their nests. Up to 14 species of migratory birds were recorded to use CUTs in the AOI for breeding. For example, wildlife unit W-NSG7 recorded numerous Gray Catbird nests, plus nests of Yellow Warbler, American Goldfinch and American Robin. Breeding bird evidence then accounted for another three to four species added to this unit.

#### **Cultural Meadows**

Cultural meadows (CUM), found in more wildlife units in the AOI than any other habitat, were used by wildlife as migration corridors, feeding and breeding areas. American toads were recorded many times in the habitat using it as a food source while Dekay's brown snakes (*Storeria decayi*) were recorded migrating through it to get to a wetter forest environment. Grassland bird species were recorded using these CUMs for food sources with increased numbers recorded during the migration periods. This habitat is also a breeding area for bird species such as Field Sparrow (*Spizella pusilla*), Savannah Sparrow (*Passerculus sandwichensis*) and Eastern Kingbird (*Tyrannus tyrannus*). White-

tailed deer bedding areas were found throughout numerous CUMs in the area of investigation as were trails and tracks of raccoon, fox and coyote using these habitats as a travel corridors and feeding zones.

#### Cultural Savannahs

Ten cultural savannahs were identified as wildlife habitat units. Breeding evidence for at least 12 species of migratory birds, such as Orchard Oriole (*Icterus spurius*), Gray Catbird, American Goldfinch, Willow Flycatcher and Yellow Warbler, was found. Numerous mammal corridors extended through these habitats connecting feeding areas and dwelling areas in surrounding habitats.

#### **Tallgrass Prairies**

Although represented in numerous wildlife units within the area of investigation, the area each tallgrass prairie (TPO) represents is relatively small in comparison to other habitats. However, they contain some of the most unique wildlife species. Every snake species recorded in the AOI was found in the TPO habitats. Snakes used this habitat for hunting their prey and as corridors to neighboring habitats. Two of these species, Butler's gartersnake and eastern foxsnake, are regulated under SARA. Bird nests and breeding bird behaviours indicated that species, such as Willow Flycatcher and Field Sparrow, nested in this habitat. Trail evidence also indicated that the TPO's were used by mammals as potential feeding areas and as movement corridors among surrounding habitats.

#### Meadow Marsh and Shallow Marsh

These meadows (MAM and MAS) attract wildlife species dependant on a greater amount of water during their life cycle. Many snake species, like foxsnakes, are attracted to these habitats for a food source. Up to 15 species of birds were recorded within MAMs and MASs of the AOI. Some species recorded, like American Woodcock (*Scolopax minor*), Yellow Warbler and Common Yellowthroat (*Geothlypis trichas*), prefer to breed in this type of habitat. Numerous mammal species, like cottontail (*Sylvilagus floridanus*), opossum (*Didelphis virginianus*), raccoon and deer used these habitats for feeding. Numerous trails throughout these habitats also showed their use as movement corridors among surrounding habitats.

#### **Deciduous Swamps**

Four wildlife units contained deciduous swamps (SWD). A combination of both forest and wetland species, such as Baltimore Oriole, Common Grackle (*Quiscalus quiscula*), Carolina Wren, Cooper's Hawk, Common Yellowthroat and Song Sparrow, were recorded. Trails and tracks from deer, coyote and raccoon were also observed.

#### **Cultural Plantations**

Not known for their biodiversity, cultural plantations (CUP) recorded a limited variety of wildlife. Foxsnakes were recorded moving through these habitats when located next to human residences. No breeding birds were recorded within these habitats but several species were observed using them as feeding areas. Mammals used them as protective migration corridors moving to and from surrounding habitats.

#### **Open Water**

The only open water (OAO) found was a pond in one of the agricultural areas. Trails leading to the pond indicated its use as a water and food source for mammals. Amphibians, such as green frog, bred there because it is a permanent water source. Birds, such as tree swallows, fed over the water and appeared to be nesting in the dead trees located on the northwest side of the pond.

#### **Agricultural Areas**

These areas are not recognized by the ecological land classification system (ELC), but were recorded as wildlife habitat units because of their uniquess as breeding habitats to many species of birds. Found predominantly at the east end of the AOI, bird species such as Horned Larks (*Eremophila alpestris*), Killdeer (*Charadrius vociferus*), Spotted Sandpiper (*Actitis macularius*) and Vesper Sparrow (*Pooecetes gramineus*), used these tilled open fields to nest in. The edges of these agricultural fields consisted of tree rows, thickets and creek drains that provided additional nesting habitats. Kingbirds, Savannah Sparrows, Song Sparrows (*Melospiza melodia*), Canada Geese (*Branta canadensis*) and Mallard (*Anas platyrhynchos*) were all recorded nesting on the periphery of these agricultural fields.

#### **Residential Areas**

Also not recognized by ELC, these wildlife habitat units contained wildlife species particularly adapted to human presence. Snakes, such as the foxsnake, were recorded dwelling in backyard wood piles or under garages of individual homes. Birds, like Catbirds, Chipping Sparrows (*Spizella passerina*) and Mourning Doves, nested on or in close proximity to the residences themselves. Opportunistic mammals, like white-tailed deer, raccoon, striped skunk (*Mephitis mephitis*) and eastern chipmunk (*Tamias striatus*) used residential areas for foraging and den sites.

#### 2.3.4.3

## Species at Risk

None of the amphibians recorded in the AOI are listed by COSEWIC or COSSARO or regulated by legislation. Four of the reptile species are regulated under the FWCA. Two of these species, Butler's gartersnake and eastern foxsnake, are also regulated as Schedule 1 under the SARA and Schedule 4 under the new OESA. Butler's gartersnake was found in two separate locations on the south side of E.C. Row Expressway in wildlife units W-CH10 and W-CH22. Three foxsnakes were observed in two different field locations while another three were reported by local residents in two separate residential areas. Two of the three foxsnakes found during the investigations were located along the shoreline of Turkey Creek just west of the Huron Church Road Bridge. The other was found basking on the asphalt walkway just south of Spring Garden Road at the northwest corner of wildlife habitat unit W-LAM1. Two of the residential reports were in the woodlot and a residence backyard on the north side of Armanda Street, while the other was reported dwelling under the back corner of a garage next to a residence along the north side of Reddock Street just west of Huron Church Road. Both of these residential locations were verified by local biologists. The eastern Massasauga (Sistrurus catenatus catenatus) and the eastern hog-nosed snake (Heterodon platirhinos), both listed as Threatened by COSEWIC and COSSARO and regulated under the FWCA, Schedule 1 of

SARA, and Schedule 4 of the new OESA, occur in the Ojibway Prairie Complex, but none were observed during field investigations.

The *Migratory Birds Convention Act* (MBCA) regulates 90 of the 108 bird species recorded. The FWCA regulates eleven species, primarily the birds of prey. The only avian species regulated by SARA is the Red-headed Woodpecker found in the Black Oak Woods between Ojibway Parkway and Matchette Road. The Red-headed Woodpecker is listed as Threatened by COSEWIC and Special Concern by COSSARO and regulated under Schedule 3 of SARA and Schedule 5 of the new OESA. The Red-headed Woodpecker is about to be uplisted to Schedule 1 of SARA. The Golden-winged Warbler, which was observed as a migrant in the AOI is regulated under Schedule 5 of the new OESA. Locally, 38 bird species are considered priority species of conservation concern by Bird Studies Canada for Essex County. Of these, 32 species are ranked as highly sensitive to any disturbances in or around their habitat.

Fifteen of the mammals recorded are regulated under the FWCA. No mammal species found in the area of investigation are regulated under SARA or the new OESA. The status of terrestrial vertebrate species recorded in the AOI is presented in Appendix F.

## 2.3.5 Designated Natural Areas

A number of Areas of Natural and Scientific Interest (ANSIs) and Environmentally Significant Areas (ESAs) and one Provincial Nature Reserve are located within the AOI. One of these natural heritage features has also been evaluated by Carolinian Canada. In addition, the City of Windsor and the Town of LaSalle have both undertaken biological inventories of the remnant forest and prairie habitat features not already designated and afforded some form of protection in planning documents to determine if these areas should be included under an Open Space/Greenway system policy. These areas are referred to as Candidate Natural Heritage Sites (CNHSs). This section provides a summary of these designated natural areas located in the AOI and its vicinity. The location of designated natural areas is presented in Figure 6.

2.3.5.1

#### Provincial Nature Reserve

Provincial Nature Reserves are areas selected to represent the distinctive natural communities and landforms in Ontario. Ojibway Prairie is a 65 ha Provincial Nature Reserve that was regulated under the *Provincial Parks Act* in 1977 to protect one of the largest remnants of tallgrass prairie and oak savannah in Ontario (OMNR 2002). The dominant feature of this nature reserve is the tallgrass prairie plant community. Within the Ojibway Prairie Provincial Nature Reserve, 533 flowering plant species have been documented, of which over 60 are of prairie and western affinity. It is home to over 60 plants that are rare in Ontario as well as a number of animal species representative of prairie habitats (Pratt 1979; OMNR 2002). The Ojibway Prairie Provincial Nature Reserve forms one component of the Ojibway Prairie Complex ANSI.



## LEGEND

Maximum Footprint Area of Combined Alternatives Area of Natural and Scientific Interest

Candidate Natural Heritage Site

Environmentally Significant Area

Data Sources: LGL Limited field surveys, Spring 2006 aerial photography.

#### DESIGNATED NATURAL AREAS LOCATED IN THE AREA OF INVESTIGATION



Project	: TA4137	Figure:	6
Date:	February 2007	Prepared E	By: MWF
Scale:	1 : 35,000	Checked B	sy: GNK

Vegetation communities in the Provincial Nature Reserve include Old Field (27.5 ha), Forb Prairie (17 ha), Tallgrass Prairie (11.5 ha), Thickets (3 ha), Oak Savannah (4.5 ha), and Black Oak/Red Hickory Forest (1.5 ha). While some early successional tallgrass prairie species occur in Old Field communities, the majority of species with a prairie affinity are located within the remaining vegetation communities. The Provincial Nature Reserve contains two vegetation communities that are globally and provincially rare. Moist-Fresh Tallgrass Prairie Type (TPO2-1) and Moist-Fresh Black Oak Tallgrass Savannah Type (TPS2) both have a global rank of G1 (Extremely Rare – having less than five occurrences in the overall range) and a provincial rank of S1 (Extremely Rare in Ontario – having less than five occurrences in the province).

The Provincial Nature Reserve provides habitat for three nationally and provincially Threatened wildlife species regulated under SARA and the new OESA including eastern foxsnake (*Elpahe gloydi*), Butler's gartersnake (*Thamnophis butleri*) and eastern hognosed snake (*Heterodon platirhinos*). Purple twayblade (*Liparis liliifolia*) and eastern prairire fringed orchid (*Platanthera leucophaea*), both nationally and provincially Endangered and regulated under SARA and the new OESA, are present in the reserve. Colic-root (*Aletris farinosa*) and willowleaf aster (*Symphotrichum praealtum*), both nationally and provincially Threatened and regulated under SARA and the new OESA, are present in the reserve. Several provincially, regionally and/or locally significant species are also present in the Provincial Nature Reserve.

## 2.3.5.2 Evaluated Wetlands

There are no evaluated wetlands located in the AOI.

#### 2.3.5.3

## Areas of Natural and Scientific Interest

ANSIs in the AOI include several provincially and regionally significant Life Science ANSIs. According to the OMNR (1998; 2004a), the Ojibway Prairie Complex provincially significant Life Science ANSI is comprised of the following areas:

- Ojibway Prairie Provincial Nature Reserve;
- Prairie Remnants (Ojibway Park) Life ANSI;
- Prairie Remnants (Titcombe Road North) Life ANSI;
- Prairie Remnants (Spring Garden Road) Life ANSI;
- Prairie Remnants (Black Oak Woods) Life ANSI; and
- Prairie Remnants (Southeast of Nature Reserve) Life ANSI.

These areas are identified on Figure 6.

#### Ojibway Prairie Provincial Nature Reserve

A summary of the features of the Ojibway Prairie Provincial Nature Reserve was presented previously.

#### Ojibway Park

Ojibway Park is a 64 ha site dominated by a Swamp White Oak Mineral Deciduous Swamp (SWD1-1), which has a provincial rank of S2S3 (Very Rare to Uncommon in Ontario – having five to 100 occurrences in the province). Prairie, savannah and woodland communities are also present. At least three different prairie communities have been identified in the park based on differing herbaceous layer species assemblages. Woody species in savannah and woodland communities include pin oak, swamp white oak, black oak (*Q. velutina*), and red maple.

Slender bush-clover (*Lespedeza virginica*), which is listed as Endangered by COSEWIC and COSARO and regulated under the SARA and the new OESA, is present in Ojibway Park. Several provincially, regionally and/or locally significant species are also present in Ojibway Park (OMNR 2002).

#### Titcombe Road North

This 40 ha site consists of tallgrass prairie and oak woodland communities. At least three different prairie communities have been identified in the Titcombe Road North ANSI based on differing herbaceous layer species assemblages. Woody species in woodland communities include black oak, white oak (*Quercus alba*) and red hickory (*Carya ovalis*).

Data collected by LGL Limited to date does not provide details as to the presence/absence of significant species in this portion of the Ojibway Prairie Complex provincially significant Life Science ANSI (OMNR 2002).

#### Spring Garden Road

This 165 ha site consists of tallgrass prairie and oak savannah communities, all of which have a provincial rank of S1 (Extremely Rare in Ontario – having less than five occurrences in the province). Other vegetation communities present in Spring Garden Road ANSI include a large wetland and old field communities. The wetland was originally an artificially constructed lagoon and is presently the largest remaining wetland in the City of Windsor (Woodliffe 1994).

Spring Garden Road ANSI is home to approximately 475 species of plants, 66 species of breeding birds, 14 species of mammals, 10 species of reptiles, four species of amphibians and 66 species of butterflies. Many of the plant species have a prairie affinity (Woodliffe 1994). Purple twayblade, listed as Endangered by COSEWIC and COSSARO and regulated under SARA and the new OESA, is present in Spring Garden Road ANSI. Two species listed as Threatened by COSEWIC and COSSARO and regulated under the new OESA are present including colic-root and spiked blazing star (*Liatris spicata*). American chestnut (*Castanea dentata*), listed as Threatened by COSEWIC and COSSARO and regulated under SARA and the new OESA, and the new OESA, and prairie rose (*Rosa setigera*) and Riddell's goldenrod (*Solidago riddellii*), listed as Special Concern by COSEWIC and COSSARO and regulated under the SARA and the new OESA, are also present in Spring Garden Road ANSI. Several provincially, regionally and/or locally significant species are also present in Spring Garden Road ANSI (Oldham 1994).

#### Black Oak Woods

This 46 ha site is dominated by a Moist-Fresh Black Oak-White Oak Tallgrass Woodland community (TPW2-1). This community type has a global rank of G1 (Extremely Rare – having less than five occurrences in the overall range) and a provincial rank of S1 (Extremely Rare in Ontario – having less than five occurrences in the province). Dominant tree species include black oak and white oak, with some particularly large specimen trees situated at the north end of the woodland.

This ANSI is home to at least 24 prairie indicator species. Purple twayblade, listed as Endangered by COSEWIC and COSSARO and regulated under the SARA and the new OESA, willowleaf aster (*Symphotrichum praealtum*), listed as Threatened by COSEWIC and COSSARO and regulated under SARA, and American chestnut, listed as Threatened by COSEWIC and COSSARO and regulated under SARA, and the new OESA are all present in Black Oak Woods ANSI. Several provincially, regionally and/or locally significant species are also present in Black Oak Woods ANSI (OMNR 2002).

#### Southeast of Nature Reserve

This 40 ha site located to the southeast of Ojibway Prairie Provincial Nature Reserve contains species and communities with a prairie affinity (OMNR 2002). Data collected by LGL Limited to date does not specify the communities located within this portion of the Ojibway Prairie Complex provincially significant Life Science ANSI, nor does it provide details as to the presence/absence of significant species.

## 2.3.5.4 Environmentally Significant Areas

A number of ESAs are located in the AOI and its vicinity. Sixty-three (63) potential ESAs were inventoried in 1981 and/or 1982 and summarized by Oldham (1983). These ESAs were evaluated based on several physical, ecological, and social criteria, including:

- Significant Landforms;
- Linkage System;
- Migratory Stopover;
- Significant Communities;
- Hydrological Significance;
- Diversity;
- Significant Species;
- Size;
- Research/Education; and
- Aesthetic/Historical.

A location was deemed to be an ESA if at least two of the ten criteria were met. At that time, two ESAs were established within the AOI, including:

- Ojibway Black Oak Woods ESA (ESA #19); and
- Spring Garden Road Prairie ESA (ESA #29).

An update of ESAs within Essex County was undertaken in 1991 to evaluate supplementary sites, including previously considered sites and newly identified candidate ESA sites. At that time, a resolution was passed that all PSWs and ANSIs in Essex County be included as ESAs (information on ESAs that are also ANSIs was provided previously). The Ojibway Prairie Complex ESA was designated as ESA #3 through this decision. An ESA update report was prepared by ERCA (1994), which detailed the criteria met by locations not already designated as a PSW or ANSI. In addition to the above-referenced ANSIs, the following ESAs were identified in the AOI and its vicinity:

- St. Clair College Prairie ESA (ESA #49); and
- Sandwich West Woodlot/LaSalle Woods ESA (ESA #18).

A brief description of these ESAs is presented in Table 12 and their locations are shown in Figure 6.

## 2.3.5.5 Carolinian Canada Sites

Carolinian Canada is a coalition of groups, agencies and individuals working to halt the loss of and achieve a substantial increase in the size and quality of natural communities characteristic of Carolinian Canada.

Members include Conservation Authorities, Federation of Ontario Naturalists, Ontario Stewardship, federal and provincial departments and ministries, Canadian Botanical Association, Ontario Federation of Agriculture, and other groups. Dynamic Partnerships are the key to effective program delivery in this complex region. Since 1984 Carolinian Canada has provided a mechanism for cooperation between different levels of government, agencies, conservation authorities and non-government organizations.

ESA Name/ Number	Significant Landforms	Linkage System	Migratory Stopover	Significant Communities	Significant Habitats/ Hydrological Significance	Diversity	Significant Species	Size	Research/ Education	Aesthetic and/or Historical Values
Ojibway Prairie Complex (#3)	Ojibway Prairie Complex (#3) See Section 2.3.5.1 Provincial Nature Reserve									
Sandwich West Woodlot/ LaSalle Woods (#18)		Linkage with Turkey Creek and Ojibway Prairie via a hydro corridor		Species assemblages include species with a prairie affinity	Prairie habitat	Good	Six SARA, Schedule 1 species, one SARA, Schedule 2 species, several provincially and locally significant species	115 ha	Associated with Brunet Park. Potential for scientific research on prairie flora and fauna	
Ojibway Black Oak Woods (#19)		Linkage with Ojibway Prairie		Species assemblages include species with a prairie affinity			One SARA, Schedule 2 species, several provincially and locally significant species			
Spring Garden Road Prairie (#29)		Linkage with Ojibway Prairie		Considered to be one of the best prairie remnants remaining in Essex County	Prairie habitat		Three SARA, Schedule 1 species, one SARA, Schedule 2 species, several provincially and locally significant species			Impressive display of fall- blooming prairie wildflowers
St. Clair College Prairie (#49)					Species assemblages include species with prairie and savannah affinities	Good	Three SARA, Schedule 1 species, several provincially and locally significant species		The St. Clair College of Applied Arts and Technology is adjacent to this ESA	

In 1984, 38 sites were identified as critical natural areas in a study by the identification sub-committee of Carolinian Canada. These sites total 40,800 acres in area. Since 1984, conservation efforts in Carolinian Canada have been directed towards securing these sites through a number of mechanisms that included purchase, municipal designation, landowner contact and private stewardship, and education and public awareness. A land acquisition and stewardship program from 1987-1992 secured over 15,000 acres through voluntary agreements with landowners. This landowner contact program was an innovative, ground-breaking program that spawned many subsequent initiatives. A further ~2,000 acres was purchased for conservation. Today a total of 14,500 acres of the sites is owned by conservation groups. The acquired Carolinian Canada sites are managed by different conservation organizations and by private landowners for conservation purposes. Today, Carolinian Canada promotes innovative and comprehensive approaches to conserving our natural heritage. Through the Big Picture Project, Carolinian Canada has adopted a new conservation vision of an integrated natural heritage network that connects and enhances these islands of green.

One of the 38 Carolinian Canada sites is present within the AOI, the Ojibway Prairie Remnants (Site #31). The Ojibway Prairie Remnants site is now encompassed within the Ojibway Prairie Complex ANSI.

## 2.3.5.6 Candidate Natural Heritage Sites

The City of Windsor and the Town of LaSalle have both undertaken biological inventories of the remnant forest and prairie habitat features to determine their local significance. These Candidate Natural Heritage Sites (CNHSs) are summarized in Town of LaSalle (1996) for the Town of LaSalle and in City of Windsor (1992) for the City of Windsor. The location of CNHSs is presented in Figure 6.

In the Town of LaSalle, CNHSs were evaluated based on several physical and ecological criteria, including:

- Significant Ravine, Valley, River, and Stream Corridors;
- Habitat of Endangered, Threatened, and Vulnerable Species;
- Significant Woodlands;
- Significant Wildlife;
- Significant Wetland;
- Significant Ecological Function;
- Diversity;
- Significant Species;
- Significant Communities;
- Significant Earth Feature; and
- Condition.

Table 13 presents a summary of the LaSalle CNHSs located in the AOI and its vicinity.

In the City of Windsor, CNHSs were evaluated based on several physical and ecological criteria, including:

- Significant Ecological Function;
- Diversity;
- Significant Communities;
- Significant Species;
- Size;
- Representation;
- Condition; and
- Significant Earth Science Features.

Table 14 presents a summary of the Windsor CNHSs located in the AOI and its vicinity.

## 2.3.5.7 Canadian Heritage Rivers System

The Detroit River flows in a north-south direction connecting Lake St. Clair in the north to Lake Erie in the south. Acting as an international border, the river connects American and Canadian communities culturally and economically. More than 14,000,000 vehicles and 8,000 commercial ships cross the Detroit River annually. It also serves many ecological functions as part of the Great Lakes watershed.

The importance of the Detroit River as a natural heritage feature is only one component of its function. Parks Canada designated the Detroit River as a Canadian Heritage River, which recognizes its importance to Canadian history and culture. The Detroit River received American Heritage River designation in 1998 and Canadian Heritage River designation in 2001, making it the first River with dual designations.

The Canadian Heritage River System (CHRS) is a public trust, promoted by local citizens. The program is administered by the Canadian Heritage Rivers Board, whose members are appointed by the Federal, Provincial and Territorial governments. The CHRS was established in 1984 to conserve and protect the best examples of Canada's river heritage, to give them national recognition, and to encourage the public to enjoy and appreciate them. Parks Canada is responsible for submitting recommendations to the Minister of new heritage rivers and providing other forms of support to the CHRS. The CHRS is governed by the *Canadian Heritage Rivers System Charter* and implemented by a *Strategic Plan*.

For a river to become a Canadian Heritage River there are two steps in the process: nomination and designation. The Minister of the Environment and the Provincial/Territorial Minister of the nominating government must grant formal approval of both the nomination and designation. To be considered for nomination, a River must meet the following criteria:

 the nomination must come officially by the participating government, but are generated by private citizens and groups;

Candidate Natural Heritage Site	Significant Ravine, Valley, Stream Corridor	Habitat of Endangered, Threatened, Vulnerable Species	Significant Woodland	Significant Wildlife Habitat	Significant Ecological Function	Overall Diversity	Number of Significant Species Present	Significant Communities	Significant Earth Feature	Condition
TC1		Colicroot, Dense Blazing Star, rairie Rose	3.0 ha	Yes	Groundwater recharge, stormwater retention, hydrological flow	High	22	Tallgrass Prairie, Black Oak-Pignut Hickory Forest, Pin Oak-Swamp White Oak Swamp		Good
TC2	Connects LaSalle Woodlot ESA and St. Clair College Prairie	Prairie Rose, Spiked Blazing Star		Yes		High	8		Sand ridge	Disturbed
CA4		Shumard Oak, Prairie rose	6.1 ha	Yes	Groundwater recharge, stormwater retention, hydrogeological flow linkage area	Low	5	Shumard Oak- Shellbark Hickory Forest		Disturbed

TABLE 13. TOWN OF LASALLE CANDIDATE NATURAL HERITAGE SITES IN THE AOI AND ITS VICINITY

Candidate Natural Heritage Site	Significant Ecological Function	Diversity	Significant Communities	Number of Significant Species Present	Size	Representation	Condition	Significant Earth Features
W23	Stormwater retention				12.0 ha			
W30		Good		28	98.0 ha		Good	
W31		Good	Tallgrass Prairie, Savannah-like Forest	38	15.0 ha		Good	
W32	Stormwater retention	Good	Tallgrass Prairie, Upland Carolinian Forest	59	17.0 ha	Representative communities of the natural landscape of the City of Windsor that are not adequately represented in existing protected areas		
W33	Part of a linkage system that includes Spring Garden Prairie, the Ojibway Prairie Complex, LaSalle Woodlot, Black Oak Heritage Park and C.N.H.S. #37 and #38	Good	Tallgrass Prairie	77	170.0 ha	Contains the only dry- phase prairie remnant in Windsor, is the only remaining habitat in Windsor for the Eastern Massasauga and a number of butterfly species, and contains the best representation of Cattail Marsh in Windsor	Good	
W34	Provides linkage through the Ojibway Prairie Complex, serves as a migratory bird stopover	Good	Black Oak Savannah	18	30.0 ha	Presence of many rare plants and animals also found in the Ojibway Prairie Nature Reserve	Good	
W35		Good		15	10.3 ha		Good	

TABLE 14. CITY OF WINDSON	R CANDIDATE NATURAL	HERITAGE SITES IN T	HE AOI AND ITS	VICINITY

Candidate Natural Heritage Site	Significant Ecological Function	Diversity	Significant Communities	Number of Significant Species Present	Size	Representation	Condition	Significant Earth Features
W36	Linkage through the Ojibway Prairie/Black Oak Complex				1.7 ha		Good	
W37	Linkage between the natural areas of the Ojibway region and the Detroit River			7	24.8 ha		Good	
W38	Linkage between the natural areas of the Ojibway region, Black Oak Heritage Park and C.N.H.S. #37			10	77.0 ha		Good	Sand dune

TABLE 14. CITY OF WINDSOR CANDIDATE NATURAL HER	RITAGE SITES IN THE AOI AND ITS VICINITY

- criteria for consideration include:
  - outstanding natural, cultural and/or recreational values;
  - high level of public support;
  - demonstrated that sufficient measures will be put in place to ensure that those values will be maintained;
- the participating government agrees to pursue nomination;
- the nominated river must meet the criteria set by the CHRS Board; and
- the nomination must be recommended to the responsible Ministers.

It is unclear as to which group nominated the Detroit River for CHRS status. However, the CHRS website provides links to the Detroit River Canadian Cleanup Committee, Detroit River Remedial Action Team and Detroit River Remedial Action Plan, each of which appear to be Canadian based.

A River officially becomes designated once a management plan/heritage strategy is lodged with the CHRS Board by the nominating government. Production of the management plan/heritage strategy is based on public consultation and consensus.

The CHRS has no legislative authority. Nominations are driven by volunteers through partnerships and community involvement. Guidelines are in place to ensure that candidate rivers meet the selection and integrity criteria to become a Canadian Heritage River.

## Municipal Land Use Designations

#### Town of LaSalle

#### Legal Status of Plan

The "*Town of LaSalle Official Plan – LaSalle 2016 – Healthy, Vibrant and Caring*" was adopted on October 14, 1997. The Plan was approved by the Ministry of Municipal Affairs and Housing (MMAH) on May 18, 1998. The document used for this report is the November 4, 2003 Office Consolidation, which incorporates Official Plan Amendment No. 1, provincially approved on November 4, 2003.

#### Environmental Designations

Section 2 identifies general development policies for various uses, including: woodlots; developments along inland watercourses; re-use of potentially contaminated sites; and, special policy area – species at risk.

Section 3 provides the land use designations for natural heritage sites, including permitted uses and other restrictions in the Town.

Two areas within the AOI are designated as Natural Environment: the Southeast of Nature Reserve ANSI and the Spring Garden Forest ANSI. The LaSalle Woods, located in the vicinity of the AOI, is also designated as Natural Environment.

2.3.5.8

Areas designated as Natural Environment include: woodlots; wetlands; and prairie communities. These areas are recognized as playing an important role in keeping people physically, mentally and spiritually healthy. Permitted uses in these areas include: passive recreation; wildlife management; conservation uses; and, buildings/structures associated with these uses. The official plan states that utility corridors and inland watercourses should be used as linkages between natural heritage sites, and should be enhanced and maintained as wildlife habitat areas, recreational trails, bikeways and walkways. Preservation and management of areas designated Natural Heritage shall be via public purchase, private stewardship, conservation easements and management agreements.

#### Level of Protection

The Town of LaSalle, through its Official Plan has set a goal of creating a Greenway System, which will comprise trails, parks and woodlots for the benefit and enjoyment of wildlife and residents alike. As a municipal planning policy, this provides a reasonable level of protection for natural features within the proposed Greenway System.

Environmental land use designations within the Town of LaSalle are regulated by the Official Plan, which is approved under the *Planning Act*. The Official Plan, the Provincial Policy Statement and the *Planning Act* afford protection for provincially, regionally and locally significant designated natural areas.

#### City of Windsor

#### Legal Status of Plan

The City of Windsor Official Plan (2004) was adopted on October 25, 1999 by By-law 350-1999. The Plan was approved by the Ontario Ministry of Municipal Affairs and Housing (MMAH), in part, on March 28, 2000. The remainder of the Plan was approved by an Ontario Municipal Board decision on November 1, 2002. This is an office consolidation of the Plan which incorporates the approved Plan plus subsequent Amendments.

#### **Environmental Designations**

Section 5, Volume 1 of the Official Plan identifies designations as being part of the '*Greenway System*' on Schedule B of the City's Official Plan.

Section 6.8, Volume 1 of the Official Plan identifies permitted uses for each of the land use designations in the City. The Natural Heritage designation governs natural heritage areas located in the City.

Permitted uses within the Natural Heritage designation include nature reserves and wildland management. Ancillary uses may include recreation and leisure activities and facilities, provided the use is secondary and complementary to the main permitted use. If development is proposed, an Environmental Evaluation Report (EER) is required to demonstrate that features and functions will not be adversely impacted. EERs are also required for any development on lands adjacent to those designated Natural Heritage.

Several overlays are subcategories to the land use designations and are identified as 'Development Constraint Area' on Schedule C of the City's Official Plan. These

Constraint Areas, including Natural Heritage, Environmental Policy Areas and Candidate Natural Heritage Sites, afford various levels of protection to the City's natural environmental features.

Natural Heritage Policies identify areas under provincial protection (ie. Provincially Significant Wetlands and ANSIs). Environmental Policy Areas identify areas of significance that may permit development, subject to criteria, including: biological diversity; significant natural community; vulnerable, threatened or endangered species; low levels of disturbance; significant earth science features; and, visual, aesthetic or recreational importance to the City. Candidate Natural Heritage Sites contain potentially significant and/or sensitive environmental features or functions, which are subject to an Environmental Evaluation Report to determine if development is appropriate.

Several natural heritage land use designations are identified in the Schedules to the Official Plan. Three areas located in the AOI are designated as Natural Heritage: Ojibway Prairie Complex, Oakwood Bush and the eastern section of Malden Park. Two areas of the Titcombe Road North ANSI, a section of the Spring Garden Forest ANSI and the St. Clair College Prairie ESA are designated as Special Policy Area "A".

#### Secondary Planning Areas

The Official Plan – Volume 2 contains several Secondary Plans, some of which have natural feature components. The Spring Garden Planning Area is located in the AOI.

#### Spring Garden Planning Area

- Features in this area are recognized as significant, including Spring Garden Natural Area Complex (Schedule SG-1) and shall be conserved. Development must adhere to the Spring Garden Complex Management Plan.
- All lands within the Spring Garden Natural Area Complex shall be acquired in stages, by means of exchanges, parkland conveyance provisions (*Planning Act*), purchase by City based on independent appraisal, or purchase by appropriate government agencies.

#### Level of Protection

Lands included as part of the Greenway System may be protected via: conveyance/dedication as part of the planning system; land purchase; partnership arrangements with the ERCA or other group; conservation as a condition of planning approval; leases with private property owners to protect parts/all of the identified area; land exchange; donations/gifts/bequeaths from individuals/corporations; conservation easements; stewardship agreements; and other measures.

Environmental land use designations in the City of Windsor are governed by the Official Plan, the Provincial Policy Statement and the *Planning Act*. These laws, policies and plans afford protection to provincially, regionally and locally significant natural heritage areas.

## 2.4 Evaluate Alternatives

## 2.4.1 Practical Alternatives

There are six proposed access roads, four proposed plazas and three proposed crossings. The location of crossings, plazas and access roads are presented in Figure 7.

## 2.4.1.1 Access Roads

Each of the six access road alternatives (1A, 1B, 2A, 2B, 3 and Parkway) has differing road alignments in certain segments of the access road, which results in slightly different impacts. The six alternatives for the proposed access road differ based on the built-form of highway and/or access roads. The access road alternatives include:

- Alternative 1A is an at-grade six-lane freeway with one-way service roads on either side.
- Alternative 1B is a below grade six-lane freeway with one-way service roads on either side.
- Alternative 2A is an at-grade six-lane freeway with two-way services roads located south of the freeway.
- Alternative 2B is a below grade six-lane freeway with two-way service roads located south of the freeway.
- Alternative 3 is a cut and cover tunnelled six-lane freeway underneath Huron Church/Highway 3 corridor. Huron Church/Highway 3 would remain and be used as service roads.
- The Parkway is a refinement of below grade Alternatives 1B and 2B and includes 11 short tunnels totaling 1.86 km, one- and two-way service roads, recreational trails and parkland. The Parkway has a wider right-of-way that provides a buffer from adjacent land uses and opportunities for ecological restoration, enhancement and linkage.

2.4.1.2

## Plazas and Crossings

There are three different proposed locations for a new border crossing in the west Windsor area and four plaza alternatives. Seven plaza/crossing combinations have been proposed:

- Crossing A-Plaza A is a bridge crossing south of the Brighton Beach Power Generation Station and plaza located south of E.C. Row Expressway, east of Ojibway Parkway. The approach road between the plaza and crossing generally runs along side Broadway Street.
- Crossing B-Plaza A is a bridge crossing north of the Brighton Beach Power Generation Station and plaza located south of E.C. Row Expressway, east of Ojibway Parkway. The approach road runs alongside Sandwich and Broadway Streets.



- Crossing C-Plaza A is a bridge crossing in the industrial portlands near Russell Street/Sandwich Street and plaza located south of E.C. Row Expressway, east of Ojibway Parkway. There are two possible connecting road options, one runs alongside Sandwich Street and Broadway Avenue through Brighton Beach, while the other is along Sandwich Street and the western extension of Ojibway Parkway.
- Crossing B-Plaza B1 is a bridge crossing north of the Brighton Beach Power Generation Station directly connected to a plaza located at the southern end of Sandwich Street, connecting to the new crossing via of Broadway Street.
- Crossing C-Plaza B is a bridge crossing in the industrial portlands near Russell Street/Sandwich Street and plaza located at the southern end of Sandwich Street, north of Broadway Street. The approach road runs generally alongside Sandwich Street.
- Crossing C-Plaza C is a bridge crossing in the industrial portlands near Russell Street and Sandwich Street and plaza located west of Sandwich Street, south of Prospect Avenue. The approach road runs alongside Sandwich Street.

## 2.4.2 Evaluation Criteria

Comparative criteria were developed to evaluate the practical alternatives based on the approach described in the *Draft Natural Heritage Work Plan* (Border Transportation Partnership 2005). The natural heritage evaluation criteria addressed three levels of biological organization: landscapes; ecosystems/communities; and, populations/species and two areas of project influence: right-of-way; and, adjacent lands. The right-of-way study area included all lands located within the footprint of each practical alternative, including crossings, plazas and access roads. The adjacent lands study area included all lands located within the footprint of each practical alternative, including crossings, plazas and access roads. The 120 metre distance for adjacent lands was based on historical precedent, accepted environmental practice and a recognition that most disturbance effects to natural heritage features occur within 120 metres of the proposed facility. The performance measure, criteria, indicators, and data sources used to evaluate practical alternatives are presented in Table 15.

2.4.2.1

## Impacts to Ecological Landscapes Located in the ROW

A landscape is a heterogeneous land area composed of a cluster of interacting ecosystems that is repeated in similar form throughout. Landscapes vary in size, down to a few kilometers in diameter. Three types of landscapes are recognized: patch; corridor; and, matrix. A patch is a non-linear surface area differing in appearance from its surroundings. Patches can be isodiametric, elongated, ring or peninsula shaped. A corridor is a narrow strip of land that differs from the matrix on either side. Corridors can be line, strip or stream. A matrix is the most extensive and most connected landscape element type present, which plays the dominant role in landscape functioning (Forman and Godron 1986).

#### Significance

The significance of the landscape unit was assessed based on professional judgement and application of the principles of landscape ecology (Forman and Godron 1986). The significance of ecological landscapes was categorized as follows:

Performance Measure	Criteria	Indicator	Data Source
Ecological Landscapes	Impacts to Ecological Landscapes Located in the ROW	<ul> <li>Landscape name and type (patch, corridor, matrix)</li> <li>Landscape significance (high, moderate, low)</li> </ul>	<ul> <li>Aerial photographs</li> <li>Field investigations</li> <li>Plan and Profile</li> </ul>
Communities/ Ecosystems	Impacts to Terrestrial Communities/ Ecosystems Located in the ROW	<ul> <li>Community name and type (ELC)</li> <li>Area displaced by crossing, plaza and access road footprint (ha)</li> <li>Community significance (high, moderate, low)</li> </ul>	<ul><li>Aerial photographs</li><li>Field investigations</li><li>Plan and Profile</li></ul>
	Impacts to Aquatic Communities/ Ecosystems Located in the ROW	<ul> <li>Community name</li> <li>Area displaced by crossing, plaza and access road footprint (ha)</li> <li>Community significance (high, moderate, low, negligible)</li> </ul>	<ul><li>Aerial photographs</li><li>Field investigations</li><li>Plan and Profile</li></ul>
Populations/ Species	Impacts to Species at Risk Located in the ROW	<ul> <li>Species name</li> <li>Number of species at risk (provincial rank S1 to S3)</li> </ul>	<ul><li>Field investigations</li><li>Plan and Profile</li></ul>
Designated Natural Areas	Impacts to Designated Natural Areas Located on Adjacent Lands	<ul> <li>Area name and type (ANSI, ESA, CNHS)</li> <li>Area disturbed within 120 m of crossing, plaza and access road footprint (ha)</li> </ul>	<ul> <li>Aerial photographs</li> <li>Plan and Profile</li> <li>ANSI, ESA, CNHS reports and maps</li> </ul>

#### TABLE 15. NATURAL HERITAGE CRITERIA USED TO EVALUATE PRACTICAL ALTERNATIVES

- Natural heritage features that display a high level of prominence in the landscape based on size, shape, number, type and/or configuration (i.e. pattern and connectivity) were considered of "high" significance. The Detroit River was identified as a landscape unit with a high level of prominence in the landscape. The Ojibway Prairie Complex is also considered to have a high level of prominence in the landscape, but this landscape unit will not be fragmented or severed by any of the practical alternatives.
- Natural heritage features that display a moderate level of prominence in the landscape based on size, shape, number, type and/or configuration were considered of "moderate" significance. Major stream corridors, such as Turkey Creek, were

identified as landscape units with a moderate level of prominence in the landscape. Matrices, and strip corridors with high connectivity to adjacent natural heritage features, were also identified as landscape units with a moderate level of prominence in the landscape.

 Natural heritage features that display a low level of prominence in the landscape based on size, shape, number, type and/or configuration were considered of "low" significance. Minor stream corridors, patches and strip and line corridors with low connectivity to adjacent natural heritage features were identified as landscape units with a low level of prominence in the landscape.

## 2.4.2.2 Impacts to Terrestrial Communities/Ecosystems Located in the ROW

Terrestrial communities/ecosystems include any land-based environment, from small to large, in which plants and animals interact with the chemical and physical features of the environment. In Ontario, the Ecological Land Classification for Southern Ontario is used to classify terrestrial communities/ecosystems based primarily on vegetation structure and composition and soil characteristics.

#### Significance

The significance of terrestrial communities/ecosystems was catergorized as follows:

- All vegetation communities ranked S1 to S3 by the Natural Heritage Information Centre (NHIC) were considered of "high" significance. The NHIC has ranked many vegetation communities located in Ontario based on rarity. Vegetation communities ranked S1, S2 and S3 are considered provincially rare by the NHIC and were attributed a "high" level of significance by the study team.
- Natural vegetation communities ranked S4 to S5 or not ranked by the NHIC were considered of "moderate" significance. Natural vegetation communities that were found to be in a state more typical of pre-human settlement were assigned a "moderate" level of significance.
- Cultural vegetation communities ranked S4 to S5 or not ranked by the NHIC were considered of "low" significance. Cultural vegetation communities occur as a result of human influence and were assigned a "low" level of significance.

While it was recognized that these definitions tend to generalize the significance of vegetation communities, this approach was considered reasonable for the purposes of evaluating practical alternatives.

## 2.4.2.3

## Ampacts to Aquatic Communities/Ecosystems Located in the ROW

Aquatic ecosystems/communities include any watery environment, from small to large, in which plants and animals interact with the chemical and physical features of the environment. Types of aquatic communities/ecosystems are typically classified as lentic (i.e. waterbodies such as ponds, lakes and oceans) and lotic (i.e. watercourses such as ditches, agricultural drains, streams and rivers).

#### Significance

The significance of aquatic communities/ecosystems was categorized was follows:

- Aquatic communities that directly support critical fish habitat were considered of "high" significance. Critical fish habitats require a high level of protection because of their importance in sustaining subsistence, commercial or recreational fisheries, their rareness, their high productive capacity, the sensitivity of certain life stages of the fish species they support, etc. No watercourses located in the AOI directly support critical fish habitat.
- Aquatic communities that directly support important fish habitat were considered of "moderate" significance. Important fish habitats require a moderate level of protection and may include areas utilized by fish for feeding, growth and migration which, while important to the fish stock, are not considered critical. Areas in this category usually contain a relatively large amount of similar habitat that is readily available to the stock. Habitat that has been disrupted by past human activity may also fall into this category.
- Aquatic communities that directly support marginal fish habitat were considered of "low" significance. Marginal fish habitats require a minimal level of protection and have a low productive capacity. These habitats contribute marginally to fish production, but do have reasonable potential for enhancement or restoration.
- Aquatic communities that do not directly support fish habitat were considered of "negligible" significance. Areas that do not directly support fish habitat may contribute to the maintenance of fish habitat elsewhere in the system through baseflow, temperature moderation or chemical and organic inputs.

## 2.4.2.4

## Impacts to Species at Risk Located in the ROW

Species at risk is used here as a general term that indicates that a species is of conservation concern due to reduced populations, limited distribution or habitat loss. For evaluation purposes, species at risk included all vascular plants and terrestrial vertebrate species ranked S1 to S3 by the NHIC. Species ranked S1 to S3 include provincially rare species and species regulated by the *Species at Risk Act* and the new *Ontario Endangered Species Act*.

2.4.2.5

## Impacts to Designated Natural Heritage Features Located on Adjacent Lands

Designated natural heritage features included Areas of Natural or Scientific Interest (ANSIs), Environmentally Sensitive Areas (ESAs) and Candidate Natural Heritage Sites (CNHSs). There are no Provincially Significant Wetlands (PSWs) located in the AOI. No differentiation among these types of designated natural heritage areas was made based on significance for the purposes of evaluation. Natural heritage areas with multiple designations (i.e. the same area is designated as an ANSI/ESA/CNHS) were counted only once to represent the actual area disturbed and to avoid double-counting.

## 2.4.3 Evaluation Method

Natural heritage information, including ELC polygons, wildlife habitat polygons, stream reaches, designated natural heritage areas, etc. were delineated on aerial photographs, digitized and entered into the GIS. Attribute information, including ELC code, species at risk, habitat type, etc. were entered into the GIS database and linked to the geographical information. The footprint occupied by each practical alternative and adjacent lands located within 120 metres of the footprint were also digitized and entered into the GIS. The GIS was then used to superimpose the facility footprint and adjacent lands over the natural heritage information. A GIS algorithm was used to output the name, type, area and significance of each ELC polygon area overlapped by the footprint of each practical alternative. For adjacent lands, the GIS algorithm output the type and area of each designated natural area polygon overlapped within 120 metres of the footprint of each practical alternative. Data was output by segment to an Excel spreadsheet for analysis. The raw information output by the GIS algorithm is maintained on file by LGL Limited. This raw information was then analyzed based on significance (high, moderate, low and negligible) for each criterion, where relevant, and totalled. The analysis of significance by segment is presented in Appendix J. The data for each segment was then added together to derive a total to be used to evaluate crossings, plazas and access roads from end to end. The data used to evaluate crossings, plazas and access roads from end to end are presented in Table 16. The crossings, plazas and access roads superimposed on the ELC vegetation communities and watercourses are presented in Appendix K.

The evaluation of alternatives was based on the number, area, type and significance of natural heritage features to be displaced or disturbed by the transportation facility. Generally, the practical alternatives with the greatest impact (number or area) to the most important natural heritage features (type and significance) were considered less preferred than the practical alternatives that resulted in the least impact to the least important natural heritage features.

An arithmetic evaluation method was used to compare practical alternatives using criteria and indicators. Criteria are the standards used to compare alternatives (i.e. impacts to ecological landscapes located in the ROW); indicators are the measurement units used to compare alternatives (i.e. number, area, significance, etc.). The indicators and criteria were assigned weights to reflect the level of importance of each indicator and criterion in decision-making. At the indicators level of analysis, each indicator for a criterion was weighted such that the total weight for all indicators for a criterion totaled one. At the criteria level of analysis, each criterion was weighted such that the total scores were then added to derive a total weight for all criteria totaled one. Weighted scores were then added to derive a total weighted score for each crossing and plaza and each access road. This evaluation method is often referred to as simple additive weighting.

Anril	2000
AUTI	2000

Performance Measure Ecological Landscapes							Communities / Ecosystems									Designated Natural Areas
Criteria / Indicator			Impa	acts to Ecolog Landscapes	jical	Impacts to Terrestrial Communities / Ecosystems				Impacts	s to Aquatic C	Commur	cosystems	Impacts to Species at Risk	Impacts to Designated Natural Areas	
Меа	asureme	ent / Units	Lands	scape Numbe Significance	r and	Со	mmunity Area	a and Sig	nificance	C	Community A	rea and	Number of Species	Area (ha)		
aza	rom ssing	Segment	Number of Landscapes			Area Displaced (ha)			Total Area (ha)	Ŧ	Area Displace	ed (ha)	Total Area (ha)	Provincially Rare	Total Area (ha)	
Р	Fr Cro		High	Moderate	Low	High	Moderate	Low	Displaced	High	Moderate	Low	Neg.	Displaced	Colonies	Disturbed
	А	A-G	1	2	2	2.98	1.83	27.77	32.58	0.00	0.10	0.01	0.11	0.22	232	7.38
٨	В	B-G	1	2	2	2.70	1.82	26.24	30.77	0.00	0.10	0.03	0.18	0.31	223	2.38
A	С	C-E-G	1	2	3	2.69	2.74	25.44	30.87	0.00	0.13	0.03	0.15	0.31	231	1.48
	С	C-G	1	2	1	2.70	2.73	22.86	28.29	0.00 🌽	0.13	0.01	0.11	0.25	186	1.73
В	С	C-G	1	3	6	2.02	2.09	36.56	40.68	0.00	0.21	0.13	0.30	0.64	195	14.82
B1	В	B-G	1	2	5	1.09	1.19	42.79	45.07	0.00	0.17	0.07	0.35	0.59	185	10.96
С	С	C-G	1	2	7	0.89	2.11	33.23	36.23	0.00	0.19	0.19	0.18	0.56	153	7.77

## TABLE 16. DATA USED TO EVALUATE CROSSINGS, PLAZAS AND ACCESS ROADS END TO END

Performance Measure	Ecolo	gical Landsca	apes	Communities / Ecosystems							Populations / Species	Designated Natural Areas		
Criteria / Indicator	Impao I	cts to Ecolog andscapes	Impa	icts to Terres Ecos	strial Con ystems	Impact	ts to Aquatic	Commu	Impacts to Species at Risk	Impacts to Designated Natural Areas				
Measurement / Units	nent / Units Landscape Number and Significance					a and Sig		Community A	rea and	Number of Species	Area (ha)			
Routes	Numb	er of Landsca	Area Displaced (ha) Total Are (ha)				Area Displaced (ha) Total Area (h					Provincially Rare	Total Area (ha)	
	High	Moderate	Low	High	Moderate	Low	Displaced	High	Moderate	Low	Neg.	Displaced	Colonies	Distuibed
Alt1A-Plaza A	0	3	19	1.43	7.25	16.35	25.03	0.00	0.39	0.85	0.06	1.29	142	54.49
Alt1A-Plaza B or C	0	3	19	0.44	3.14	13.51	17.10	0.00	0.39	0.74	0.03	1.16	102	44.34
Alt1AOpt2-Plaza A	0	3	19	1.53	7.79	17.32	26.63	0.00	0.31	0.45	0.09	0.85	134	54.82
Alt1AOpt2-Plaza B or C	0	3	19	0.50	3.68	14.41	18.58	0.00	0.31	0.17	0.03	0.51	92	44.67
Alt1B-Plaza A	0	3	19	1.46	7.29	17.03	25.78	0.00	0.40	0.83	0.08	1.32	152	54.18
Alt1B-Plaza B or C	0	3	19	0.43	3.18	13.69	17.30	0.00	0.40	0.74	0.03	1.17	112	44.10
Alt1BOpt2-Plaza A	0	3	19	1.46	7.29	17.04	25.79	0.00	0.40	0.84	0.07	1.32	152	54.51
Alt1BOpt2-Plaza B or C	0	3	19	0.54	3.82	14.92	19.28	0.00	0.28	0.18	0.03	0.49	103	44.62
Alt2A-Plaza A	0	3	19	2.22	7.65	18.35	28.22	0.00	0.38	0.87	0.05	1.30	162	55.54
Alt2A-Plaza B or C	0	3	19	1.19	3.64	14.92	19.75	0.00	0.38	0.71	0.02	1.11	122	46.07
Alt2AOpt2-Plaza A	0	3	19	2.22	7.80	18.66	28.68	0.00	0.08	0.26	0.05	0.40	155	55.26
Alt2AOpt2-Plaza B or C	0	3	19	1.18	3.79	15.46	20.43	0.00	0.08	0.16	0.02	0.26	116	45.79
Alt2B-Plaza A	0	3	19	1.86	7.60	17.61	27.07	0.00	0.38	0.87	0.05	1.31	145	53.88
Alt2B-Plaza B or C	0	3	19	0.82	3.60	14.28	18.70	0.00	0.38	0.77	0.02	1.17	105	44.41
Alt2BOpt2-Plaza A	0	3	19	1.86	7.75	18.23	27.84	0.00	0.38	0.87	0.05	1.31	145	53.61
Alt2BOpt2-Plaza B or C	0	3	19	0.82	3.75	14.90	19.47	0.00	0.38	0.77	0.02	1.17	105	44.14
Alt3-Plaza A	0	3	19	1.48	7.41	14.36	23.25	0.00	0.37	0.39	0.06	0.82	131	53.50
Alt3-Plaza B or C	0	3	19	0.50	3.40	11.46	15.36	0.00	0.37	0.28	0.02	0.67	92	43.38
Parkway-Plaza A	0	3	19	2.54	1.05	39.00	42.59	0.00	0.47	1.47	0.20	2.14	180	48.87
Parkway-Plaza B or C	0	3	19	1.47	1.26	34.48	37.21	0.00	0.47	1.39	0.17	2.03	141	45.04

## TABLE 16. DATA USED TO EVALUATE CROSSINGS, PLAZAS AND ACCESS ROADS END TO END

The rationale for assigning weights at the indicators level of analysis was to assign a greater weight to indicators with a greater level of significance (i.e. "high," "moderate," "low" and "negligible"). For "impacts to ecological landscapes located in the ROW," "high" was not assigned a weight because all crossing and plaza alternatives affected one "high" significance landscape (Detroit River) and no access road alternatives affected "high" significance landscapes. Because "high" was not considered decision relevant, a weight of 0.65 was assigned to "moderate" and 0.35 was assigned to "low." For "impacts to terrestrial communities/ecosystems located in the ROW," the greatest weight was assigned to "high" (0.6), followed by "moderate" (0.3) and then "low" (0.1). For "impacts to aquatic communities/ecosystems located in the ROW," weights were assigned to "moderate" (0.6), followed by "low" (0.3) and then "negligible" (0.1). Because there were no watercourses or waterbodies with "high" significance and "high" was not considered decision relevant, greater importance was placed on "moderate," "low" and "negligible." "Impacts to species at risk located in the ROW" and "impacts to designated natural areas located on adjacent lands" were not assigned a weight because these two criteria each had only one indicator.

The rationale for assigning weights at the criteria level of analysis was based on professional judgement taking into consideration the importance of the natural heritage features and the potential effects of the new highway facility. "Impacts to terrestrial communities/ecosystems located in the ROW" measures the area and significance of vegetation communities that will be displaced by a new transportation facility. Because a number of these vegetation communities are provincially and globally rare, the community/ecosystem level of biological organization is considered the most important, and replacement of provincially and globally rare vegetation communities requires dedicated management efforts, this criterion was assigned a weight of 0.4.

"Impacts to aquatic communities/ecosystems located in the ROW" measures the area and significance of aquatic communities that will be altered by a new transportation facility. Since many of the aquatic communities have been degraded and restoration is more easily achieved than is the case with complex/rare terrestrial ecosystems, this criterion was assigned a weight of 0.2.

"Impacts to species at risk located in the ROW" measures the number of rare specimens/colonies that will be displaced by a new transportation facility. The loss of provincially rare plant and animal species was considered important; however, many of these provincially rare specimens/colonies are located in provincially rare communities that already received a weight of 0.4 under the "impacts to terrestrial communities/ecosystems located in the ROW" criterion. For this reason, "impacts to species at risk located in the ROW" was assigned a weight of 0.2 to add further emphasis to the importance of "impacts to terrestrial communities/ecosystems located in the ROW," but not too much weight to result in a double or triple counting of impacts.

"Impacts to ecological landscapes located in the ROW" measures the number and significance of landscape units that will be lost or fragmented by the transportation facility. Since this criterion is similar to "impacts to terrestrial/aquatic communities/ecosystems located in the ROW," which was already assigned a combined weight of 0.6, this criterion was assigned a weight of 0.1.

"Impacts to designated natural areas located on adjacent lands" measures the area of important natural heritage features located nearby that may be disturbed by a new transportation facility. The effects of disturbance are considered less severe and more easily

mitigated than the effects of displacement; therefore, this criterion was considered less important. However, because the features located on adjacent lands are designated for protection, their importance is increased. As a result, a weight of 0.1 was assigned to this criterion.

The values were then multiplied by the weights to derive a weighted indicator score and a weighted criterion score for each practical alternative. The results of the weighting of indicators are presented in Table 17 and the results of the weighting of criteria are presented in Table 18. A lower weighted score reflects less environmental impact and is thus preferred to a higher weighted score.

## 2.4.3 Results

The total weighted scores were used to establish a level of preference for practical alternatives. The total weighted scores for practical alternatives are presented in Table 19. The results of the arithmetic evaluation were then reviewed in light of the information to gain an appreciation for the advantages and disadvantages of each practical alternative and to confirm that the arithmetic evaluation was sound. The results of the qualitative and quantifative evaluations are presented below. The importance assigned to provincially rare vegetation communities and species at risk through weighting in the arithmetic evaluation has a significant influence on the results. This approach is considered reasonable given the ecological and social importance of these features within the province.

## 2.4.3.1 Access Roads

The access roads are illustrated in Figure 7 and Appendix K.

## **Review of Information**

Access Road 1A from Plaza A will result in the loss of 25.03 ha of terrestrial communities and 1.29 ha of aquatic communities. This includes 1.43 ha of provincially rare vegetation communities and 142 specimens/colonies of species at risk. A total of 54.49 ha of designated natural areas is located on adjacent lands. Access Road 1A from Plazas B or C will result in the loss of 17.10 ha of terrestrial communities and 1.16 ha of aquatic communities. This includes 0.44 ha of provincially rare vegetation communities and 102 specimens/colonies of species at risk. A total of 44.34 ha of designated natural areas is located on adjacent lands. Option 2 from Plaza A will result in the loss of 26.63 ha of terrestrial communities and 0.85 ha of aquatic communities. This includes 1.53 ha of provincially rare vegetation communities and 134 specimens/colonies of species at risk. A total of 54.82 ha of designated natural areas is located on adjacent lands. Option 2 from Plazas B or C will result in the loss of 18.58 ha of aquatic communities and 0.51 ha of aquatic communities. This includes 0.50 ha of provincially rare vegetation communities. A total of 44.67 ha of designated natural areas is located on adjacent lands.

Pe	rforman	ce Measure	Ec	ological Lan	es	Communities / Ecosystems									Populations / Species	Designated Natural Areas			
(	Criteria I	Indicator	Im	npacts to Ec Landscap	ologic: ces	al	lı Corr	Impacts to Terrestrial Communities / Ecosystems				acts to Aqua Ecos	itic Cor ystems	ties /	Impacts to Species at Risk	Impacts to Designated Natural Areas			
M	easurem	surement / Units Landscape Number and Community Area and Significance Significance Community Area and Signif						ignific	ance	Number of Species	Area (ha)								
Iza	om sing	Sormont	Sogmont	Segment	Segment	Number of Landscapes		lhted ore	Area Displaced		(ha)	lhted ore	Area Displac		ed (ha)		lhted ore	Provincially Rare	Total Area
Pla	Fre Cros	Segment	High	Moderate	Low	Weig Scr	High	Moderate	Low	Weig Scr	High	Moderate	Low	Neg.	Weig Sco	Specimens/C olonies	(ha) Disturbed		
	Α	A-G	1	2	2	1.40	2.98	1.83	27.77	5.11	0.00	0.10	0.01	0.11	0.07	232	7.38		
Δ	В	B-G	1	2	2	1.40	2.70	1.82	26.24	4.79	0.00	0.10	0.03	0.18	0.09	223	2.38		
	C	C-E-G	1	2	3	1.50	2.69	2.74	25.44	4.98	0.00	0.13	0.03	0.15	0.10	231	1.48		
	Ŭ	C-G	1	2	1	1.30	2.70	2.73	22.86	4.73	0.00	0.13	0.01	0.11	0.09	186	1.73		
В	С	C-G	1	3	6	2.10	2.02	2.09	36.56	5.50	0.00	0.21	0.13	0.30	0.20	195	14.82		
B1	В	B-G	1	2	5	1.70	1.09	1.19	42.79	5.29	0.00	0.17	0.07	0.35	0.16	185	10.96		
	C	C-G	1	2	7	1.90	0.89	2.11	33.23	4.49	0.00	0.19	0.19	0.18	0.19	153	7.77		
	Indicato	r Weight	0.60	0.30	0.10	1.00	0.60	0.30	0.10	1.00	0.00	0.60	0.30	0.10	1.00	1.00	1.00		

## TABLE 17. WEIGHTED INDICATORS FOR CROSSINGS, PLAZAS AND ACCESS ROADS END TO END

Measurement / Units	La	ndscape Nu Significa	mber aı nce	nd	Comm	unity Area a	nd Signi	ificance	Community Area and Significance					Number of Species	Area (ha)
Route	Numbe	er of Landsc	apes	eighted Score	Area Displaced (ha)			eighted Score		Area Displa	ced (ha	)	eighted Score	Provincially Rare Specimens /	Total Area (ha)
	High	Moderate	Low	M	High	Moderate	Low	M	High	Moderate	Low	Neg.	N N	Colonies	Disturbed
Alt1A-Plaza A	0	3	19	8.60	1.43	7.25	16.35	4.67	0.00	0.39	0.85	0.06	0.49	142	54.49
Alt1A-Plaza B or C	0	3	19	8.60	0.44	3.14	13.51	2.56	0.00	0.39	0.74	0.03	0.46	102	44.34
Alt1AOpt2-Plaza A	0	3	19	8.60	1.53	7.79	17.32	4.98	0.00	0.31	0.45	0.09	0.33	134	54.82
Alt1AOpt2-Plaza B or C	0	3	19	8.60	0.50	3.68	14.41	2.84	0.00	0.31	0.17	0.03	0.24	92	44.67
Alt1B-Plaza A	0	3	19	8.60	1.46	7.29	17.03	4.77	0.00	0.40	0.83	0.08	0.50	152	54.18
Alt1B-Plaza B or C	0	3	19	8.60	0.43	3.18	13.69	2.58	0.00	0.40	0.74	0.03	0.47	112	44.10
Alt1BOpt2-Plaza A	0	3	19	8.60	1.46	7.29	17.04	4.77	0.00	0.40	0.84	0.07	0.50	152	54.51
Alt1BOpt2-Plaza B or C	0	3	19	8.60	0.54	3.82	14.92	2.96	0.00	0.28	0.18	0.03	0.23	103	44.62
Alt2A-Plaza A	0	3	19	8.60	2.22	7.65	18.35	5.46	0.00	0.38	0.87	0.05	0.49	162	55.54
Alt2A-Plaza B or C	0	3	19	8.60	1.19	3.64	14.92	3.30	0.00	0.38	0.71	0.02	0.44	122	46.07
Alt2AOpt2-Plaza A	0	3	19	8.60	2.22	7.80	18.66	5.54	0.00	0.08	0.26	0.05	0.13	155	55.26
Alt2AOpt2-Plaza B or C	0	3	19	8.60	1.18	3.79	15.46	3.39	0.00	0.08	0.16	0.02	0.10	116	45.79
Alt2B-Plaza A	0	3	19	8.60	1.86	7.60	17.61	5.16	0.00	0.38	0.87	0.05	0.50	145	53.88
Alt2B-Plaza B or C	0	3	19	8.60	0.82	3.60	14.28	3.00	0.00	0.38	0.77	0.02	0.46	105	44.41
Alt2BOpt2-Plaza A	0	3	19	8.60	1.86	7.75	18.23	5.26	0.00	0.38	0.87	0.05	0.50	145	53.61
Alt2BOpt2-Plaza B or C	0	3	19	8.60	0.82	3.75	14.90	3.11	0.00	0.38	0.77	0.02	0.46	105	44.14
Alt3-Plaza A	0	3	19	8.60	1.48	7.41	14.36	4.55	0.00	0.37	0.39	0.06	0.35	131	53.50
Alt3-Plaza B or C	0	3	19	8.60	0.50	3.40	11.46	2.47	0.00	0.37	0.28	0.02	0.31	92	43.38
Parkway-Plaza A	0	3	19	8.60	2.54	1.05	39.00	5.74	0.00	0.47	1.47	0.20	0.74	180	48.87
Parkway- Plaza B or C	0	3	19	8.60	1.47	1.26	34.48	4.71	0.00	0.47	1.39	0.17	0.72	141	45.04
Indicator Weight	0.00	0.65	0.35	1.00	0.60	0.30	0.10	1.00	0.00	0.60	0.30	0.10	1.00	1.00	1.00
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## TABLE 17. WEIGHTED INDICATORS FOR CROSSINGS, PLAZAS AND ACCESS ROADS END TO END

A

Performance Measure			Ecolo Lands	ogical capes	с	ommunities	/ Ecosystems	8	Populations	/ Species	Designate Are		
Criteria / Indicator			Impacts to Lands	Ecological capes	Impacts to Commu Ecosys	Terrestrial nities / stems	Impacts to Commu Ecosys	Aquatic nities / stems	Impacts to S Risi	pecies at k	Impacts to I Natural	Total Weighted Score	
Plaza	From Crossing	Segment	Weighted Indicator Score	Weighted Criterion Score	Weighted Indicator Score	Weighted Criterion Score	Weighted Indicator Score	Weighted Criterion Score	Provincially Rare Specimens /Colonies	Weighted Criterion Score	Total Area (ha) Disturbed	Total Area (ha) Disturbed Cuttenio Cutt	
	Α	A-G	1.40	0.14	5.11	2.05	0.07	0.01	232	46.40	7.38	0.74	49.34
^	В	B-G	1.40	0.14	4.79	1.92	0.09	0.02	223	44.60	2.38	0.24	46.91
	6	C-E-G	1.50	0.15	4.98	1.99	0.10	0.02	231	46.20	1.48	0.15	48.51
		C-G	1.30	0.13	4.73	1.89	0.09	0.02	186	37.20	1.73	0.17	39.41
В	C	C-G	2.10	0.21	5.50	2.20	0.20	0.04	195	39.00	14.82	1.48	42.93
B1	В	B-G	1.70	0.17	5.29	2.12	0.16	0.03	185	37.00	10.96	1.10	40.41
C	C	C-G	1.90	0.19	4.49	1.80	0.19	0.04	153	30.60	7.77	0.78	33.40
	Crit	eria Weight	0.10		0.40		0.20		0.20	)	0.2	1.00	

## TABLE 18. WEIGHTED CRITERIA FOR CROSSINGS, PLAZAS AND ACCESS ROADS END TO END
Performance Measure	Ecological	Landscapes		Communities	s / Ecosystem	IS	Populations / Species		Designated Natural Areas		
Criteria / Indicator	Impacts to Lands	Ecological scapes	Impacts to Comm Ecosy	Terrestrial unities / /stems	Impacts t Comm Ecosy	o Aquatic unities / rstems	Impacts to S Risk	npacts to Species at Impacts to Designated Risk Natural Areas		Total Weighted	
Route	Weighted Indicator Score	Weighted Criterion Score	Weighted Indicator Score	Weighted Criterion Score	Weighted Indicator Score	Weighted Criterion Score	Provincially Rare Specimens <i>I</i> Colonies	Weighted Criterion Score	Total Area (ha) Disturbed	Weighted Criterion Score	00016
Alt1A-Plaza A	8.60	0.86	4.67	1.87	0.49	0.10	142	28.4	54.49	5.45	36.68
Alt1A-Plaza B or C	8.60	0.86	2.56	1.02	0.46	0.09	102	20.4	44.34	4.43	26.81
Alt1AOpt2-Plaza A	8.60	0.86	4.98	1.99	0.33	0.07	134	26.8	54.82	5.48	35.20
Alt1AOpt2-Plaza B or C	8.60	0.86	2.84	1.14	0.24	0.05	92	18.4	44.67	4.47	24.91
Alt1B-Plaza A	8.60	0.86	4.77	1.91	0.50	0.10	152	30.4	54.18	5.42	38.68
Alt1B-Plaza B or C	8.60	0.86	2.58	1.03	0.47	0.09	112	22.4	44.10	4.41	28.80
Alt1BOpt2-Plaza A	8.60	0.86	4.77	1.91	0.50	0.10	152	30.4	54.51	5.45	38.72
Alt1BOpt2-Plaza B or C	8.60	0.86	2.96	1.18	0.23	0.05	103	20.6	44.62	4.46	27.15
Alt2A-Plaza A	8.60	0.86	5.46	2.18	0.49	0.10	162	32.4	55.54	5.55	41.10
Alt2A-Plaza B or C	8.60	0.86	3.30	1.32	0.44	0.09	122	24.4	46.07	4.61	31.27
Alt2AOpt2-Plaza A	8.60	0.86	5.54	2.21	0.13	0.03	155	31	55.26	5.53	39.63
Alt2AOpt2-Plaza B or C	8.60	0.86	3.39	1.36	0.10	0.02	116	23.2	45.79	4.58	30.02
Alt2B-Plaza A	8.60	0.86	5.16	2.06	0.50	0.10	145	29	53.88	5.39	37.41
Alt2B-Plaza B or C	8.60	0.86	3.00	1.20	0.46	0.09	105	21	44.41	4.44	27.59
Alt2BOpt2-Plaza A	8.60	0.86	5.26	2.11	0.50	0.10	145	29	53.61	5.36	37.43
Alt2BOpt2-Plaza B or C	8.60	0.86	3.11	1.24	0.46	0.09	105	21	44.14	4.41	27.61
Alt3-Plaza A	8.60	0.86	4.55	1.82	0.35	0.07	131	26.2	53.50	5.35	34.30
Alt3-Plaza B or C	8.60	0.86	2.47	0.99	0.31	0.06	92	18.4	43.38	4.34	24.65
Parkway-Plaza A	8.60	0.86	5.74	2.30	0.74	0.15	180	36	48.87	4.89	44.19
Parkway-Plaza B or C	8.60	0.86	4.71	1.88	0.72	0.14	141	28.2	45.04	4.50	35.59
Criteria Weight	0.10		0.	40	0.	20	0.20		0.1	10	1.00

### TABLE 18. WEIGHTED CRITERIA FOR CROSSINGS, PLAZAS AND ACCESS ROADS END TO END

	-			
Plaza	From	Section	Total Weighted	Relative Impact
C	Crossing	C-G	33.40	3
Δ	C	C-G	39.40	2
B1	B	B-G	40.41	2
B	C	C-G	42.93	2
A	B	B-G	46.91	<u> </u>
A	C	C-E-G	48.51	1
Α	A	A-G	49.34	1
Access F	Roads		Total Weighted Score	Relative Impact Score
Alt3-Plaza	a B or C		24.65	3
Alt1AOpt2	2-Plaza B or C		24.91	3
Alt1A-Pla	za B or C		26.81	3
Alt1BOpt2	2-Plaza B or C	A	27.15	3
Alt2B-Pla	za B or C	¢.	27.59	3
Alt2BOpt2	2-Plaza B or C		27.61	3
Alt1B-Pla	za B or C 🔬		28.80	3
Alt2AOpt2	2-Plaza B or C		30.02	3
Alt2A-Pla	za B or C 🛛 🚽		31.27	3
Alt3-Plaza	a A	ł	34.30	2
Alt1AOpt2	2-Plaza A		35.20	2
Parkway-	Plaza B or C		35.59	3*
Alt1A-Pla	za A		36.68	2
Alt2B-Pla	za A		37.41	2
Alt2BOpt2	2-Plaza A		37.43	2
Alt1B-Pla	za A		38.68	2
Alt1BOpt2	2-Plaza A		38.72	2
Alt2AOpt2	2-Plaza A		39.63	2
Alt2A-Pla	za A		41.10	2
Parkway-	Plaza A		44.19	2*

### TABLE 19. TOTAL WEIGHTED SCORES FOR CROSSINGS, PLAZAS AND ACCESS ROADS END TO END

\* Relative impact score reflects opportunities for ecological restoration available with the Parkway.

Access Road 1B from Plaza A will result in the loss of 25.78 ha of terrestrial communities and 1.32 ha of aquatic communities. This includes 1.46 ha of provincially rare vegetation communities and 152 specimens/colonies of species at risk. A total of 54.18 ha of designated natural areas is located on adjacent lands. Access Road 1B from Plazas B or C will result in the loss of 17.30 ha of terrestrial communities and 1.17 ha of aquatic communities. This includes 0.43 ha of provincially rare vegetation communities and 112 species at risk. A total of 44.10 ha of designated natural areas is located on adjacent lands. Option 2 from Plaza A will result in the loss of 25.79 ha of terrestrial communities and 1.32 ha of aquatic communities. This includes 1.46 ha of provincially rare vegetation communities and 1.32 ha of aquatic communities. This includes 1.46 ha of provincially rare vegetation communities and 1.32 ha of aquatic communities. This includes 1.46 ha of provincially rare vegetation communities and 1.32 ha of aquatic communities. This includes 1.46 ha of provincially rare vegetation communities and 1.32 ha of aquatic communities. This includes 1.46 ha of provincially rare vegetation communities and 1.32 ha of aquatic communities. This includes 1.46 ha of provincially rare vegetation communities and 1.52 specimens/colonies of species at risk. A total of 54.51 ha of designated natural areas is located on adjacent lands. Option 2 from Plazas B or C will result in the loss of 19.28 ha of terrestrial communities and 0.49 ha of aquatic communities. This includes 0.54 ha of provincially rare vegetation communities and 103 specimens/colonies of species at risk. A total of 44.62 ha of designated natural areas is located on adjacent lands.

Access Road 2A from Plaza A will result in the loss of 28.22 ha of terrestrial communities and 1.30 ha of aquatic communities. This includes 2.22 ha of provincially rare vegetation communities and 162 specimens/colonies of species at risk. A total of 55.54 ha of designated natural areas is located on adjacent lands. Access Road 2A from Plazas B or C will result in the loss of 19.75 ha of terrestrial communities and 1.11 ha of aquatic communities. This includes 1.19 ha of provincially rare vegetation communities and 122 specimens/colonies of species at risk. A total of 46.07 ha of designated natural areas is located on adjacent lands. Option 2 from Plaza A will result in the loss of 26.68 ha of terrestrial communities and 0.40 ha of aquatic communities. This includes 2.22 ha of provincially rare vegetation communities and 155 specimens/colonies of species at risk. A total of 55.26 ha of designated natural areas is located on adjacent lands. Option 2 from Plaza B or C will result in the loss of 20.43 ha of aquatic communities and 0.26 ha of aquatic communities. This includes 1.18 ha of provincially rare vegetation communities and 116 specimens/colonies of species at risk. A total of 45.79 ha of designated natural areas is located on adjacent lands.

Access Road 2B from Plaza A will result in the loss of 27.07 ha of terrestrial communities and 1.31 ha of aquatic communities. This includes 1.86 ha of provincially rare vegetation communities and 145 specimens/colonies of species at risk. A total of 53.88 ha of designated natural areas is located on adjacent lands. Access Road 2B from Plazas B or C will result in the loss of 18.70 ha of terrestrial communities and 1.17 ha of aquatic communities. This includes 0.82 ha of provincially rare vegetation communities and 105 species at risk. A total of 44.41 ha of designated natural areas is located on adjacent lands. Option 2 from Plaza A will result in the loss of 27.84 ha of terrestrial communities and 1.31 ha of aquatic communities. This includes 1.86 ha of provincially rare vegetation communities and 1.31 ha of aquatic communities. This includes 1.86 ha of provincially rare vegetation communities and 1.45 specimens/colonies of species at risk. A total of 53.61 ha of designated natural areas is located on adjacent lands. Option 2 from Plaza A will result in the loss of 19.47 ha of aquatic communities and 1.17 ha of aquatic communities and 1.44 ha of designated natural areas is located on adjacent lands. Option 2 from Plaza A total of 53.61 ha of designated natural areas is located on adjacent lands. Option 2 from Plazas B or C will result in the loss of 19.47 ha of terrestrial communities and 1.17 ha of aquatic communities. This includes 0.82 ha of provincially rare vegetation communities and 1.05 specimens/colonies of species at risk. A total of 54.14 ha of designated natural areas is located on adjacent lands.

Access Road 3 from Plaza A will result in the loss of 23.25 ha of terrestrial communities and 0.82 ha of aquatic communities. This includes 1.48 ha of provincially rare vegetation communities and 131 specimens/colonies of species at risk. A total of 53.50 ha of designated natural areas is located on adjacent lands. Access Road 3 from Plazas B or C will result in the loss of 15.36 ha of terrestrial communities and 0.67 ha of aquatic communities. This includes 0.50 ha of provincially rare vegetation communities and 92 specimens/colonies of species at risk. A total of 43.38 ha of designated natural areas is located on adjacent lands.

The Parkway from Plaza A will result in the loss of 42.59 ha of terrestrial communities and 2.14 ha of aquatic communities. This includes 2.54 ha of provincially rare vegetation communities and 180 specimens/colonies of species at risk. A total of 48.87 ha of designated natural areas is located on adjacent lands. The Parkway Plan from Plazas B or C will result in the loss of 37.21 ha of terrestrial communities and 2.03 ha of aquatic communities. This includes 1.47 ha of provincially rare vegetation communities and 141 specimens/colonies of species at risk. A total of 45.04 ha of designated natural areas is located on adjacent lands. The Parkway alternative includes over 80 hectares of new green space. A portion of this new green space is available for habitat creation, restoration and enhancement including re-establishing natural linkages across Huron Church/Highway 3, as the access road and service roads are in tunnels in several locations. The increased greenspace available with the Parkway alternative can also be used to restore and enhance aquatic habitat in Wolfe Drain, Cahill Drain, Lennon Drain and Turkey Creek to achieve a net gain of productive fish habitat.

All access roads will impact 22 ecological landscapes of moderate to low sensitivity.

Access Roads 1A, 1B, 3 and the Parkway will encroach on the St. Clair College Prairie ESA; Access Roads 2A and 2B will not.

### Conclusions

Each access road that connects Plazas B or C with the existing Highway 401 performs better than its corresponding access road that connects Plaza A with the existing Highway 401. All access roads result in the same number and significance of ecological landscapes that will be displaced.

Based on the results of the quantitative and qualitative evaluations, there is no significant difference between Alternative 1A and 2A (at grade), Alternative 1B and 2B (depressed), Alternative 3 (tunnel) and the Parkway (depressed with 11 tunnels) in terms of potential impacts to natural heritage features.

The evaluation of practical alternatives is based on the impacts of displacement that may occur within the footprint area of the proposed facility, and disruption that may occur on adjacent lands located within approximately 120 metres of the proposed facility. These criteria address the impacts of the proposed crossing, plaza and access road based on its horizontal plan, but they do not take into consideration the vertical profile of the proposed access road. For example, an at-grade access road (Alternatives 1A and 2A) will have the least direct impact on surface water, because watercourses can be spanned with a bridge or culvert. Below grade alternatives (1B, 2B, 3 and the Parkway) require modification to watercourse alteration can generally be addressed through avoidance, design modifications, mitigation and compensation.

Below grade alternatives may also require dewatering during construction which could have a potential impact on adjacent natural heritage features. While the effects of dewatering can be mitigated using cut-off walls, timing and duration restrictions, artificial recharge and other methods, these construction techniques are more complex and pose a higher risk to adjacent natural heritage features.

Both the tunnel and Parkway options offer greater opportunities for ecological restoration and enhancement than at grade alternatives. The Parkway offers a distinct advantage by placing both the freeway and service road in a tunnel in several locations creating opportunities for unobstructed cross-corridor ecological linkages. The significant ecological benefits of the Parkway outweigh the complexities associated with preventing groundwater impacts. In addition, although the Parkway impacts a larger area of terrestrial communities than the other alternatives, the additional communities affected do not include provincially designated natural areas. Again, the effects of the Parkway are offset by the significant benefits associated with the opportunities for ecological restoration and enhancement.

The difference among access roads is more closely related to their destination. Each access road that leads to Plazas B or C is preferred to its corresponding access road that leads to Plaza A. As a result, access roads leading to Plazas B or C were assigned an impact score of "3" (low impact), while access roads leading to Plaza A were assigned an impact score of "2" (moderate impact).

While the total weighted score of the Parkway to Plazas B or C is equivalent to a "2" (moderate impact), the impact score of "3" has been assigned to take into consideration the tremendous opportunity for ecological restoration and enhancement associated with the Parkway alternative. For example, the Wolfe Drain will be realigned to create new habitat with increased structure and diversity. In addition, opportunities for habitat restoration on the surplus lands in the buffer areas will be explored. The naturalized roof of the tunneled sections can provide habitat and linkages opportunities at key locations. Similarly, the Parkway to Plaza A performs below the access roads leading to Plaza A and was assigned an impact score of "1" (high impact) based on the arithmetic evaluation. Based on further qualitative review, the impact score was increased from "1" to "2" for the same reasons stated above.

### 2.4.3.2 Crossings and Plazas

The crossings and plazas are illustrated in Figure 7 and Appendix K.

### Review of Information

Plaza A from Crossing A will result in the loss of 32.58 ha of terrestrial communities and 0.22 ha of aquatic communities. This includes 2.98 ha of provincially rare vegetation communities and 232 specimens/colonies of species at risk. A total of 7.38 ha of designated natural areas is located on adjacent lands within 120 m of the facility footprint. Five ecological landscapes will be impacted by this alternative.

Plaza A from Crossing B will result in the loss of 30.77 ha of terrestrial communities and 0.31 ha of aquatic communities. This includes 2.70 ha of provincially rare vegetation communities and 223 specimens/colonies of species at risk. A total of 2.38 ha of designated natural areas is located on adjacent lands. Five ecological landscapes will be impacted by this alternative.

Plaza A from Crossing C through C-E-G near Brighton Beach will result in the loss of 30.87 ha of terrestrial communities and 0.31 ha of aquatic communities. This includes 2.69 ha of provincially rare vegetation communities and 231 specimens/colonies of species at risk. A total of 1.48 ha of designated natural areas is located on adjacent lands. Six ecological landscapes will be impacted by this alternative.

Plaza A from Crossing C through C-G along the Ojibway Parkway will result in the loss 28.29 ha of terrestrial communities and 0.25 ha of aquatic communities. This includes 2.70 ha of provincially rare vegetation communities and 186 specimens/colonies or species at risk. A total of 1.73 ha of designated natural areas is located on adjacent lands. Four ecological landscapes will be impacted by this alternative.

Plaza B from Crossing C will result in the loss of 40.68 ha of terrestrial communities and 0.64 ha of aquatic communities. This includes 2.02 ha of provincially rare vegetation communities and 195 specimens/colonies of species at risk. A total of 14.82 ha of designated natural areas is located on adjacent lands. Ten ecological landscapes will be impacted by this alternative.

Plaza B1 from Crossing B will result in the loss of 45.07 ha of terrestrial communities and 0.59 ha of aquatic communities. This includes 1.09 ha of provincially rare vegetation communities and 185 specimens/colonies of species at risk. A total of 10.96 ha of designated natural

areas is located on adjacent lands. Eight ecological landscapes will be impacted by this alternative.

Plaza C from Crossing C will result in the loss of 36.23 ha of terrestrial communities and 0.56 ha of aquatic communities. This includes 0.89 ha of provincially rare vegetation communities and 153 specimens/colonies of species at risk. A total of 7.77 ha of designated natural areas is located on adjacent lands. Ten ecological landscapes will be impacted by this alternative.

Plaza B will encroach on the Black Oak Woods ANSI/ESA. No other plazas will encroach on designated natural areas.

### Conclusions

The crossings and plazas that displace the least area of provincially rare vegetation communities are preferred given the high level of importance assigned to these features by the DRIC study team. As a result, Plaza C is the most preferred plaza, followed by Plazas B and B1, followed by Plaza A.

Crossing C to Plaza C will result in the least displacement of provincially rare vegetation communities and species at risk and a relatively low to moderate level of potential disturbance to designated natural areas located on adjacent lands. This combination has a relatively higher level of displacement of ecological landscapes and aquatic communities than the other alternatives. The total weighted score for this alternative is considerably lower than the total weighted score for the next best alternative making this alternative clearly preferred to the other alternatives.

Crossing C to Plaza B and Crossing B to Plaza B1 will result in a lower level of displacement of provincially rare vegetation communities and species at risk than Plaza A and its associated crossings, with the exception of Crossing C to Plaza A through C-G, which will displace fewer species at risk. Crossing C to Plaza B and Crossing B to Plaza B1 have the greatest potential to disturb designated natural heritage features located on adjacent lands, as these plazas are located adjacent to the Black Oak Woods ANSI, ESA and CNHS. The southeast corner of Plaza B will displace a small area of the Black Oak Woods ANSI, ESA and CNHS. No other plazas or crossings will displace any designated natural heritage areas. Plaza B and B1 are located in the Brighton Beach area. While both of these plazas are preferred to Plaza A (except Crossing C to Plaza A through C-G), they do not perform as well as Plaza C.

Plaza A and its associated crossings have the least impact on ecological landscapes, terrestrial communities, aquatic communities and designated natural areas located on adjacent lands. However, Plaza A and its associated crossings have the greatest impact on provincially rare vegetation communities and species at risk (with the exception of Crossing C to Plaza A through C-G). Given the importance assigned to these provincially rare vegetation communities and species at risk by the DRIC study team, Plaza A and its associated crossings are considered least preferred.

The exception is Plaza A from Crossing C through segment C-G which is the second most preferred alternative because it has the least displacement of ecological landscapes, the least displacement of terrestrial and aquatic communities and a relatively moderate level of displacement of species at risk. While Plaza A is least preferred from a natural heritage perspective, segment C-G is the most preferred because it avoids the natural heritage

features associated with the Brighton Beach area. The connection between Crossing C and Plaza A along Ojibway Parkway (Segment C-G) verses through the Brighton Beach area (Segment C-E-G) increases the preference of this alternative from least preferred to the second most preferred, on par with the Plaza B and Plaza B1 alternatives.

Based on the results of the quatitative and qualitative evaluations, Plaza C from Crossing C stands alone as the alternative with the least relative impact to natural heritage features and was assigned an impact score of "3" (low impact). Plaza A from Crossing C (Segment C-G), Plaza B1 from Crossing B and Plaza B from Crossing C, represent the alternatives with the next least relative impact to natural heritage features and were assigned an impact score of "2" (moderate impact). The remaining Plaza A alternatives, including Plaza A from Crossing B, Plaza A from Crossing C (Segment C-E-G) and Plaza A from Crossing A represent the alternatives with the greatest relative impact to natural heritage features and were assigned an impact score of "1" (high impact).

2.5 Assessment of Impacts

The *Draft Natural Heritage Work Plan* (Border Transportation Partnership 2005) indicates that the assessment of impacts will be addressed in a generic manner at the practical alternatives stage. The rationale for this approach is that site-specific environmental effects cannot be assessed until a technically preferred alternative is selected. However, the information contained in Table 15 and described previously that was used to evaluate practical alternatives provides a good indication of the potential impacts of each practical alternative on landscape ecology, terrestrial and aquatic ecosystems/communities, species at risk and adjacent designated natural areas. Based on a review of this table, it is concluded that all crossing, plaza and access road alternatives will result in the loss of provincially rare vegetation communities and species at risk. It is not possible to avoid all of these important natural heritage features. The practical alternatives that avoid or reduce the area or number of these valued ecosystem components are considered preferred by the natural heritage discipline. Given that is is not possible to avoid all provincially rare vegetation communities and species at risk are considered preferred by the natural heritage discipline. Given that is is not possible to avoid all provincially rare vegetation communities and species at risk are considered preferred by the natural heritage discipline. Given that is is not possible to avoid all provincially rare vegetation communities and species at risk, mitigation measures are required to reduce the adverse effects of the project on natural heritage.

2.6

# **Environmental Protection Measures**

The *Draft Natural Heritage Work Plan* (Border Transportation Partnership 2005) indicates that the environmental protection measures to be considered at the practical alternatives stage include avoidance of natural heritage features, minimization of the loss of natural heritage features and generic mitigation measures typically incorporated into the design of linear transportation facilities. Once again, given that it is not possible to avoid all provincially rare vegetation communities and species at risk, generic mitigation strategies are required to reduce the adverse effects of the project.

It should be noted that the most important natural heritage features (i.e. the Ojibway Prairie Complex, the Detroit River Marshes, etc.) located in the preliminary analysis area were mostly avoided during the evaluation of illustrative alternatives and in establishing the ACA. Avoidance is considered the most effective environmental protection measure and it has been the primary goal of the DRIC study team throughout the route planning study.

# 2.6.1 Provincially Rare Vegetation Communities

In the case of provincially rare vegetation communities, in particular tallgrass prairies, the goal of the Border Transportation Partnership is to ensure no net loss of the area or function of these natural heritage features. A number of compensation strategies are available to offset this adverse effect in order of preference including: enhance existing natural remnants; enlarge existing natural remnants; and, establish new tallgrass prairies. These strategies are generic since the ultimate selection of a compensation strategy will depend on the condition and availability of suitable sites.

### 2.6.1.1 Enhance Existing Natural Remnants

This strategy is the most preferred compensation approach, since it benefits an existing community and may not require an intensive management effort. This approach identifies existing remnants of tallgrass prairie in the local area that are showing inherent prairie features or functions such as prairie flora, sandy soils or lack of tree cover. This strategy involves an assessment of the needs of the natural community, which may include one or many management techniques such as planting, burning, or tree cutting. There are many examples of restoring (improving quality) remnant tallgrass prairie communities including the Ojibway Prairie in Windsor, Ontario, High Park in Toronto, Ontario and the Konza Prairie in Kansas.

### 2.6.1.2 Enlarge Existing Natural Remnants

This strategy involves adding new area to an existing prairie remnant. This is likely to involve a more intensive restoration strategy to establish site conditions suitable for prairie plants. Plantings can be achieved through collection and hand broadcast of seed from the adjacent unit or through the natural spread of prairie seed.

## 2.6.1.3 Establish New Tallgrass Prairie

This strategy involves the establishment of tallgrass prairie communities on newly disturbed, existing agricultural or degraded land. This is likely to involve the most intensive restoration strategy to recreate the ecology of a natural prairie community. This type of restoration has been successfully conducted through three methods; seeding, planting seedlings, or by transferring sod from an intact prairie. Commonly, a seeding approach is undertaken which requires a long time to fully establish due to the germination cycle of seeds. Also, done equally often is the planting of plant plugs, which is more expensive but gives a quicker response. Transferring sod from an intact prairie can be quite successful due to the transfer of soil microorganisms, seed bank, and soil materials. This approach requires a careful and immediate placement once removed to ensure the viability of all biota in the sod.

All of the above strategies to establish new tallgrass prairie require an active plan including long term management. This plan needs to be site-specific to conditions such as soil types, topography, and soil moisture. Prairie has been established on a variety of existing agricultural fields or other degraded sites. However, the condition of the existing site will determine how effective the restoration will be (endpoint) and how much initial preparation is required.

In addition to site preparation, the plan needs to document planting methods, species selection, and long term management. Prairies are maintained by disturbance, historically, through wildfire. Ideally, prairies should be periodically subjected to a prescribed fire (Delaney et al. 2000, Schramm 1990). The incorporation of fire needs to be considered at the onset of the project since it may affect site selection, species selection as well as who will carry out the long term management.

This approach also has an inherent unpredictability, as restoration is an applied science which is subject to weather, introduced species, and timing. It is also important to stress that current restoration methods are unable to restore exact plant diversity in tallgrass prairie, as would be seen in a remnant tallgrass prairie (Martin et al. 2005). Van Dyke et al. suggest that to achieve high-functioning native prairie communities large areas are required as well as long term efforts including introductions of species of high conservation value. Several examples where this strategy has been applied include the Pioneer Prairie in Texas, Fermilab in Batavia, Illinois and roadside planting projects undertaken in Ontario and elsewhere.

Roadside planting projects have been undertaken throughout the United States and Ontario. The Ontario Ministry of Transportation has undertaken research on this subject and has produced a report entitled "Wildflower and Prairie Seeding Recommendations for Ontario Roadsides." This document reviews a number of approaches, and describes the most effective strategies for roadside plantings including topics such as soil preparation, seed mixes and maintenance. Thus success can be achieved with careful initial assessment of conditions and the implementation of an appropriate plan.

# 2.6.2 Species at Risk

The proposed project will result in the loss of plant and animal species and their habitat that are provincially rare (S1 to S3), listed by COSEWIC and COSSARO (Endangered, Threatened or Special Concern) or regulated under the SARA and the new OESA.

Environmental protection measures typically used to mitigate the loss of species at risk and their habitat include avoidance, integration and relocation. The DRIC study team has made every reasonable attempt to avoid provincially rare habitats and species at risk. However, in areas where avoidance cannot be achieved, attempts will be made to incorporate species at risk and their habitat into site plans to the extent feasible. Once these opportunities have been exhausted, salvage and relocation efforts will be considered. The DRIC study team will explore salvage opportunities for plants including: transplanting of live plant material; the collection and broadcasting of seeds; and, the stripping, relocation and placement of sod.

The DRIC study team conducted a preliminary investigation into the feasibility of capturing and relocating eastern foxsnake (*Elaphe gloydl*) and Butler's gartersnake (*Thamnophis butler*). The investigation included a review of scientific publications and communication with experts in the field of snake relocation. The results of the review of scientific publications proved inconclusive as no research has been conducted to determine if Butler's gartersnake or eastern foxsnake can be successfully captured and relocated.

Several biologists in Ontario and the United States, currently studying the feasibility and success rates of relocated snakes were contacted to obtain opinions on the possibility of a relocation program with Butler's gartersnake and eastern foxsnake. Despite the fact that these biologists would be considered experts in this field, they had little information to offer,

due to the absence of experience or information related to the relocation of Butler's gartersnake and eastern foxsnake (Pratt, personal communication, 2007). Eastern Massasauga snakes bred in captivity at the Metro Toronto Zoo were recently introduced into the Ojibway Prairie Complex with mixed results. Several of these introduced snakes found winter hibernacula on their own, but others had to be actively encouraged to enter hibernacula (Pratt, personal communication 2007).

Based on the results of the preliminary investigation, the success rate for relocation of Butler's gartersnake and eastern foxsnake is unknown. Given the Butler's gartersnake's affinity to tallgrass prairies and its limited home range (< 300 m), relocation may present a challenge. On the other hand, eastern foxsnake may be more suitable for relocation given its compatibility with many habitat types (including human-made) and its broad home range. The capture and relocation of these two snake species as a mitigation strategy for this project offers an excellent opportunity to conduct primary scientific research.

The strategies for managing species at risk and their habitats will be developed in consultation with regulatory agencies and in compliance with the SARA and the new OESA.

## 2.6.3 Groundwater

Based on a review of groundwater conditions by Golder Associates (2006) it was determined that creating permanent, open, and depressed roadways within the native clays using slopes or supported with retaining walls (that do not cut off groundwater pressure gradients from adjacent higher grades) will result in a permanent lowering of the groundwater level within the clay soils. Based on the limited available information, and for preliminary planning purposes, it is anticipated that the zone of influence of such groundwater lowering within the silty clay should be assumed to be a distance equal to about 5 to 10 times the depth of cut. Such groundwater lowering will induce settlement within the silty clay subsoils within this zone. It is anticipated that if low permeability in situ walls (e.g. contiguous caisson walls or concrete diaphragm walls) are used for excavation support or for permanent below grade structures, that the influence of the excavation on near-surface groundwater would be minimal. As a result, no changes to the composition or structure of the tallgrass prairies are anticipated if cut-off walls are used. Further refinement of this zone of influence and the magnitude of potential settlement requires additional site-specific investigation and analyses.

2.6.4

### Surface Water

A depressed or tunnel highway profile will require alteration of existing watercourses through diversion, enclosure, siphoning or aquaducting depending on the characteristics of the watercourse and the depth of the highway below existing grade. Any harmful alteration of these watercourses is subject to the requirements of the *Fisheries Act*. Since none of these watercourses directly support critical fish habitat, the full suite of environmental protection options, including fish habitat compensation to maintain no net loss of the productive capacity of fish habitat, are available. Environmental protection measures to be employed for each watercourse crossing will be determined in consultation with regulatory agencies and in compliance with the *Fisheries Act*.

A more detailed assessment of impacts and recommendations for environmental protection measures will be performed at the concept design alternatives stage.

# 2.7 Conclusions

The ACA identified during the evaluation of illustrative alternatives avoids most of the important natural heritage features associated with the designated Ojibway Prairie Complex. Data collection and analysis performed within the ACA to evaluate practical alternatives confirms the presence of remnant natural heritage features that support provincially rare species and their habitat. Some of the practical alternatives avoid more of the provincially rare species and habitats than others; none of the practical alternatives avoid all natural heritage features of provincial importance.

The practical alternatives that are most preferred by the natural heritage discipline include Crossing C to Plaza C and the access roads that lead to Plazas B or C. With the exception of Crossing C to Plaza A along the Ojibway Parkway (Segment C-G), Plaza A is the least preferred plaza alternative and destination for access roads. At-grade and depressed highway profiles are considered slightly more preferred than a tunnel or partial tunnel due to less potential risk to natural heritage features, but there is no significant difference among these highway profile alternatives because the area that will be displaced by the highway footprint is similar.

Environmental protection measures that go beyond avoidance will be required to minimize, mitigate and compensate for adverse environmental effects on natural heritage features. By using the full suite of environmental protection measures including habitat restoration, none of the practical alternatives will result in significant adverse environmental effects on natural heritage features. Site-specific environmental impacts and environmental protection measures will be analyzed for the technically preferred alternative during the concept alternatives stage.

# 3.0 **R**EFERENCES

Alex, J.F. 2001. Publication 505: Ontario Weeds: Descriptions, Illustrations and Keys to their Identification. Ontario Ministry of Agriculture, Food and Rural Affairs.

Betz, R.F., R.J. Lootens and M.K. Becker. 1997. Two Decades of Prairie Restoration at Fermilab, Batavia, Illinois.

Bibby, C.J., N.D Burgess, and D.A. Hill. 1992. Bird Census Techniques. Published for the British Trust for Ornithology and The Royal Society for the Protection of Birds. Academic Press, Harcourt Brace and Co., London.

Bishop, C. A. and K. E. Pettit. 1992. Declines in Canadian Amphibian Populations: designing a national monitoring strategy. Occasional paper No. 76, CWS.

Black, S.H., M. Shepard and M. Mackey Allen. 2001. Endangered Invertebrates: the case for greater attention to invertebrate conservation. Xerces Society, Endangered Species UPDATE. Vol. 18(5): 42-50.

Border Transportation Partnership. 2005. Detroit River International Crossing Natural Heritage Work Plan. Prepared for Transport Canada and the Ontario Ministry of Transportation by LGL Limited.

Brown, L. 1979. Grasses An Identification Guide. Sponsored by the Roger Tory Peterson Institute. Houghton Mifflin Company. New York, New York.

Brown, L. 1976. Weeds in Winter. W.W. Norton & Company, Inc., New York.

Buck, M., S.M. Paiero and S.A. Marshall. 2005. New records of native and introduced aculeate Hymenoptera from Ontario, with keys to eastern Canadian species of Cerceris (Crabronidae) and eastern Nearctic species of Chelostoma (Megachilidae). Journal of the Entomological Society of Ontario. 136: 37-52.

Buck, M. and S.A. Marshall. 2006. Revision of New World Loxocera (Diptera: Psilidae), with Phylogenetic Redefinition of Holarctic Subgenera and Species Groups. European Journal of Entomology. 103: 193-219.

Buck, M. 2003. An Annotated Checklist of the Spheciform Wasps of Ontario (Hymenoptera: Ampulicidae and Crabronidae). Journal of the Entomological Society of Ontario. 134: 19-84.

Buck, M. Entomologist, Department of Environmental Biology, University of Guelph. Personal communication, May 2006 to January 2007.

Burke, D. Ecologist. Ministry of Natural Resources, London District and Co-Chair of the Karner Blue Recovery Team. Personal communication, April 2006.

Cadman, M.D., P.F. J. Eagles, and F.M. Helleiner. 1987. Atlas of the Breeding Birds of Ontario. Federation of Ontario Naturalists and Long Point Bird Observatory. Toronto.

Cain, N. 1997. Wildflower and Prairie Seeding Recommendations for Ontario Roadsides. Ministry of Transportation: Research and Development Branch. MAT 97-03. Canadian Museum of Nature. 2006. Biological Survey of Canada – Terrestrial Arthropods. http://www.biology.ualberta.ca/bsc/english/insectfauna.htm/.

Carmichael, I., A. Vance and A. MacKenzie. 2006. Photo Field Guide to Some Wildflowers of Southern Ontario. St. Thomas Field Naturalist Club Incorporated. St. Thomas, Ontario.

Celestino, M. 2002. Wildflowers of the Canadian Erie Islands (Including Flowering Shrubs and Vines). Essex County Field Naturalists Club. Print Craft Limited. Windsor, Ontario.

Christiansen, P.A. 1995. Establishment of prairie species by overseeding into burned roadside vegetation. Proceedings of the 14<sup>th</sup> Annual North American Prairie Conference. P. 167.

Ciborowski, J. Researcher, Department of Biological Sciences, University of Windsor. Personal communication, April 2006.

City of Windsor. 2004a. The City of Windsor Official Plan. Volume 1: The Primary Plan. Office Consolidation: September 1, 2004.

City of Windsor. 2004b. The City of Windsor Official Plan. Volume 2: Special Policy Areas and Secondary Plans. Office Consolidation: September 1, 2004.

City of Windsor. Department of Planning. 1996. Spring Garden Complex Environmental Evaluation Report. City of Windsor. Windsor, Ontario.

City of Windsor. 1992. City of Windsor Candidate Natural Heritage Site Biological Inventory Evaluation Report. Prepared by Essex Region Conservation Authority and the City of Windsor Department of Planning and Department of Parks and Recreation. December 1992. 212 pp.

Cobb, B., E. Farnsworth, and C. Lowe. 2005. A Field Guide to Ferns and Their Related Families. Northeastern and Central North America Second Edition. Peterson Field Guide Series. Houghton Mifflin Company. Boston.

Coombes, A.J. 2000. Dorley Kindersley Handbooks: Trees The Most Accessible Recognition Guides. Dorley Kindersley Limited. New York, New York.

Corporation of the Town of Amherstburg. 1999. The Corporation of the Town of Amherstburg Official Plan. Prepared by Monteith Zelinka Priamo Limited. Office Consolidation: July 6, 1999.

Corkum, L. Researcher, Department of Biological Sciences, University of Windsor. Personal communication, April 2006.

COSEWIC. 2004. Canadian Species at Risk, November 2004. Committee on the Status of Endangered Wildlife in Canada. 58 pp.

Couturier, A. 1999. Conservation Priorities for the Birds of Southern Ontario. Bird Studies Canada. Unpublished Bird Studies Canada Report, 17 pp. plus appendices.

Crow, G.E. and C.B. Hellquist. 2000. Aquatic and Wetland Plants of Northeastern North America. Volume One Pteridophytes, Gymnosperms, and Angiosperms: Dicotyledons. The University of Wisconsin Press. Madison, Wisconsin.

Crow, G.E. and C.B. Hellquist. 2000. Aquatic and Wetland Plants of Northeastern North America. Volume Two Angiosperms: Monocotyledons. The University of Wisconsin Press. Madison, Wisconsin.

Delaney, K. L. Rodger, P. Allen Woodliffe, G. Rhynard, and P. Morris. 2000. Planting the Seed: A Guide to Establishing Prairie and Meadow Communities in Southern Ontario. Environment Canada.

Department of Fisheries and Oceans Canada (DFO). 1999. A Class Authorization System for Agricultural Drains in the Southern Ontario Region.

Detroit River Canadian Cleanup Committee. 1999. Detroit River Update Report. Great Lakes Institute for Environmental Research. Windsor, Ontario. November 1999.

Detroit River Management Strategy Committee and the Essex Region Conservation Authority. 2001. A Management Strategy for the Detroit River As A Canadian Heritage River. October 2000. 37 pp.

Detroit River Management Strategy Committee and the Essex Region Conservation Authority. 1998. Detroit River Background Report. 149 pp. + appendices.

Dickinson, T., D. Metsger, J. Bull and R. Dickinson. 2004. The ROM Field Guide To Wildflowers of Ontario. McClelland & Stewart Ltd. Toronto, Ontario.

Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists. Don Mills, Ontario.

Dorling Kindersley. 2005. DK Eyewitness Companions Trees: Identifications. Forests. Historic Species. Wood Types. Dorley Kindersley Limited. New York, New York.

Elbroch, M. 2003. Mammal Tracks & Sign. A Guide to North American Species. Stackpole Books, Mechanicsburg, PA.

Environment Canada. 2006. Species at Risk: Frosted Elfin, Karner Blue, Monarch, Wavyrayed Lampmussel, Snuffbox, Round Pigtoe, Rayed Bean, Northern Riffleshell, Mudpuppy Mussel, and Round Hickorynut. http://www.speciesatrisk.gc.ca/.

Essex Region Conservation Authority. 1994. Environmentally Significant Areas Status Update. Unpublished report. Essex Region Conservation Authority, Essex, Ontario.

Farrar, J.L. 1995. Trees in Canada. Fitzhenry and Whiteside Limited and the Canadian Forest Service. Markham, Ontario.

Forman, R.T. and M. Godran. 1986. Landscape Ecology. John Wiley and Sons. Mississauga, Ontario.

Gleason, H.A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. New York Botanical Garden Press. New York.

Golder Associates Ltd. 2006. Interim Report on Geotechnical Considerations for Below-Grade Approach Roadways, Cut and Cover, and Tunnel Options. Detroit River International Crossing Mississauga, Ontario. Government of Canada. 2006. Committee on the Status of Endangered Wildlife in Canada (COSEWIC) database. http://www.cosewic.gc.ca/eng/sct5/index e.cfm/.

Government of Canada. 2006. Species at Risk Acts: Frosted Elfin, Karner Blue, Monarch, Wayvy-rayed Lampmussel, Snuffbox, Round Pigtoe, Rayed Bean, Northern Riffleshell, Mudpuppy Mussel, Round Hickorynut, and Kidneyshell. http://www.sararegistry.gc.ca/species/.

Government of Canada. 2005. Species at Risk Act Public Registry. Government of Canada. http://www.sararegistry.gc.ca/gen\_info/default\_e.cfm/. Last updated March 1, 2005.

Government of Canada. 2004. COSEWIC Assessment and Status Report on the Round Pigtoe (Pleurobema sintoxia) in Canada. c/o Canadian Wildlife Service. Environment Canada. Ottawa. Ontario.

Government of Canada. 2003a. COSEWIC Assessment and Status Report on the Round Hickorynut (Obovaria subrotunda) in Canada. c/o Canadian Wildlife Service. Environment Canada. Ottawa, ON.

Government of Canada. 2003b. COSEWIC Assessment and Status Report on the Kidneyshell (Ptychobranchus fasciolaris) in Canada. c/o Canadian Wildlife Service. Environment Canada. Ottawa, ON.

Graves, A.H. 1992. Illustrated Guide to Trees and Shrubs. A Handbook of the Woody Plants of the Northeastern United States and Adjacent Canada. Revised Edition. Dover Publications, Inc., Mineola, New York.

Hamilton, K.G.A. 1994. Leafhopper evidence for origins of northeastern relict prairies (Insecta: Homoptera: Cicadellidae). Pp 61-70 In R.G. Wickett, P.D. Lewis, A. Woodliffe and P. Pratt (eds.) Proceedings of the Thirteenth North American Prairie Conference: Spirit of the Land, Our Prairie Legacy. Department of Parks and Recreation, Windsor, Canada. 262 pp.

Hamilton, K.G.A. 1990. Grasslands of Ontario and surrounding areas. Arthropods of Canadian Grasslands Newsletter 5:2-10.

Harlow, W.M. 1954. Fruit Key & Twig Key to Trees & Shrubs. Fourth Revised Edition. Dover Publications, Inc., New York, New York.

Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek and M.S. Foster. 1994. Measuring and Monitoring Biological Diversity. Standard Methods for Amphibians. Smithsonian Institution Press, Washington and London.

Hitchcock, A.S. revised by A. Chase. 1971a. Manual of the Grasses of the United States Second Edition Volume One. Dover Publications, Inc. General Publishing Company, Ltd. Toronto, Ontario.

Hitchcock, A.S. revised by A. Chase. 1971b. Manual of the Grasses of the United States Second Edition Volume Two. Dover Publications, Inc. General Publishing Company, Ltd. Toronto, Ontario.

Hole's L. and J. Fallis. 1997. Lois Hole's Favourite Trees & Shrubs: Add Privacy and Versatility to Your Yard. Lone Pine Publishing. Edmonton, Alberta.

Holmes A.M., Q.F. Hess, R.R. Tasker, A.J. Hanks. 1991. The Ontario Butterfly Atlas. Toronto Entomologists' Association. Toronto. Ontario.

Holmgren, N.H., P.K. Holmgren, R.A. Jess, K.M. McCauley, and L. Vogel. 2004. Illustrated Companion to Gleason and Cronquist's Manual. Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada. New York Botanical Garden Press. New York.

Jonckheere, F. (ed.). 1990. Rare, threatened, or endangered trees in Haldimand-Norfolk. Norfolk Field Naturalists, Simcoe, Ontario.

Jones, C.D. Toronto Entomologists' Association. Personal communication, May 2006.

Jones, Colin D. 2006. Ontario Lepidoptera 2003-2004. Toronto Entomologists' Association. Toronto, Ontario.

Jordan, W.R. III, R.L. Peters II, E.B. Allen. 1998. Ecological restoration as a strategy for conserving biological diversity. Environmental Management. 12: 55-72.

Karns, D.R. 1986. Field Herpetology, Methods for the Study of Amphibians and Reptiles in Minnesota. James Ford Bell Museum of Natural History, University of Minnesota. Occ. Paper No.18:87 pp.

Kershaw, L. 2001. Trees of Ontario Including Tall Shrubs. Lone Pine Publishing. Edmonton, Alberta.

Ladd, D.M. and F. Oberle. 1995. A Falcon Guide: Tallgrass Prairie Wildflowers A Field Guide. Globe Pequot Press. Korea.

Laman, K.A. and D. Cronin. 1996. Building a Prairie. A Guide to Creating Prairie Habitat. In co-operation with the City of Windsor, Ontario Ministry of Natural Resources and Friends of Ojibway Prairie, Inc. Print Craft Limited. Windsor, Ontario.

Lamb, L. and G. Rhynard. 1994. Plants of Carolinian Canada. Federation of Ontario Naturalists. Don Mills, Ontario.

Lapointe, N.W.R., L.D. Corkum and N.E. Mandrak. 2005. A Comparison of Methods for Sampling Fish Diversity in Shallow Offshore Waters of Large Rivers. North American Journal of Fisheries Management 26:503-513.

Layberry. R.A, P.W. Hall, J.D. Lafontaine. 1998. The Butterflies of Canada. University of Toronto Press. Toronto, Ontario.

Lebedyk, D. Biologist. Essex Region Conservation Authority. Personal communication, April 2006.

Lebedyk, D., G. Waldron and P. Pratt. 1991. Flora of the St.Clair College Prairie.

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

Levine C. and D. Rauh.1995. A Guide to Wildflowers in Winter. Herbaceous Plants of Northeastern North America. Yale University Press. BookCrafters, Inc., Chelsea, Michigan.

MacCulloch, R.D. 2002. The ROM Field Guide to amphibians and reptiles of Ontario. Royal Ontario Museum and McClelland & Stewart Ltd., Toronto, ON.

Mackie, G.L. Mollusc Biologist. Zoology Department, University of Guelph. Personal communication, May to December 2006.

Mackie, G.L. 2001. Applied Aquatic Ecosystems Concepts. Kendall/Hunt Publishing Company. Dubuque, Iowa.

MacNaughton, A. Toronto Entomologists' Association. Personal communication, April 2006.

Manny, B. A., T. A. Edsall and E. Jawarski. 1988. The Detroit River, Michigan: An ecological profile biological report. U.S. Fish and Wildlife Service, U.S. Department of Interior. Contribution No. 683 of the National Fisheries Research Centre - Great Lakes. Ann Arbor, MI.

Marshall, S.A. Entomologist. Department of Environmental Biology, University of Guelph. Personal communication, May to August 2006.

Marshall S.A., S.M. Paiero, M. Buck. 2005. Buprestid Sampling at Nests of Cerceris fumipennis (Hymenoptera: Crabronidae) in Southern Ontario: the first Canadian Records of Three Buprestids (Coleoptera: Buprestidae). Canadian Entomologist. 137: 416-419.

Marshall S.A., S.M Paiero, O. Lonsdale. 2004. New Records of Opthoptera from Canada and Ontario. Journal of the Entomological Society of Ontario. 135: 101-107.

Martin, L.M. K.A. Moloney, B.J. Wilsey. 2005 An assessment of grassland restoration success using species diversity components. Journal of Applied Ecology. 42: 327-340.

Mason, T. Biologist. Toronto Zoo. Personal communication. April 2006.

McNicole, K. Mollusc Biology Graduate Student. Zoology Department, University of Guelph. Personal communication, May to August 2006.

MDNR and MOE. 1996. 1996 Detroit River Remedial Action Plan Report. Sarnia, Ontario and Lansing, Michigan. 420 pp.

MDNR and MOE. 1991. Detroit River Remedial Action Plan. Stage 1. Sarnia, Ontario and Lansing, Michigan. June 3, 1991. 504 pp.

Metcalfe-Smith. J, A. MacKenzie, I. Carmichael, D. McGoldrick. 2005. Photo Field Guide to the Freshwater Mussels of Ontario. St. Thomas Field Naturalist Club Incorporated. St Thomas. Ontario.

Ministr7 of Transportation of Ontario (MTO). 1994. Environmental Manual–Fisheries.

Ministry of Transportation of Ontario (MTO). 2002. Draft Environmental Reference for Highway Design.

Ministry of Transportation of Ontariio (MTO)/Ministry of Natural Resources of Ontario (MNR). 1993. Fishereis Protocol for Protecting Fisheries Resources on Provincial Highway Undertakings.

Morris, T. Species at Risk Research Biologist. Department of Fisheries and Oceans Canada, Great Lakes Laboratory for Fisheries and Aquatic Sciences. Personal communications, May to August 2006.

Moyle, J.B. and E.W. Moyle. 2001. Revised Edition: Northland Wildflowers: The Comprehensive Guide to the Minnesota Region. University of Minnesota Press. Minneapolis, Minnesota.

Natural Heritage Information Centre. 2006. – Rare Species by Jurisdiction: Township of Tecumseh, Municipality of Windsor, Municipality of LaSalle, Essex County. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. http://nhic.mnr.gov.on.ca/MNR/nhic/species/species\_query.cfm/.

Natural Heritage Information Centre. 2005. Ontario Odonata Atlas. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. http://www.mnr.gov.on.ca/MNR/nhic/odonates/ohs.html/.

Natural Heritage Information Centre. 2006. Species Lists. Natural Heritage Information Centre, Ministry of Natural Resources. http://nhic.mnr.gov.on.ca/species/species\_list.cfm/.

Natural Heritage Information Centre. 2002. Working Lists of Ontario Amphibians, Birds, Mammals, and Reptiles. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario.

Natural Heritage Information Centre. 1997. Southern Ontario Vegetation Communities List. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. http://www.mnr.gov.on.ca/MNR/nhic/communities/comm\_list.cfm/. Last revised January 1997.

Nelson, M. Biologist. Essex Region Conservation Authority, May to June 2006.

Newcomb, L. 1977. Newcomb's Wildflower Guide. Little Brown and Company. Toronto, Ontario.

Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario Plant List. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, Ontario, Forest Research Information Paper No. 123.

Newmaster, S.G., A.G. Harris and L.J. Kershaw. 1997. Wetland Plants of Ontario. Lone Pine Publishing and Queen's Printer. Edmonton, Alberta.

North American Butterfly Association. 2006. http://www.naba.org/.

Ojibway Nature Centre. 2006. Butterfly Count 1994 - 2004. Windsor, ON. http://www.ojibway.ca/naba.htm/.

Ojibway Nature Centre. 2006. Damselflies and Dragonflies of the Ojibway Prairie Complex. Windsor, ON. http://www.ojibway.ca/odonata.htm/.

Ojibway Nature Centre. 2006. Rare Vascular Plants & Wildlife in Ojibway. Rare, Threatened and Endangered Species of the Ojibway Prairie, Ontario. Ojibway Nature Centre, City of Windsor, Windsor, Ontario. http://www.ojibway.ca/raresp.htm/.

Ojibway Nature Centre. Butterfly Checklist for the Ojibway Park Area. Windsor, ON.

Oldham, M.J. and W.F. Weller. 2000. Ontario Herpetofaunal Atlas. Natural Heritage Information Centre, Ontario Ministry of Natural Resources.

Oldham, M.J. 1999. Natural Heritage Resources of Ontario: Rare Vascular Plants. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario.

Oldham, M. J. 1999. Presence of rare vascular plants in Essex County ESA sites. Natural Heritage Information Centre, Peterborough. Unpublished list. 9 pp.

Oldham, M. J. 1994. Spring Garden Road Plant List. Natural Heritage Information Centre, Peterborough. Unpublished list. 7 pp.

Oldham, M.J. 1993. Distribution and Status of the Vascular Plants of Southwestern Ontario. Ontario Ministry of Natural Resources. Aylmer District Office, Aylmer Ontario.

Oldham, M. J. 1983. Environmentally Significant Areas of the Essex Region. Essex Region Conservation Authority, Essex, Ontario. 426 pp.

Ontario Breeding Bird Atlas. 2006. www.birdsontario.org/atlas/atlasmain.html.

Ontario Butterfly Atlas Database. 2006. Database of Ontario butterfly records on file with the Toronto Entomologists' Association and the Natural Heritage Information Centre, Ontario Ministry of Natural Resources.

Ontario Ministry of Municipal Affairs and Housing (OMMAH). 2005. Provincial Policy Statement. Queen's Printer. Toronto, Ontario.

Ontario Ministry of the Environment and the Michigan Department of Natural Resources. 1996. 1996 Detroit River Remedial Action Plan Report. Sarnia, Ontario and Lansing, Michigan. 420 pp.

Ontario Ministry of the Environment and the Michigan Department of Natural Resources. 1991. Detroit River Remedial Action Plan. Stage 1. Sarnia, Ontario and Lansing, Michigan. June 3, 1991. 504 pp.

Ontario Ministry of Natural Resources. 2006. Natural Heritage Information Centre website http://www.mnr.gov.on.ca/MNR/nhic/nhic.cfm/. Ministry of Natural Resources, Peterborough, Ontario.

Ontario Ministry of Natural Resources. 2006. Committee on the Status of Species at Risk in Ontario (COSSARO). http://www.mnr.gov.on.ca/mnr/speciesatrisk/.

Ontario Ministry of Natural Resources. 2004a. Natural Resources and Values Information System. Digital data for the City of Windsor and the Towns of LaSalle, Tecumseh and Amherstburg. Provided to LGL Limited on April 4, 2005.

Ontario Ministry of Natural Resources. 2004b. Training Manual for Monitoring Forest Bird Responses to Silvicultural Treatments in the Carolinian zone. Version 2. Ontario Ministry of Natural Resources Southern Science and Information. London, Ontario.

Ontario Ministry of Natural Resources. 2002. Ojibway Prairie Park Management Plan. Ontario Ministry of Natural Resources, Chatham Area Office. 9 pp.

Ontario Ministry of Natural Resources. 1998. Natural Resources and Values Information System. Digital data for the City of Windsor and the Towns of LaSalle, Tecumseh and Amherstburg. Provided to LGL Limited on April 4, 2005.

Ontario Ministry of Natural Resources. 1997. Resource Management Plan for Ojibway Prairie Provincial Nature Reserve (Ontario Parks). Ontario Ministry of Natural Resources, Chatham Area Office. 26 pp. + maps.

Ontario Ministry of Natural Resources. 1993. A Review and Assessment of Prairie and Savannah in Site Regions 7 and 6 (Southern Region) Draft.

Ontario Parks. 2002. Ojibway Prairie Park Management Plan. Queens's Printer. Ontario, Canada.

Paiero, S. Entomologist. Department of Environmental Biology, University of Guelph. Personal communication, May to August 2006.

Paiero S.M. and S.A. Marshall. 2006. Database of Rare Heteroptera of Ontario - NHIC.

Paiero S.M. 2003. Autistic Study of the Insects in Ontario Tallgrass Prairies: Effects of Fire on an Ontario Tallgrass Prairie Insect Community and Evidence for the Prairie Peninsula Hypothesis. Thesis Presented to the Faculty Graduate Studies of the University of Guelph.

Paiero, S.M. and M. Buck. 2003. The Giant Resin Bee, Megachilie Sculpturalis Smith, and Other Newly Introduced and Newly Recorded Native Megachilidae and Andrenidae (Apoidea) from Ontario. Journal of the Entomological Society of Ontario. 134: 141-143.

Paiero, S.M. and S.A. Marshall. 2003. New Records of Hemiptera from Canada and Ontario. Journal of the Entomological Society of Ontario. 134:115-129.

Parker, B. and J. Dawson. 1984. Wetland Data Record and Evaluation – Canard River. Second Edition. Ontario Ministry of Natural Resources. 1984. Manuscript. 12 pp. + 2 pp. supplement.

Pedlar, J. 1991. A Review of Herpetofaunal Sampling Techniques. Applicable to Grey and Bruce Counties. Ontario Ministry of Natural Resources. Owen Sound.

Peterson, R.P. and M. McKenny. 1996. Peterson Field Guides: Wildflowers Northeastern/North-central North America. Sponsored by the National Audubon Society, the National Wildlife Federation and the Roger Tory Peterson Institute. Houghton Mifflin Company. New York, New York.

Pratt, P.D. Ecologist at Ojibway Nature Centre, City of Windsor. Personal communication, February & March 2007.

Pratt, P.D. Ecologist at Ojibway Nature Centre, City of Windsor. Personal communication, May to December 2006.

Pratt, P. D. 1979. A preliminary life science inventory of the Ojibway Prairie Complex and surrounding area. Unpublished report prepared for the City of Windsor and the OMNR. 163 pp.

Ralph, C.J. and M. Scott. 1981. Studies in Avian Biology No. 6. A Publication of the Cooper Ornithological Society. Lawrence, Kansas.

Ralph, C.J., J.R. Sauer and S. Droege. 1995. Monitoring Bird Populations by Point Counts. Pacific Southwest Research Station, Albany, California.

Reichman, O. 1988. Konza Prairie: A Tallgrass Natural History. University of Kansas press.

Rezendes, P. 1999. Tracking and the Art of Seeing. HarperCollins Publishers Inc., New York.

Richardson, G. Toronto Entomologists Association. Personal communication, May 2006.

Robertson, K. http://www.inhs.uiuc.edu/~kenr/prairierestoration.html/. Plant systematist for the Illinois Natural History Survey.

Royer, F. and R. Dickinson. 1999. A Guide for Identification: Weeds of Canada and the Northern United States. The University of Alberta Press. Lone Pine Publishing. Edmonton, Alberta.

Schramm, P. 1990. Prairie restoration: a twenty-five year perspective on establishment and management. IN Proceedings of the Twelfth North American Prairie Conference, ed. D.D. Smith and C.A. Jacobs, 169-177. Cedar Falls, IA: University of Northern Iowa.

Semple, J.C., S.B. Heard and L. Brouillet. 2002. Cultivated and Native Asters of Ontario (Compositae: Asteraceae). University of Waterloo Biology Series. Department of Biology, University of Waterloo, Waterloo, Ontario.

Shirley, S. 1994. Restoring the Tallgrass Prairie: An Illustrated Manual for Iowa and the Upper Midwest. University of Iowa Press: Iowa City.

Sibley, D.A. 2003. The Sibley Field Guide to the Birds of Eastern North America. Alfred A. Knopf, Inc., Inc. New York.

Significant Wildlife Habitat Technical Guide. 2000. Fish and Wildlife Branch. Ontario Ministry of Natural Resources.

Simpson, H. Area Biologist. Ministry of Natural Resources, Chatham. Personal communication, May 19, 2006.

Sluis, W.J. 2002. Patterns of Species Richness and Composition in re-created grassland. Restoration Ecology. 10:677.

Smith, N. Impact Assessment Biologist. Department of Fisheries and Oceans Canada, Sarnia District. Personal communication, April 2006.

Soper, J.H. and M.L. Heimburger. 1982. Shrubs of Ontario. The Royal Ontario Museum. Toronto, Ontario.

Steigman, K. and L. Ovenden. 1988. Transplanting Tallgrass Prairie with a sodcutter. Proceedings of the 10th Annual North American Prairie Conference. The prairie: roots of our culture; foundation of our economy: Texas Women's University, Denton, Texas, June 22-26, 1986.

Sutherland, D. Natural Heritage Zoologist. Ministry of Natural Resources, Natural Heritage Centre. Personal Communications, June 2006 to January 2007.

Swink, F. 1990. To the Vascular Flora of the Northeastern United States and Southeastern Canada. John J. Sabuco & Plantsmen's Publications.

Tallgrass Ontario. 2007. http://www.tallgrassontario.org/.

Town of LaSalle. 2003. Town of LaSalle Official Plan. Prepared by Prince, Silani and Associates Limited. Office Consolidation: November 4, 2003.

Town of LaSalle. 1996. Candidate Natural Heritage Area Biological Inventory and Land Use Planning Policy Direction Discussion Paper No. 1. Prepared by Prince, Silani and Associates Limited. April 1996. 103 pp.

Town of Tecumseh. 2004. St. Clair Beach Official Plan. Prepared by the Town of Tecumseh. Office Consolidation: April 2004.

Town of Tecumseh. 2003. Sandwich South Official Plan. Prepared by the Town of Tecumseh. Office Consolidation: July 2003.

Town of Tecumseh. 2000. Tecumseh Official Plan. Prepared by the Town of Tecumseh. Office Consolidation: January 2000.

Trelease, W. 1931. Winter Botany. An Identification Guide to Native Trees and Shrubs. Third Revised Edition. Dover Publications, Inc., Mineola, New York.

University of Guelph. 2005. Insect Collection: The Insects of Ojibway Prairie. Windsor, ON. http://www.uoguelph.ca/debu/Ojibway.htm/.

URS Canada Inc. 2005. Canada - United States - Ontario - Michigan Border Transportation Partnership Planning/Need and Feasibility Study: Environmental Overview Report (Amended). Prepared by URS Canada Inc. January, 2005.

Van Dyke, F., S.E.Van Kley, C.E. Page, and J.G. VanBeek. 2004. Burning and Mowing in Tallgrass Prairies. Restoration Ecology. Vol 12 (4): 575-585.

Voss, E.G. 2001. Michigan Flora. A Guide to the Identification and Occurrence of the Naturalized Seed-plants of the State. Part I Gymnosperms and Monocots. Cranbrook Institute of Science Bulletin 55 and University of Michigan Herbarium 1972. Edwards Brothers, Inc.

Voss, E.G. 2001. Michigan Flora. A Guide to the Identification and Occurrence of the Naturalized Seed-plants of the State. Volume 2 Dicots (Saururaceae - Cornaceae). Cranbrook Institute of Science Bulletin 59 and University of Michigan Herbarium 1985. Edwards Brothers, Inc.

Voss, E.G. 1996. Michigan Flora. A Guide to the Identification and Occurrence of the Naturalized Seed-plants of the State. Volume 3 Dicots (Pyrolaceae - Compositae). Cranbrook Institute of Science Bulletin 61 and University of Michigan Herbarium 1996. Edwards Brothers, Inc.

Waldron G. 2003. Trees of the Carolinian Forest: A Guide to Species, Their Ecology and Uses. Boston Mills Press, Erin, Ontario.

Wallis. J.B. 1961. The Cicindelidae of Canada. University of Toronto Press. Toronto. Ontario.

Walters, C. 1997. Challenges in adaptive management of riparian and coastal ecosystems. Conservation Ecology [online] 1(2):1. Available from the Internet. URL: http://www.consecol.org/vol1/iss2/art1/.

Wickett, R.G., P.D. Lewis, A. Woodliffe and P. Pratt. 1992. Thirteenth North American Prairie Conference Proceedings: Spirit of the Land, Our Prairie Legacy. Department of Parks and Recreation, Windsor, Ontario. Preney Print and Litho Inc.

Wilson, D.E., F.R. Cole, J.D. Nichols, R. Rudran and M.S. Foster. 1996. Measuring and Monitoring Biological Diversity. Standard Methods for Mammals. Smithsonian Institution Press, Washington and London.

Wood, S. 2004. The use of Benthic Macroinvertebrate Community Composition as a Measure of Contaminant Induced Stress in the Sediments of the Detroit River. University of Windsor. Windsor, ON.

Woodliffe, P.A. 1997. Resource Management Plan for Ojibway Prairie Provincial Nature Reserve (Ontario Parks). Ontario Ministry of Natural Resources Chatham Area.

Woodliffe, P. A. 1994. Spring Garden Road Prairie. OMNR, Chatham. Unpublished letter. 3 pp. + map.

Wormington, A. and D. Fraser. 1985a. Wetland Data Record and Evaluation - Detroit River Marshes. Second Edition. August 1985. Ontario Ministry of Natural Resources. Manuscript. 22 p + 15 maps + 27 pp supplement.

Wormington, A. and D. Fraser. 1985b. Wetland Data Record and Evaluation – Fighting Island. Second Edition. August 1985. Ontario Ministry of Natural Resources. Manuscript. 22 pp. + 1 map + 6 pp. supplement.

Wormington, A. and D. Fraser. 1985c. Wetland Data Record and Evaluation – Turkey Creek. Second Edition. August 1985. Ontario Ministry of Natural Resources, Chatham. Manuscript. 22 pp. + 2 maps + 3 pp. supplement.

APPENDICES



### APPENDIX A ACRONYMS AND DEFINITIONS USED IN SPECIES LISTS

**Species Status** 

COSEWIC	Committee On The Status Of Endangered Wildlife In Canada
The Committee on the Statu	is of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species that
are considered to be at risk i	n Canada.

Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

# COSSARO/OMNR Committee On The Status Of Species At Risk In Ontario/Ontario Ministry Of Natural Resources

The Committee on the Status of Species at Risk in Ontario (COSSARO)/Ontario Ministry of Natural Resources (OMNR) assesses the provincial status of wild species that are considered to be at risk in Ontario.

Extinct (EXT)	A species that no longer exists anywhere.
Extirpated (EXP)	A species that no longer exists in the wild in Ontario but still occurs elsewhere.
Endangered (Regulated) (END-R)	A species facing imminent extinction or extirpation in Ontario which has be regulated under Ontario's <i>Endangered Species Act</i> .
Endangered (END)	A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's <i>Endangered Species Act</i> .
Threatened (THR)	A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
Special Concern (SC)	A species with characteristics that make it sensitive to human activities or natural events.
Not at Risk (NAR)	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)	A species for which there is insufficient information for a provincial status recommendation.

#### Species Rank

#### GRANK Global Rank

Global ranks are assigned by a consensus of the network of Conservation Data Centres, scientific experts, and The Nature Conservatory to designate a rarity rank based on the range-wide status of a species, subspecies or variety.

The most important factors considered in assigning global ranks are the total number of known, extant sites world-wide, and the degree to which they are potentially or actively threatened with destruction. Other criteria include the number of known populations considered to be securely protected, the size of the various populations, and the ability of the taxon to persist at its known sites. The taxonomic distinctness of each taxon has also been considered. Hybrids, introduced species, and taxonomically dubious species, subspecies and varieties have not been included.

- G1 **Extremely rare**; usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2 Very rare; usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
- G3 Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- G4 Common; usually more than 100 occurrences; usually not susceptible to immediate threats.
- G5 Very common; demonstrably secure under present conditions.
- GH Historic, no records in the past 20 years.
- GU Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.
- GX Globally extinct. No recent records despite specific searches.
- ? Denotes inexact numeric rank (i.e. G4?).
- G A "G" (or "T") followed by a blank space means that the NHIC has not yet obtained the Global Rank from The Nature Conservancy.
- G? Unranked, or, if following a ranking, rank tentatively assigned (e.g. G3?).
- Q Denotes that the taxonomic status of the species, subspecies, or variety is questionable.
- T Denotes that the rank applies to a subspecies or variety.

#### SRANK Provincial Rank

Provincial (or Sub-national) ranks are used by the Ontario Ministry of Natural Resources Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC evaluates provincial ranks on a continual basis and produces updated lists at least annually.

- S1 **Critically imperiled** in Ontario because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation.
- S2 **Imperiled** in Ontario because of rarity due to very restricted range, very few populations (often 20 or fewer occurrences) steep declines or other factors making it very vulnerable to extirpation.
- S3 **Vulnerable** in Ontario due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 Secure—Common, widespread, and abundant in Ontario.
- SX Presumed Extirpated Species or community is believed to be extirpated from Ontario.
- SH **Possibly Extirpated** Species or community occurred historically in Ontario and there is some possibility that it may be rediscovered.
- SNR Unranked—Conservation status in Ontario not yet assessed
- SU **Unrankable**—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- SNA **Not Applicable** —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
- S#S# **Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

#### Species Regulated by Statute

#### SARA Species at Risk Act

The Canada *Species at Risk Act* provides a framework for actions across Canada to ensure the survival of wildlife species and the protection of our natural heritage. It sets out how to decide which species are a priority for action and what to do to protect a species. It identifies ways governments, organizations and individuals can work together, and it establishes penalties for a failure to obey the law. Regulated species are listed in Schedules 1, 2 and 3 of the Act.

Schedule 1 SARA (1)	Species that are currently covered under the Act.
Schedule 2 SARA (2)	Species that are endangered or threatened that have not been re-assessed by COSEWIC for inclusion on Schedule 1.
Schedule 3 SARA (3)	Species that are of special concern that have not yet been re-assessed by COSEWIC for inclusion on Schedule 1.

### OESA Endangered Species Act

The new Ontario *Endangered Species Act* (2007) will provide for the conservation, protection, restoration and propagation of fauna and flora of the Province of Ontario that are threatened with extinction, extirpated, endangered, threatened or of special concern. Regulated species are listed in Schedules 1, 2, 3, 4 and 5 of the Act.

Schedule 1 Species declared to the threatened with Extinction in Regulation 328 fo the revised regulations of Ontario, 1990.

Schedule 2 OESA (2)	Species to be listed as Extirpated species.
Schedule 3 OESA (3)	Species to be listed as Endangered species.
Schedule 4 OESA (4)	Species to be listed as Threatened species.
Schedule 5 OESA (5)	Species to be listed as Special Concern species.

### FWCA Fish and Wildlife Conservation Act

The Ontario *Fish and Wildlife Conservation Act* enables the Ministry of Natural Resources to protect and manage a broad range of fish and wildlife species. Regulated fish and wildlife are listed as furbearing (F), game (G) or protected (P) in schedules to the Act.

FWCA (F) Furbearing mammals (Schedule 1).

FWCA (G) Game mammals (Schedule 2), birds (Schedule 3), reptiles (Schedule 4) and amphibians (Schedule 5)

FWCA (SP) Specially protected mammals (Schedule 6), birds (raptors) (Schedule 7), birds (other than raptors) (Schedule 8), reptiles (Schedule 9), amphibians (Schedule 10) and invertebrates (Schedule 11).

### MBCA Migratory Birds Convention Act

The Canada *Migratory Birds Convention Act* implements the Convention by protecting and conserving migratory birds — as populations and individual birds — and their nests. Article 1 identifies the migratory game birds, migratory insectivorous birds and other migratory non-game birds regulated by the Act.

### FA Fisheries Act

The Canada *Fisheries Act* enables the Department of Fisheries and Oceans to protect and manage fish and fish habitat. Fish includes: parts of fish; shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals; and, the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.

### PA Planning Act

The Ontario *Planning Act* legislates land use planning and development within the province. The *Provincial Policy Statement* is issued under the authority of Section 3 of the *Planning Act*. It provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial "policy-led" planning system. The PPS enables the Province to protect significant natural heritage features and areas including the significant habitat of endangered and threatened species.

APPENDIX B

APPENDIX B	
LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF IN	VESTIGATION

Scientific Name		Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	EQUISETACEAE	HORSETAIL FAMILY						
	Equisetum arvense	field horsetail			G5	S5	С	
	Equisetum hyemale ssp. affine	scouring-rush			G5T5	S5	С	
	Equisetum laevigatum	smooth scouring-rush			G5	S4	VU	
	Equisetum pratense	meadow horsetail			G5	S5	?	
	<i>Equisetum variegatum</i> ssp. <i>variegatum</i>	variegated horsetail			G5T	S5	R2	
	OPHIOGLOSSACEAE	ADDER'S TONGUE FAMILY						
	Botrychium dissectum	cut-leaved grape fern			G5	S5	С	
	OSMUNDACEAE	ROYAL FERN FAMILY						
	Osmunda claytoniana	interrupted fern			G5	S5	U	
	<i>Osmunda regalis</i> var. <i>spectabilis</i>	royal fern			G5T5	S5	U	
	DENNSTAEDTIACEAE	BRACKEN FERN FAMILY						
	Pteridium aquilinum var. Iatiusculum	eastern bracken-fern			G5T5	S5	U	
	THELYPTERIDACEAE	MARSH FERN						
	Thelypteris noveboracensis	New York fern			G5	S4S 5	R5	
	Thelypteris palustris var. pubescens	marsh fern			G5T5	S5	С	
	DRYOPTERIDACEAE	WOOD FERN FAMILY						
	Athyrium filix-femina var. angustum	northern lady fern			G5T5	S5	С	
	Dryopteris carthusiana	spinulose wood fern			G5	S5	С	
	Matteuccia struthiopteris var. pensylvanica	ostrich fern			G5T5	S5	R3	
	Onoclea sensibilis	sensitive fern			G5	S5	С	
	PINACEAE	PINE FAMILY						
*	Picea abies	Norway spruce			G?	SE3	?	
	Picea glauca	white spruce			G5	S5	?	
*	Picea pungens	Colorado spruce			G5	SE1	?	
*	Pinus nigra	Austrian pine			G?	SE2	?	
	Pinus strobus	eastern white pine			G5	S5	R1	
*	Pinus sylvestris	scotch pine			G?	SE5	?	
	CUPRESSACEAE	CEDAR FAMILY						
	Juniperus communis	common juniper			G5	S5	R4	
	Juniperus virginiana	eastern red cedar			G5	S5	С	
	Thuja occidentalis	eastern white cedar			G5	S5	?	
	TAXACEAE	YEW FAMILY						

	<b>A</b> PPENDIX <b>B</b>	
LIST OF VASCULAR	PLANTS LOCATED IN THE ARE	EA OF INVESTIGATION

Scientific Name		Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
* Taxus cuspidata		Japanese yew				SE	?	
MAGNOLIACEAE		MAGNOLIA FAMILY						
* Magnolia soulangeana		saucer magnolia				SE	?	
LAURACEAE		LAUREL FAMILY						
Sassafras albidum		sassafras			G5	S4	С	
RANUNCULACEAE		BUTTERCUP FAMILY						
Actaea pachypoda		white baneberry			G5	S5	С	
Anemone americana		round-lobed hepatica			G?	S5	R5	
Anemone canadensis		Canada anemone			G5	S5	С	
Anemone cylindrica		thimbleweed			G5	S4	VU	
Anemone quinquefolia quinquefolia	var.	wood anemone			G5	S5	С	
Anemone virginiana virginiana	var.	thimbleweed			G5T5	S5	С	
Aquilegia canadensis		wild columbine			G5	S5	С	
Ranunculus abortivus		kidney-leaf buttercup			G5	S5	С	
* Ranunculus acris		tall buttercup			G5	SE5	lvu	
Ranunculus hispidus caricetorum	var.	swamp buttercup			G5T5	S5	С	
Ranunculus recurvatus recurvatus	var.	hooked buttercup			G5	S5	VU	
Ranunculus sceleratus sceleratus	var.	cursed buttercup			G5T5	SU	С	
Thalictrum dasycarpum		purple meadow-rue			G5	S4?	С	
Thalictrum dioicum		early meadow-rue			G5	S5	С	
Thalictrum pubescens		tall meadow-rue			G5	S5	?	
Thalictrum revolutum		waxy meadow-rue			G5	S2	R2	
BERBERIDACEAE		BARBERRY FAMILY						
* Berberis thunbergii		Japanese barberry			G?	SE5	lu	
* Berberis vulgaris		common barberry			G?	SE5	?	
Podophyllum peltatum		may-apple			G5	S5	С	
MENISPERMACEAE		MOONSEED FAMILY						
Menispermum canadense		moonseed			G5	S4	С	
PAPAVERACEAE		POPPY FAMILY						
* Chelidonium majus		celandine			G?	SE5	lr	
PLATANACEAÉ		PLANE-TREE FAMILY						
Platanus occidentalis		sycamore			G5	S4	С	
HAMAMELIDACEAE		WITCH-HAZEL FAMILY						
Hamamelis virginiana		witch-hazel			G5	S5	С	
ULMACEAE		ELM FAMILY						

	APPENDIX B
L	IST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Celtis occidentalis	common hackberry			G5	S4	С	
	Ulmus americana	white elm			G5?	S5	С	
*	Ulmus glabra	Scotch elm			G?	SE1	?	
*	Ulmus pumila	Siberian elm			G?	SE3	lvu	
	Ulmus rubra	slippery elm			G5	S5	С	
	MORACEAE	MULBERRY FAMILY						
*	Morus alba	white mulberry			G?	SE5	Ic	
	URTICACEAE	NETTLE FAMILY						
	Boehmeria cylindrica	false nettle			G5	S5	С	
	Pilea pumila	dwarf clearweed			G5	S5	С	
*	Urtica dioica ssp. dioica	European stinging nettle			G5T?	SE2	?	
	JUGLANDACEAE	WALNUT FAMILY						
	Carya cordiformis	bitternut hickory			G5	S5	С	
	Carya glabra	pignut hickory			G5	S3	VU	
	Carya laciniosa	big shellbark hickory			G5	S3	С	
	<i>Carya ovata</i> var. <i>ovata</i>	shagbark hickory			G5	S5	С	
	Juglans cinerea	butternut	END	END	G3G4	S3?	С	SARA (1), OESA (3), PA
	Juglans nigra	black walnut			G5	S4	С	
*	Juglans regia	English walnut			G?	SE1	?	
	FĂGACEĂE	BEECH FAMILY						
	Quercus alba	white oak			G5	S5	С	
	Quercus bicolor	swamp white oak			G5	S4	С	
	Quercus macrocarpa	bur oak			G5	S5	С	
	Quercus palustris	pin oak			G5	S3	С	
	Quercus rubra	red oak			G5	S5	С	
	Quercus shumardii	shumard oak	SC	SC	G5	S3	U	SARA (3), OESA (5)
	Quercus velutina	black oak			G5	S4	С	<u>\-/</u>
	BETULACEAE	BIRCH FAMILY						
	Betula papyrifera	white birch			G5	S5	lr	
*	Betula pendula	European weeping birch			G?	SE4	?	
	Carpinus caroliniana ssp. virginiana	blue beech			G5T	S5	С	
	Corylus americana	American hazel			G5	S5	С	
	Corylus cornuta ssp. cornuta	beaked hazel			G5T	S5	?	
	Ostrya virginiana	ironwood			G5	S5	С	
	PHYTOLACCACEAE	POKEWEED FAMILY						
	Phytolacca americana	pokeweed			G5	S4	С	

	APPENDIX B	
LIST OF VASCULAR	R PLANTS LOCATED IN THE AREA OF INVESTIGATIO	N

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	NYCTAGINACEAE	FOUR-O-CLOCK FAMILY						
	Mirabilis nyctaginea	wild four-o'clock			G5	S4	lc	
	CHENOPODIACEAE	GOOSEFOOT FAMILY						
*	<i>Chenopodium album</i> var. <i>album</i>	lamb's quarters			G5T5	SE5	lc	
*	Salsola kali	Russian thistle			G?	SE1	lc	
	Suaeda calceoliformis	western seablite			G5	S2	?	
	CARYOPHYLLACEAE	PINK FAMILY						
*	Cerastium semidecandrum	small chickweed			G?	SE5	lr	
*	Dianthus armeria	deptford pink			G?	SE5	lc	
*	Lychnis coronaria	mullein pink			G?	SE3	?	
*	Saponaria officinalis	bouncing-bet			G?	SE5	lc	
*	Silene latifolia	bladder campion			G?	SE5	lu	
*	Stellaria media	common chickweed			G?	SE5	lc	
	POLYGONACEAE	SMARTWEED FAMILY						
*	Polygonum convolvulus	black bindweed			G?	SE5	lc	
*	Polygonum cuspidatum	Japanese knotweed			G?	SE4	lr	
*	Polygonum hydropiper	water-pepper			G5	SE5	С	
	Polygonum lapathifolium	pale smartweed			G5	S5	С	
	Polygonum pensylvanicum	Pennsylvania smartweed			G5	S5	С	
*	Polygonum persicaria	lady's-thumb			G?	SE5	lc	
	Polygonum punctatum	water smartweed			G5	S5	С	
	Polygonum virginianum	Virginia knotweed			G5	S4	С	
*	<i>Rumex acetosella</i> ssp. <i>acetosella</i>	sheep sorrel			G5T	SE	lc	
*	Rumex crispus	curly-leaf dock			G?	SE5	lc	
	GUTTIFERAE	ST. JOHN'S-WORT FAMILY						
*	Hypericum perforatum	common St. John's-wort			G?	SE5	lc	
	Hypericum punctatum	corymbed St. John's-wort			G5	S5	С	
	TILIACEAE	LINDEN FAMILY						
	Tilia americana	American basswood			G5	S5	С	
	MALVACEAE	MALLOW FAMILY						
*	Abutilon theophrasti	velvet-leaf			G?	SE5	lc	
*	Hibiscus syriacus	Rose-of-Shraon					lr	
*	Hibiscus trionum	flower-of-an-hour			G?	SE4	lu	
*	Malva neglecta	cheeses			G?	SE5	lr	
	VIOLACEAE	VIOLET FAMILY						
	Viola blanda	sweet white violet			G4G5	S4S 5	R2	
	Viola pubescens	downy yellow violet			G5	S5	С	

APPENDIX B
LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
<i>Viola sagittata</i> var. <i>sagittata</i>	arrow-leaved violet			G5T5	S4	R4	
Viola sororia	woolly blue violet			G5	S5	С	
SALICACEAE	WILLOW FAMILY						
* Populus alba	silver poplar			G5	SE5	lr	
Populus balsamifera ssp. balsamifera	balsam poplar			G5T5	S5	R2	
Populus deltoides ssp. deltoides	eastern cottonwood			G5T5	SU	С	
Populus grandidentata	large-tooth aspen			G5	S5	U	
Populus tremuloides	trembling aspen			G5	S5	С	
* Salix alba	white willow			G5	SE4	lr	
Salix amygdaloides	peach-leaved willow			G5	S5	С	
Salix bebbiana	long-beaked willow			G5	S5	VU	
Salix discolor	pussy willow			G5	S5	С	
Salix eriocephala	Missouri willow			G5	S5	С	
Salix exigua	sandbar willow			G5	S5	С	
Salix humilis	prairie willow			G5	S5	R4	
Salix lucida	shining willow			G5	S5	R1	
* Salix matsudana	corkscrew willow					lr	
Salix nigra	black willow			G5	S4?	U	
Salix petiolaris	slender willow			G5	S5	R1	
* Salix X rubens	hybrid crack willow			HYB	SE4	lr	
* Salix X sepulcralis	weeping willow			HYB	SE2	?	
BRASSICACEAE	MUSTARD FAMILY						
* Alliaria petiolata	garlic mustard			G5	SE5	lc	
* Barbarea vulgaris	yellow rocket			G?	SE5	lc	
* Berteroa incana	hoary alyssum			G?	SE5	lu	
* Brassica nigra	black mustard			G?	SE5	?	
* Capsella bursa-pastoris	shepherd's purse			G?	SE5	lc	
Cardamine douglassii	purple cress			G5	S4	С	
* Erysimum cheiranthoides ssp. cheiranthoides	wormseed mustard				SE5	lc	
* Hesperis matronalis	dame's rocket			G4G5	SE5	lu	
* Lepidium campestre	field cress			G?	SE5	lc	
* Rorippa sylvestris	creeping yellow-cress	1		G5	SE5	lvu	
* Sisymbrium altissimum	tall tumble-mustard	1		G?	SE5	lvu	
* Thlaspi arvense	field penny-cress	1		G?	SE5	lc	
ERICACEAE	HEATH FAMILY						
Vaccinium pallidum	pale blueberry			G5	S4	С	
APPENDIX B							
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LIST OF VASCULAR PLANTS LOCATED IN THE AREA	OF INVESTIGATION						

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	PYROLACEAE	WINTERGREEN FAMILY						
	Pyrola elliptica	shinleaf			G5	S5	R3	
	PRIMULACEAE	PRIMROSE FAMILY						
	Lysimachia ciliata	fringed loosestrife			G5	S5	С	
*	Lysimachia nummularia	moneywort			G?	SE5	lc	
	Lysimachia quadriflora	four-flowered loosestrife			G5?	S4	R4	
	Lysimachia quadrifolia	whorled loosestrife			G5	S4	R4	
	GROSSULARIACEAE	GOOSEBERRY FAMILY						
	Ribes americanum	wild black currant			G5	S5	С	
	Ribes cynosbati	prickly gooseberry			G5	S5	С	
	Ribes hirtellum	smooth gooseberry			G5	S5	R3	
*	Ribes rubrum	red currant			G4G5	SE5	?	
	SAXIFRAGACEAE	SAXIFRAGE FAMILY						
	Penthorum sedoides	ditch stonecrop			G5	S5	С	
	ROSACEAE	ROSE FAMILY						
	Agrimonia gryposepala	tall hairy agrimony			G5	S5	С	
	Agrimonia parviflora	many-flowered agrimony			G5	S3	С	
	Amelanchier arborea	downy juneberry			G5	S5	U	
	Amelanchier laevis	smooth juneberry			G4G5 Q	S5	VU	
	Aronia melanocarpa	black chokeberry			G5	S5	U	
	Crataegus crus-galli	cockspur thorn			G5	S5	С	
	Crataegus mollis	downy thorn			G5	S5	R1	
*	Crataegus monogyna	English hawthorn			G5	SE5	lr	
	Crataegus punctata	large-fruited thorn			G5	S5	С	
	Fragaria virginiana ssp. virginiana	scarlet strawberry			G5T5	SU	С	
	Geum aleppicum	yellow avens	1		G5T5	S5	R3	
	Geum canadense	white avens			G5	S5	С	
	Geum vernum	spring avens			G5	S3	С	
*	Malus baccata	Siberian crabapple			G?	SE1	?	
	Malus coronaria	narrow-leaved crabapple	1		G5	S4	С	
*	Malus pumila	common crabapple			G5	SE5	lr	
	Physocarpus opulifolius	ninebark			G5	S5	R2	
	Potentilla anserina ssp. anserina	silverweed				S5	С	
	Potentilla canadensis	common cinquefoil	1		G5	SU	?	
	Potentilla norvegica ssp.	cinquefoil			G5T?	SU	lc	
*	Potentilla recta	rough-fruited cinquefoil	1		G?	SE5	lc	

	<b>A</b> PPENDIX <b>B</b>	
LIST OF VASCULAR	PLANTS LOCATED IN THE ARE	EA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Potentilla simplex	old-field cinquefoil			G5	S5	С	
*	Prunus avium	sweet cherry			G?	SE4	lr	
*	Prunus cerasus	sour cherry			G?	SE1	lr	
	Prunus pensylvanica	pin cherry			G5	S5	R1	
	Prunus serotina	black cherry			G5	S5	С	
	<i>Prunus virginiana</i> ssp. <i>virginiana</i>	choke cherry			G5T5	S5	С	
*	Prunus virginiana var. Schubert	Schubert Chokecherry					?	
*	Pyrus communis	common pear			G5	SE4	lr	
	<i>Rosa acicularis</i> ssp. <i>sayi</i>	prickly rose			G5T5	S5	?	
	Rosa blanda	smooth rose			G5	S5	С	
	Rosa carolina	swamp rose			G5	S4	С	
*	Rosa multiflora	multiflora rose			G?	SE4	Ic	
	Rosa palustris	marsh rose			G5	S5	С	
*	Rosa rubiginosa	sweetbrier rose				SE4	lu	
	Rosa setigera	prairie rose	SC	SC	G5	S3	С	SARA (1), OESA (5)
	Rubus allegheniensis	common blackberry			G5	S5	С	
	Rubus canadensis	smooth blackberry			G5	S4?	?	
	Rubus flagellaris	prickly raspberry			G5	S4	С	
	Rubus hispidus	trailing blackberry			G5	S4S 5	С	
	<i>Rubus idaeus</i> ssp. <i>melanolasius</i>	wild red raspberry			G5T5	S5	С	
	Rubus occidentalis	thimble-berry			G5	S5	С	
*	Sorbaria sorbifolia	false spiraea			G5	SE4	?	
*	Sorbus aucuparia	European mountain-ash			G5	SE4	lr	
	Spiraea alba	narrow-leaved meadow-sweet			G5	S5	С	
*	Spiraea prunifolia	bridal-wreath spiraea			G5	SE1	?	
	Spiraea tomentosa	tomentose meadow-sweet			G5	S4S 5	R4	
	FABACEAE	PEA FAMILY						
	Amphicarpaea bracteata	hog peanut			G5	S5	С	
	Apios americana	groundnut			G5	S5	С	
	Baptisia tinctoria	wild indigo			G5	S2	R5	
*	Caragana arborescens	Siberian pea tree			G?	SE1	?	
	Cercis canadensis	Canadian redbud			G5	SX	Rh	
*	Coronilla varia	variable crown-vetch			G?	SE5	lu	
	Desmodium canadense	Canadian tick-trefoil			G5	S4	С	
	Desmodium glutinosum	pointed-leaved tick-trefoil			G5	S4	U	

Appendix B	
LIST OF VASCULAR PLANTS LOCATED IN THE ARE	EA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Gleditsia triacanthos	honey locust			G5	S2	U	
	Gymnocladus dioicus	Kentucky coffee-tree	THR	THR	G5	S2	VU	SARA (1), OESA (4), PA
*	Lathyrus latifolius	everlasting pea			G?	SE4	lvu	
	Lathyrus ochroleucus	cream-coloured vetchling			G4G5	S4	R1	
	Lathyrus palustris	marsh vetchling			G5	S5	U	
*	Lathyrus tuberosus	tuberous vetchling			G?	SE3	lr	
	Lespedeza capitata	round-headed bush-clover			G5	S4	R3	
*	Lotus corniculatus	bird's-foot trefoil			G?	SE5	Ic	
*	Medicago lupulina	black medick			G?	SE5	Ic	
*	Medicago sativa ssp. sativa	alfalfa			G?T?	SE5	lvu	
*	Melilotus alba	white sweet-clover			G?	SE5	lc	
*	Melilotus officinalis	yellow sweet-clover			G?	SE5	lc	
*	Robinia pseudo-acacia	black locust			G5	SE5	lu	
*	Trifolium aureum	yellow clover			G?	SE5	lr	
*	Trifolium hybridum ssp. elegans	alsike clover				SE5	lr	
*	Trifolium pratense	red clover			G?	SE5	lu	
*	Trifolium repens	white clover			G?	SE5	lu	
*	Vicia cracca	tufted vetch			G?	SE5	lr	
	ELAEAGNACEAE	OLEASTER FAMILY						
*	Elaeagnus angustifolia	Russian olive			G?	SE3	lr	
*	Elaeagnus umbellata	Russian olive			G?	SE3	lr	
	LYTHRACEAE	LOOSESTRIFE FAMILY						
	Lythrum alatum	wing-angled loosestrife			G5	S3	С	
*	Lythrum salicaria	purple loosestrife			G5	SE5	lc	
	ONAGRACEAE	EVENING-PRIMROSE FAMILY						
	<i>Circaea lutetiana</i> ssp. <i>canadensis</i>	yellowish enchanter's nightshade			G5T5	S5	С	
	<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	ciliate willow-herb			G5T?	S5	R1	
*	Epilobium hirsutum	great hairy willow-herb			G?	SE5	lc	
	Gaura biennis	biennial gaura			G5	S2	U	
	Ludwigia alternifolia	rattle-box			G5	S1	R3	
	Ludwigia polycarpa	many-fruited false loosestrife			G4	S2	U	
	Oenothera biennis	common evening-primrose			G5	S5	С	
	Oenothera perennis	perennial evening-primrose			G5	S4S 5	R1	
	CORNACEAE	DOGWOOD FAMILY				-		
	Cornus amomum ssp. obliqua	silky dogwood			G5T?	S5	С	
	Cornus drummondii	Drummond's dogwood	1		G5	S4	С	

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	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	<i>Cornus foemina</i> ssp. <i>racemosa</i>	gray dogwood			G5T5?	S5	С	
	Cornus rugosa	round-leaved dogwood			G5	S5	?	
	Cornus stolonifera	red-osier dogwood			G5	S5	С	
	NYSSACEAE	SOUR GUM FAMILY						
	Nyssa sylvatica	black gum			G5	S3	U	
	SANTALACEAE	SANDALWOOD FAMILY						
	Comandra umbellata	bastard toad-flax			G5	S5	С	
	CELASTRACEAE	STAFF-TREE FAMILY						
*	Celastrus orbiculatus	Oriental bittersweet			G?	SE2	?	
	Celastrus scandens	climbing bittersweet			G5	S5	С	
*	Euonymus alata	winged spindle tree			G?	SE2	lr	
*	Euonymus europaea	spindle tree			G?	SE2	lr	
	Euonymus obovata	running strawberry-bush			G5	S5	С	
	EUPHORBIACEAE	SPURGE FAMILY						
	Acalypha virginica var. rhomboidea	three-seeded mercury			G5T5	S5	С	
*	Chamaesyce maculata	spotted spurge			G5?	SE5	Ic	
	Euphorbia corollata	flowering spurge			G5	S4	VU	
	RHAMNACEAE	BUCKTHORN FAMILY						
*	Rhamnus cathartica	common buckthorn			G?	SE5	lvu	
*	Rhamnus frangula	glossy buckthorn			G?	SE5	lr	
	VITACEAE	GRAPE FAMILY						
	Parthenocissus inserta	inserted Virginia-creeper			G5	S5	С	
	Parthenocissus quinquefolia	five-leaved Virginia-creeper			G5	S4?	С	
	Vitis aestivalis	summer grape			G5	S4	U	
	Vitis labrusca	fox grape			G5	S1	R1/ Ir	
	Vitis riparia	riverbank grape			G5	S5	С	
	POLYGALACEAE	MILKWORT FAMILY						
	Polygala sanguinea	blood-red milkwort			G5	S4	R4	
	Polygala verticillata	whorled milkwort			G5	S4	VU	
	HIPPOCASTANACEAE	BUCKEYE FAMILY						
*	Aesculus hippocastanum	horse chestnut			G?	SE2	lr	
	ACERACEAE	MAPLE FAMILY						
	Acer negundo	Manitoba maple			G5	S5	С	
*	Acer platanoides	Norway maple			G?	SE5	lu	
	Acer rubrum	red maple			G5	S5	С	
	Acer saccharinum	silver maple			G5	S5	С	
	Acer saccharum ssp. saccharum	sugar maple			G5T5	S5	С	

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	Acer X freemanii	freeman's maple			HYB	S5?	R?	
	ANACARDIACEAE	SUMAC FAMILY						
	Rhus glabra	smooth sumac			G5	S5	U	
	Rhus radicans	poison-ivy			G5	S5	С	
	Rhus rydbergii	western poison-ivy			G5T	S5	С	
	Rhus typhina	staghorn sumac			G5	S5	С	
	SIMAROUBACEAE	AILANTHUS FAMILY						
*	Ailanthus altissima	tree-of-heaven			G?	SE5	lr	
	RUTACEAE	RUE FAMILY						
	Zanthoxylum americanum	American prickly-ash			G5	S5	С	
	OXALIDACEAE	WOOD SORREL FAMILY						
	Oxalis stricta	upright yellow wood-sorrel			G5	S5	С	
	GERANIACEAE	GERANIUM FAMILY						
	Geranium maculatum	spotted crane's-bill			G5	S5	С	
	BALSAMINACEAE	TOUCH-ME-NOT FAMILY						
	Impatiens capensis	spotted touch-me-not			G5	S5	С	
	ARALIACEAE	GINSENG FAMILY						
	Aralia nudicaulis	wild sarsaparilla			G5	S5	С	
	APIACEAE	PARSLEY FAMILY						
	Angelica atropurpurea	dark-purple alexanders			G5	S5	R1	
	Cicuta maculata	spotted water-hemlock			G5	S5	С	
*	Daucus carota	wild carrot			G?	SE5	Ic	
	Heracleum lanatum	cow-parsnip			G5	S5	R5	
	Oxypolis rigidior	cowbane			G5	S2	U	
*	Pastinaca sativa	wild parsnip			G?	SE5	lu	
	<i>Sanicula canadensis</i> var. <i>canadensis</i>	Canada snakeroot			G5T5	S4	С	
	Sanicula marilandica	black snakeroot			G5	S5	С	
	Sium suave	hemlock water-parsnip			G5	S5	С	
	GENTIANACEAE	GENTIAN FAMILY						
*	Centaurium erythraea	erythraea-like centaury			G?	SE2	lr	
	Gentiana andrewsii	closed gentian			G4	S4	U	
	Gentianopsis crinita	fringed gentian				S5	R4	
	APOCYNACEAE	DOGBANE FAMILY			1			
	Apocynum androsaemifolium ssp. androsaemifolium	spreading dogbane			G5T5	S5	U	
	Apocynum cannabinum var. cannabinum	Indian hemp			G5T	S5	С	
*	Vinca minor	periwinkle			G?	SE5	lr	

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	ASCLEPIADACEAE	MILKWEED FAMILY						
	<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	swamp milkweed			G5T5	S5	С	
	Asclepias purpurascens	purple milkweed			G4G5	S2	R5	
	Asclepias sullivantii	Sullivant's milkweed			G5	S2	?	
	Asclepias syriaca	common milkweed			G5	S5	С	
	Asclepias tuberosa	butterfly-weed			G5?	S4	U	
*	Cynanchum nigrum	black swallow-wort			G?	SE?	?	
*	Cynanchum rossicum	swallow-wort			G?	SE5	?	
	SOLANACEAE	POTATO FAMILY						
*	Lycopersicon esculentum	tomato			G?	SE2	?	
	Physalis heterophylla	clammy ground-cherry			G5	S4	С	
	Physalis virginiana	Virginia ground-cherry			G5	SU	R1	
*	Solanum carolinense	horse nettle			G5	SE3	lu	
*	Solanum dulcamara	bitter nightshade			G?	SE5	lc	
*	Solanum tuberosum	potato			G?	SE1	?	
	CONVOLVULACEAE	MORNING-GLORY FAMILY						
	<i>Calystegia sepium</i> ssp. <i>angulatum</i>	hedge bindweed			G4G5T ?	SU	С	
	<i>Calystegia spithamaea</i> ssp. <i>Spithamaea</i>	low bindweed			G4G5T 4T5	S4S 5	?	
*	Convolvulus arvensis	field bindweed			G?	SE5	lc	
	Cuscuta sp.	dodder					?	
	BORAGINACEAE	BORAGE FAMILY						
*	Cynoglossum officinale	hound's-tongue			G?	SE5	lr	
*	Echium vulgare	blueweed			G?	SE5	lr	
	Hackelia deflexa	spurred stickweed			G5	S5	?	
	Hackelia virginiana	Virginia stickweed			G5	S5	С	
	Lithospermum caroliniense var. croceum	plains puccoon			G4G5T 4T5	S3	R2	
	PHRYMACEAE	LOPSEED FAMILY			110			
	Phryma leptostachya	lopseed			G5	S4S 5	С	
	VERBENACEAE	VERVAIN FAMILY						
	Verbena hastata	blue vervain			G5	S5	С	
	Verbena stricta	hoarv vervain			G5	S4	R2	
	Verbena urticifolia	white vervain			G5	S5	С	
	LAMIACEAE							
	Clinopodium vulgare	wild basil			G5	S5	U	
	, Collinsonia canadensis	stoneroot			G5	S4	С	

APPENDIX B
LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
*	Glechoma hederacea	creeping Charlie			G?	SE5	lc	
*	Lamium amplexicaule	henbit			G?	SE3	lr	
*	<i>Leonurus cardiaca</i> ssp. <i>cardiaca</i>	common motherwort			G?T?	SE5	lc	
	Lycopus americanus	cut-leaved water-horehound			G5	S5	С	
	Lycopus uniflorus	northern water-horehound			G5	S5	U	
	Mentha arvensis ssp. borealis	American wild mint			G5T5	S5	С	
*	Mentha X piperita	pepper mint			HYB	SE4	lvu	
	Monarda fistulosa	wild bergamot			G5	S5	С	
*	Nepeta cataria	catnip			G?	SE5	lc	
	Physostegia virginiana ssp. virginiana	Virginia false dragonhead			G5T?	S4	R5	
*	<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	common heal-all			G5T?	SE3	С	
	Pycnanthemum verticillatum var. pilosum	hairy mountain-mint			G5T5	S1	R4	
	Pycnanthemum virginianum	Virginia mountain-mint			G5	S4	С	
	Scutellaria lateriflora	mad-dog skullcap			G5	S5	С	
	Stachys hispida	rough hedge-nettle			G4Q	S4S 5	С	
*	Stachys palustris	hedge-nettle			G5	SE5	?	
	PLANTAGINACEAE	PLANTAIN FAMILY						
*	Plantago lanceolata	ribgrass			G5	SE5	lc	
*	Plantago major	common plantain			G5	SE5	lvu	
	OLEACEAE	OLIVE FAMILY						
*	Forsythia viridissima	golden-bells			G?	SE2	?	
	Fraxinus americana	white ash			G5	S5	С	
	Fraxinus nigra	black ash			G5	S5	С	
	Fraxinus pennsylvanica	red ash			G5	S5	С	
	Fraxinus profunda	pumpkin ash			G4	S2	VU	
*	Ligustrum vulgare	common privet			G?	SE5	lvu	
*	Syringa vulgaris	common lilac			G?	SE5	lr	
	SCROPHULARIACEAE	FIGWORT FAMILY						
	Agalinis purpurea	large purple agalinis			G5	S1	R5	
	<i>Agalinis tenuifolia</i> var. <i>macrophylla</i>	slender-leaved agalinis			G4G5 Q	S1?	VU	
	Aureolaria flava	yellow false foxglove			G5	S3	R5	
	Aureolaria pedicularia	fern-leaved false foxglove			G5	S3	R1	
*	Linaria vulgaris	butter-and-eggs			G?	SE5	lc	
	Mimulus ringens	square-stemmed monkey-flower			G5	S5	С	
	Pedicularis lanceolata	swamp wood-betony			G5	S4	VU	

Appendix B	
LIST OF VASCULAR PLANTS LOCATED IN THE ARE	EA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Penstemon digitalis	foxglove beard-tongue			G5	S4S 5	VU	
*	Verbascum blattaria	moth mullein			G?	SE5	Ic	
*	Verbascum thapsus	common mullein			G?	SE5	Ic	
	Veronicastrum virginicum	Virginia culver's-root			G4	S2	R4	
	BIGNONIACEAE	TRUMPET-CREEPER FAMILY						
	Campsis radicans	trumpet creeper			G5	S2	R5/	
		· · · ·					lr	
*	Catalpa bignonioides	common catalpa			G4G5	SE1	?	
*	Catalpa speciosa	northern catalpa			GU	SE1	?	
	CAMPANULACEAE	BLUEBELL FAMILY						
*	Campanula rapunculoides	creeping bellflower			G?	SE5	С	
	Lobelia inflata	Indian tobacco			G5	S5	U	
	Lobelia siphilitica	great lobelia			G5	S5	С	
	Lobelia spicata	pale-spiked lobelia			G5	S4	VU	
	RUBIACEAE	MADDER FAMILY						
	Cephalanthus occidentalis	eastern buttonbush			G5	S5	С	
	Galium aparine	cleavers			G5	S5	С	
	Galium asprellum	rough bedstraw			G5	S5	R3	
	Galium circaezans	white wild licorice			G5	S5	С	
*	Galium mollugo	white bedstraw			G?	SE5	?	
	Galium palustre	marsh bedstraw			G5	S5	R4	
	Galium pilosum var. pilosum	hairy bedstraw			G5T?	S3	R3	
	Galium trifidum ssp. trifidum	small bedstraw			G5T5	S5	R5	
	Galium triflorum	sweet-scented bedstraw			G5	S5	С	
	CAPRIFOLIACEAE	HONEYSUCKLE FAMILY						
	Diervilla lonicera	bush honeysuckle			G5	S5	R1	
	Lonicera canadensis	American fly honeysuckle			G5	S5	R1	
	Lonicera dioica	glaucous honeysuckle			G5	S5	С	
*	Lonicera maackii	amur honeysuckle			G?	SE2	lr	
*	Lonicera tatarica	Tartarian honeysuckle			G?	SE5	lu	
	Sambucus canadensis	common elderberry			G5	S5	С	
	Sambucus racemosa ssp.	red-berried elderberry			G5T5	S5	R4	
*	Symphoricarnos occidontalis	wolfberry			G5	SE3	2	
$\left  - \right $	Vihurnum acorifolium	manle-leaved viburpum			C5	5L3 SE	· C	
*	Viburnum lantana	honding wayfaring trop			C2	30 SE1	2	
	Viburnum lantaga					SEZ SE	( (	
*	Viburnum macrosonhalum				65	30		
*					C.		(	
	viburnum opulus	gueider rose			Gb	SE4	(	

APPENDIX B
LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Viburnum rafinesquianum	downy arrow-wood			G5	S5	С	
	Viburnum recognitum	southern arrow-wood			G5	S4	R1	
	DIPSACACEAE	TEASEL FAMILY						
*	<i>Dipsacus fullonum</i> ssp. <i>sylvestris</i>	wild teasel			G?T?	SE5	lc	
	ASTERACEAE	ASTER FAMILY						
*	<i>Achillea millefolium</i> ssp. <i>millefolium</i>	common yarrow			G5T?	SE?	С	
	Ambrosia artemisiifolia	common ragweed			G5	S5	С	
	Ambrosia trifida	giant ragweed			G5	S5	С	
	Anaphalis margaritacea	pearly everlasting			G5	S5	R1?	
	Antennaria neglecta	field pussytoes			G5	S5	R2	
	Antennaria parlinii ssp. fallax	Parlin's pussytoes			G4G5T ?	SU	С	
*	Arctium lappa	great burdock			G?	SE5	lr	
*	Arctium minus ssp. minus	common burdock			G?T?	SE5	Ic	
*	Artemisia vulgaris	common mugwort			G?	SE5	lr	
	Aster cordifolius	heart-leaved aster			G5	S5	U	
	Aster ericoides ssp. ericoides	white heath aster			G5T?	S5	С	
	Aster laevis var. laevis	smooth blue aster			G5T?	S5	U	
	<i>Aster lanceolatus</i> ssp. <i>lanceolatus</i>	tall white aster			G5T?	S5	С	
	Aster lateriflorus var. lateriflorus	calico aster			G5T5	S5	С	
	Aster macrophyllus	large-leaved aster			G5	S5	С	
	Aster novae-angliae	New England aster			G5	S5	С	
	Aster oolentangiensis	sky blue aster			G5	S4	R4	
	Aster pilosus var. pilosus	hairy aster			G5T?	S5	С	
	Aster praealtus var. praealtus	willow aster	THR	THR	G5T?	S2	R2	SARA (1), PA
	Aster shortii	short's aster	NAR	NAR	G4G5	S4	U	
*	Aster subulatus var. subulatus	annual saltmarsh aster			G5	SE2	lr	
	Aster umbellatus var. umbellatus	flat-top white aster			G5T?	S5	R3	
	Aster urophyllus	arrow-leaved aster			G4	S4	С	
	Bidens frondosa	devil's beggar-ticks			G5	S5	С	
	Bidens tripartita	European beggar-ticks			G5	S5	С	
*	Centaurea maculosa	spotted knapweed			G?	SE5	lvu	
*	Chrysanthemum Ieucanthemum	ox-eye daisy			G?	SE5	lc	
*	Cichorium intybus	chicory			G?	SE5	lc	

	<b>A</b> PPENDIX <b>B</b>	
LIST OF VASCULAR	PLANTS LOCATED IN THE ARE	EA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
*	Cirsium arvense	Canada thistle			G?	SE5	lc	
	Cirsium discolor	field thistle			G5	S4	U	
*	Cirsium vulgare	bull thistle			G5	SE5	lc	
	Conyza canadensis	horseweed			G5	S5	С	
	Coreopsis tripteris	tall tickseed			G5	S2	U	
	Erechtites hieracifolia	fire-weed			G5	S5	С	
	Erigeron annuus	daisy fleabane			G5	S5	С	
	Erigeron philadelphicus ssp. philadelphicus	Philadelphia fleabane			G5T5	S5	С	
	Erigeron strigosus	daisy fleabane			G5	S5	С	
	Eupatorium altissimum	tall joe-pyeweed			G5	S1	R3/	
							lu	
	<i>Eupatorium maculatum</i> ssp. <i>maculatum</i>	spotted joe-pye-weed			G5T5	S5	С	
	Eupatorium perfoliatum	perfoliate thoroughwort			G5	S5	С	
	<i>Eupatorium purpureum</i> var.	purple joe-pye-weed			G5T?	S3	VU	
	purpureum							
	Euthamia graminifolia	flat-topped bushy goldenrod			G5	S5	С	
	Euthamia gymnospermoides	viscid bushy goldenrod			G5	S1	R3	
	Helenium autumnale	common sneezeweed			G5	S5	U	
*	Helenium flexuosum	purple-headed sneezeweed			G5	SE2 ?	?	
	Helianthus divaricatus	rough woodland sunflower			G5	S5	С	
	Helianthus giganteus	tall wild sunflower			G5	S5	С	
*	Helianthus tuberosus	Jerusalem artichoke			G5	SE5	lu	
*	Hieracium aurantiacum	devil's paintbrush			G?	SE5	lr	
*	<i>Hieracium caespitosum</i> ssp. <i>caespitosum</i>	field hawkweed				SE5	lu	
	Hieracium scabrum	rough hawkweed			G5	S4	VU	
	<i>Krigia biflora</i> var. <i>biflora</i>	two-flowered Cynthia			G5	S2	U	
	Lactuca biennis	biennial lettuce			G5	S5	VU	
	Lactuca canadensis	tall lettuce			G5	S5	С	
*	Lactuca serriola	prickly lettuce			G?	SE5	lc	
	<i>Liatris aspera</i> var. <i>intermedia</i>	rough blazing star			G4G5T ?	S2	R2	
	Liatris spicata	spiked blazing star	THR	THR	G5	S2	R5	SARA (1), OESA (4), PA
*	Matricaria matricarioides	pineapple-weed			G5	SE5	lu	
	Prenanthes alba	white rattlesnake-root			G5	S5	С	
	Prenanthes racemosa ssp.	glaucous white rattlesnake-root			G5T?	SU	R4	

# APPENDIX B LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

Scientific Name		Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	racemosa							
	Ratibida pinnata	gray-headed coneflower			G5	S2S 3	U	
*	Rudbeckia fulgida	orange coneflower			G5	S1	?	
	Rudbeckia hirta	black-eyed Susan			G5	S5	С	
	Senecio aureus	golden groundsel			G5	S5	VU	
	<i>Silphium terebinthinaceum</i> var. <i>terebinthinaceum</i>	prairie dock			G4G5T 4T5	S1	VU	
	<i>Solidago altissima</i> var. <i>altissima</i>	tall goldenrod				S5	С	
	Solidago caesia	blue-stem goldenrod			G5	S5	С	
	Solidago canadensis	Canada goldenrod			G5	S5	С	
	Solidago gigantea	giant goldenrod			G5	S5	VU	
	Solidago juncea	early goldenrod			G5	S5	U	
	<i>Solidago nemoralis</i> ssp. <i>nemoralis</i>	gray goldenrod			G5T5	S5	С	
	Solidago ohioensis	Ohio goldenrod			G4	S4	?	
	Solidago riddellii	Riddell's goldenrod	SC	SC	G5	S3	VU	SARA (1), OESA (5)
	<i>Solidago rigida</i> ssp. <i>rigida</i>	stiff-leaved goldenrod			G5T5	S3	U	
	Solidago rugosa ssp. rugosa	rough goldenrod			G5T?	S5	С	
*	Solidago sempervirens	seaside goldenrod			G5	SE2	lvu	
*	Sonchus arvensis ssp. arvensis	field sow-thistle			G?T?	SE5	Ic	
*	Sonchus asper ssp. asper	spiny-leaved sow-thistle			G?T?	SE5	lu	
*	Sonchus oleraceus	common sow-thistle			G?	SE5	lvu	
*	Tanacetum vulgare	common tansy			G?	SE5	lr	
*	Taraxacum officinale	common dandelion			G5	SE5	lc	
*	Tragopogon dubius	doubtful goat's-beard			G?	SE5	Ic	
	Vernonia gigantea*	ironweed			G5T	S3	С	
	Vernonica missurica*	ironweed			G4G5	S3?	?	
	Xanthium strumarium	tumor-curing cocklebur			G5	S5	С	
	BUTOMACEAE	FLOWERING RUSH FAMILY						
*	Butomus umbellatus	flowering-rush			G5	SE5	Ic	
	ALISMATACEAE	WATER-PLANTAIN FAMILY				05-		
	Alisma plantago-aquatica	common water-plantain			G5	SRF	C	
	Sagittaria latifolia	broad-leaved arrowhead			G5	S5	С	
	HYDROCHARIFACEAE	FROG'S-BIT FAMILY			05			
	<i>Liodea nuttallii</i>	Nuttall's waterweed			G5	S4	R1	
	Vallisneria americana	water-celery			G5	S5	VU	
	PUTAMOGETONACEAE	PONDWEED FAMILY		1				

APPENDIX B
LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
Potamogeton foliosus	leafy pondweed			G5	S5	U	
Potamogeton nodosus	knotty pondweed			G5	S5	R2	
Potamogeton sp.	pondweed					?	
NAJADACEAE	NAIAD FAMILY						
Najas flexilis	slender najas			G5	S5	VU	
ARACEAE	ARUM FAMILY						
<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	small jack-in-the-pulpit			G5T5	S5	С	
LEMNACEAE	DUCKWEED FAMILY						
Lemna minor	lesser duckweed			G5	S5	С	
COMMELINACEAE	SPIDERWORT FAMILY						
Tradescantia ohiensis	Ohio spiderwort			G5	S2	VU	
JUNCACEAE	RUSH FAMILY						
Juncus alpinoarticulatus	Richardson's rush			G5	S5	R5	
Juncus biflorus	two-flowered rush			G5Q	S1	R3	
Juncus brachycarpus	short-fruited rush			G4G5	S1	R3	
Juncus bufonius	toad rush			G5	S5	VU	
Juncus dudleyi	Dudley's rush			G5	S5	С	
Juncus greenei	Greene's rush			G5	S3	R3	
Juncus marginatus	grass-leaved rush			G5	S2	R1	
Juncus nodosus	knotted rush			G5	S5	U	
Juncus tenuis	path rush			G5	S5	R1	
Juncus torreyi	Torrey's rush			G5	S5	С	
Luzula multiflora ssp. multiflora	woodrush			G5T5	S5	U	
CYPERACEAE	SEDGE FAMILY						
Carex arctata	drooping wood sedge			G5?	S5	?	
Carex bebbii	Bebb's sedge			G5	S5	С	
Carex blanda	woodland sedge			G5?	S5	С	
Carex brevior	shorter sedge			G5?	S4S 5	R4	
Carex buxbaumii	brown sedge			G5	S5	VU	
Carex cephaloidea	thin-leaved sedge			G5	S5	U	
Carex cephalophora	oval-headed sedge			G5	S5	С	
Carex foena	bronzy sedge			G5	S5	R1	
Carex granularis	meadow sedge			G5	S5	С	
Carex lacustris	lake-bank sedge			G5	S5	С	
Carex lasiocarpa	slender sedge			G5	S5	R2	
Carex normalis	larger straw sedge			G5	S4	С	
Carex pellita	woolly sedge			G5	S5	С	

	APPENDIX B
L	IST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Carex pensylvanica	Pennsylvania sedge			G5	S5	С	
	Carex pseudo-cyperus	cypress-like sedge			G5	S5	?	
	Carex radiata	radiate sedge			G4	S4	С	
	Carex rosea	stellate sedge			G5	S5	С	
	Carex scoparia	pointed broom sedge			G5	S5	R3	
	Carex squarrosa	squarrose sedge			G4G5	S2	С	
	Carex stipata	awl-fruited sedge			G5	S5	С	
	Carex stricta	tussock sedge			G5	S5	С	
	Carex swanii	swan's sedge			G5	S3	С	
	Carex tenera	straw sedge			G5	S5	С	
	Carex trichocarpa	hairy-fruited sedge			G4	S3	?	
	Carex viridula ssp. viridula	greenish sedge			G5T5	S5	R4	
	Carex vulpinoidea	fox sedge			G5	S5	С	
	Carex woodii	wood's sedge			G4Q	S4	VU	
	Cyperus esculentus	yellow nut-grass			G5	S5	С	
	Cyperus odoratus	fragrant umbrella sedge			G5	S5	С	
	Cyperus strigosus	straw-colored umbrella sedge			G5	S5	С	
	Eleocharis erythropoda	red-footed spike-rush			G5	S5	С	
	Eleocharis obtusa	blunt spike-rush			G5	S5	С	
	Rhynchospora capitellata	small-headed beaked-rush			G5	S4	R3	
	Scirpus atrovirens	dark-green bulrush			G5?	S5	С	
	Scirpus pendulus	lined bulrush			G5	S5	С	
	Scirpus validus	American great bulrush			G?	S5	U	
	Scleria triglomerata	tall nut-rush			G5	S1	R4	
	POACEAE	GRASS FAMILY						
*	Agrostis gigantea	red-top			G4G5	SE5	Ic	
	Agrostis stolonifera	redtop			G5	S5	U	
	Andropogon gerardii	big bluestem			G5	S4	U	
	Andropogon virginicus	Virginia broom-sedge			G5	S4	VU	
*	Anthoxanthum odoratum ssp. odoratum	sweet vernal grass			G?T?	SE4	?	
	Aristida purpurascens var. purpurascens	arrow-feather three-awn			G5T?	S1	R4	
*	Avena fatua	wild oats			G?	SE3	lr	
*	Bromus inermis ssp. inermis	awnless brome			G4G5T ?	SE5	lc	
*	Bromus tectorum	downy chess			G?	SE5	lu	
	Calamagrostis canadensis	blue-joint grass			G5	S5	С	
*	Dactylis glomerata	orchard grass			G?	SE5	lc	
	Danthonia spicata	poverty oat grass			G5	S5	С	

Appendix B	
LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF	<b>INVESTIGATION</b>

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
*	Digitaria ischaemum	small crabgrass			G?	SE5	lu	
*	Digitaria sanguinalis	large crabgrass			G5	SE5	lu	
*	Echinochloa crusgalli	common barnyard grass			G?	SE5	lc	
	Echinochloa microstachya	small-spiked barnyard grass			G5Q	S4S 5	R?	
	Elymus canadensis	nodding wild rye			G5	S4S 5	VU	
	Elymus hystrix	bottle-brush grass			G5	S5	С	
*	Elymus repens	quack grass			G?	SE5	Ic	
	Elymus virginicus var. virginicus	Virginia wild rye			G5T?	S5	С	
*	Festuca arundinacea	tall fescue			G?	SE5	lc	
*	Festuca pratensis	meadow fescue			G5	SE5	lr	
	Festuca rubra ssp. rubra	red fescue			G5T4	S5	lr	
	Glyceria striata	fowl meadow grass			G5	S5	С	
	<i>Hierochloe odorata</i> ssp. <i>odorata</i>	sweet grass			G5T?	S4	R3	
*	Hordeum jubatum ssp. jubatum	squirrel-tail grass			G5T?	SE5	lu	
	Leersia oryzoides	rice cut grass			G5	S5	С	
	Leersia virginica	white cut grass			G5	S4	С	
*	Lolium perenne	English rye grass			G?	SE4	lu	
	Milium effusum	wood millet			G5	S4S 5	R3	
	Muhlenbergia frondosa	leafy satin grass			G5	S4	VU	
	<i>Muhlenbergia mexicana</i> var. <i>mexicana</i>	Mexican satin grass			G5T?	S5	U	
	Panicum acuminatum var. acuminatum	acuminate panic grass			G5T	S5	С	
	Panicum capillare	witch grass			G5	S5	С	
	Panicum columbianum var. siccanum	panic grass			G5T5	S4	R1	
*	Panicum dichotomiflorum	fall panicum			G5	SE5	Ic	
	Panicum latifolium	broad-leaved panic grass			G5	S4	U	
	Panicum sphaerocarpon	rough-fruited panic grass			G5	S3	R5	
	Panicum virgatum	switch grass			G5	S4	U	
	Paspalum setaceum	bristle-like paspalum			G5	S2	R4	
	Phalaris arundinacea	reed canary grass			G5	S5	С	
*	Phleum pratense	timothy			G?	SE5	lc	
	Phragmites australis	common reed			G5	S5	С	
	Poa compressa	Canada blue grass			G?	SE5	С	
	Poa palustris	fowl meadow grass			G5	S5	VU	

	<b>A</b> PPENDIX <b>B</b>	
LIST OF VASCULAR	PLANTS LOCATED IN THE ARE	EA OF INVESTIGATION

Scientific Name		Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Poa pratensis ssp. pratensis	Kentucky bluegrass			G5T5?	S5	С	
	Schizachyrium scoparium	little bluestem			G5	S4	U	
*	Setaria faberi	giant foxtail			G?	SE4	Ic	
*	Setaria pumila	yellow foxtail			G?	SE5	lc	
*	Setaria viridis	green foxtail			G?	SE5	lc	
	Sorghastrum nutans	Indian grass			G5	S4	R5	
	Spartina pectinata	tall cord grass			G5	S4	U	
	TYPHACEAE	CAT-TAIL FAMILY						
	Typha angustifolia	narrow-leaved cattail			G5	SE5	С	
	Typha latifolia	broad-leaved cattail			G5	S5	U	
	LILIACEAE	LILY FAMILY						
	Aletris farinosa	colic-root	THR	THR	G5	S2	R4	SARA (1), OESA (4), PA
	Allium canadense var. canadense	Canada wild onion			G5T5	S5	С	
*	Asparagus officinalis	garden asparagus			G5?	SE5	lc	
*	Convallaria majalis	lily-of-the-valley			G5	SE5	lr	
	<i>Erythronium americanum</i> ssp. <i>americanum</i>	yellow trout lily			G5T5	S5	С	
*	Hemerocallis fulva	orange day-lily			G?	SE5	lu	
	Hypoxis hirsuta	yellow star-grass			G5	S3	R5	
	Maianthemum racemosum ssp. racemosum	false Solomon's seal			G5T5	S5	С	
	Maianthemum stellatum	star-flowered Solomon's seal			G5	S5	С	
	Muscari botryoides	grape hyacinth			G?	SE3	?	
*	Narcissus pseudonarcissus	daffodil			G?	SE2	lr	
*	Ornithogalum umbellatum	summer snowflake			G2?	SE3	lr	
	Polygonatum biflorum	hairy Solomon's seal			G5	S4	С	
	Polygonatum pubescens	hairy Solomon's seal			G5	S5	С	
	Streptopus roseus	rose twisted-stalk			G5	S5	?	
	Trillium grandiflorum	white trillium			G5	S5	С	
	Uvularia sessilifolia	sessile-leaved bellwort			G5	S4	R5	
	IRIDACEAE	IRIS FAMILY						
	Iris virginica	southern blue-flag			G5	S5	С	
	Sisyrinchium albidum	white blue-eyed-grass			G5?	S1	R4	
	Sisyrinchium angustifolium	pointed blue-eyed-grass			G5	S4	С	
	SMILACACEAE	CATBRIER FAMILY						
	Smilax herbacea	herbaceous carrion flower			G5	S4	R1	
	Smilax hispida	bristly greenbrier			G5	S4	С	

# APPENDIX B LIST OF VASCULAR PLANTS LOCATED IN THE AREA OF INVESTIGATION

	Scientific Name	Common Name	COSEWIC	COSSARO	Grank	Srank	Local Status	Legal Status
	Smilax lasioneura	hairy-nerved carrion flower			G5	S4	С	
	DIOSCOREACEAE	YAM FAMILY						
	Dioscorea quaternata	wild yam-root			G5	S4	С	
	ORCHIDACEAE	ORCHID FAMILY						
	<i>Cypripedium calceolus</i> var. <i>pubescens</i>	large yellow lady's slipper			G5T	S5	R2	
*	Epipactis helleborine	common helleborine			G?	SE5	lr	
	SAPINDACEAE	SOAPBERRY FAMILY						
*	Koelreuteria paniculata	Golden rain tree					?	
	TAMARICACEAE	TAMARISK FAMILY						
*	Tamarix ramosissima	Tamarisk					?	
	MORACEAE	FIG FAMILY						
*	<i>Ficus</i> sp.	Fig tree					?	

Note: Species status current to October 2007 \* Species introduced to Ontario

#### Local Status Distribution and Status of the Vascular Plants of Southwestern Ontario

Status of the plants in Essex County was thoroughly investigated by the Ontario Ministry of Natural Resources through the use of plant stations. Plant stations are locations that are defined as a 1 km radius around a plant occurrence. Plant rarity is based on the number of stations for a native plant species. A variable cut-off is used for the number of stations based on the size of the municipality or site district and by the intensity of fieldwork that has been carried out in the area.

- R Native and rare, based on 5 or fewer recent (post-1963) stations. A station is a population separated by at least 1 kilometer from the nearest population of the same species.
- R# Rare, number of recent stations.
- R? Rare, exact number of stations not known.
- Rh Rare, known only from historic (pre-1964) record.
- VU Native and very uncommon, based on 6 to 8 recent stations.
- U Native and uncommon, based on 9 to 15 recent stations.
- C Native and common, based on more than 15 recent stations.
- I Introduced and persisting of cultivation.
- Ir Introduced and rare, based on 5 or fewer recent stations.
- Ivu Introduced and very uncommon, based on 6 to 8 recent stations.
- lu Introduced and uncommon, based on 9 to 15 recent stations.
- Ic Introduced and common, based on more than 15 recent stations.
- Ih Introduced and known only from historic (pre-1964) records
- ? Questionable record. These are typically literature reports for which no specimen is known, or other records for which there is some reason to doubt either the identity or origin of the record
- ? Not listed as present within Essex County, but was found by LGL staff in 2006.

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Comments	LGL Polygon Reference			
Terrestria	rrestrial-Natural/Semi-Natural						
TPO	OPEN TALL-GRASS PRAIRIE						
TPO2-1	Fresh - Moist Tallgrass Prairie	Canopy: Eastern cottonwood ( <i>Populus deltoides</i> ssp. deltoides) is dominant. Understorey: Silky dogwood ( <i>Cornus amomum</i> ssp. <i>obliqua</i> ) is dominant with gray dogwood ( <i>Cornus foemina</i> ssp. <i>racemosa</i> ) and multiflora rose ( <i>Rosa multiflora</i> ) as associates. Ground Cover: Big bluestem ( <i>Andropogon gerardi</i> ), Canadian tick-trefoil ( <i>Desmodium canadense</i> ), common reed ( <i>Phragmites australis</i> ), gray goldenrod ( <i>Solidago nemoralis</i> ssp. <i>nemoralis</i> ), gray-headed coneflower ( <i>Ratibida pinnata</i> ), Indian grass ( <i>Sorghastrum nutans</i> ), ironweed ( <i>Vernonia gigantea</i> ), little bluestem ( <i>Schizachyrium scoparium</i> ), switch grass ( <i>Panicum virgatum</i> ), Virginia broom-sedge ( <i>Andropogon virginicus</i> ), Virginia mountain-mint ( <i>Pycnanthemum virginianum</i> ), wild bergamot ( <i>Monarda fistulosa</i> ) and wild carrot ( <i>Daucus carota</i> ) are abundant with occasional blood-red milkwort ( <i>Polygala sanguinea</i> ), butterfly-weed ( <i>Asclepias tuberosa</i> ), calico aster ( <i>Aster lateriflorus</i> var. <i>lateriflorus</i> ), Canada bluegrass ( <i>Poa compressa</i> ), Canada goldenrod ( <i>Solidago canadensis</i> ), colic-root ( <i>Aletris farinosa</i> ), cut-leaved water- horehound ( <i>Lycopus americanus</i> ), early goldenrod ( <i>Solidago juncea</i> ), field thistle ( <i>Cirsium discoloi</i> ), flowering spurge ( <i>Euphorbia corollala</i> ), Kentucky bluegrass ( <i>Poa pratensis</i> sp. <i>rugosa</i> ), rough-headed bush-clover ( <i>Lespedeza capitata</i> ), slender-leaved agalinis (Agalinis tenuifolia var. macrophylla), smooth blue aster ( <i>Aster novae-angliae</i> ), orchard grass ( <i>Dactylis glomerata</i> ), prickly raspberry ( <i>Rubus flagellaris</i> ), rough goldenrod ( <i>Solidago rigida ssp. rigida</i> ), swamp milkweed ( <i>Asclepias incarnata</i> ), slender-leaved agalinis (Agalinis tenuifolia var. macrophylla), smooth blue aster ( <i>Aster laevis</i> var. <i>laevis</i> ), spiked blazing star ( <i>Liatris spicata</i> ), stiff-leaved goldenrod ( <i>Solidago rigida</i> ssp. rigida), swamp milkweed ( <i>Coreopsis tripteris</i> ), tall tickseed ( <i>Coreopsis tripteris</i> ), tall secue ( <i>Festuca arundinacea</i> ), tall goldenrod ( <i>Solidago altissima</i> var. <i>altissima</i> ), tall	<ul> <li>Tree cover &lt;= 25%; shrub cover &lt;= 25%.</li> <li>Subject to seasonal extremes in moisture conditions; spring flooding and summer drought (TPO).</li> <li>Dominated by Prairie graminoids and forbs (2-1).</li> <li>Pioneer community resulting from, or maintained by, frequent disturbance by fire.</li> </ul>	ANS1A, BBA4EC, BBA4MB, ESA1, LAM1, MAL1D, MAL3B, NAR4A, NAR4B, NAR4B, NAR15, NAR16, NCH2E, NCH4B, NCH4Z, NCH12B, NSG7A, NSG7C, OAK3, OAK4, RED5, RED12, YWK1B			

<sup>&</sup>lt;sup>1</sup> Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Sciences Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. North Bay, Ontario.

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Comments	LGL Polygon Reference
TPS	TALL-GRASS	SAVANNAH	l .	
TPS2-1	Fresh - Moist Pin Oak - Bur Oak Tallgrass Savannah	Canopy: Pin oak ( <i>Quercus palustris</i> ) and bur oak ( <i>Quercus macrocarpa</i> ) are co-dominant with American elm ( <i>Ulmus americana</i> ), eastern cottonwood, red ash ( <i>Fraxinus pennsylvanica</i> ) and shagbark hickory ( <i>Carya ovata</i> var. <i>ovata</i> ) as associates. Understorey: American hazel ( <i>Corylus americana</i> ), black ash ( <i>Fraxinus nigra</i> ), black locust ( <i>Robinia pseudo-acacia</i> ), common buckthorn ( <i>Rhamnus cathartica</i> ), Drummond's dogwood ( <i>Cornus drummondi</i> ), gray dogwood, Manitoba maple ( <i>Acer negundo</i> ), red ash, staghorn sumac ( <i>Rhus typhina</i> ) and Tartarian honeysuckle ( <i>Lonicera tatarica</i> ). Ground Cover: Common dandelion ( <i>Taraxacum officinale</i> ), eastern cottonwood, gray goldenrod, Pennsylvania sedge ( <i>Carex pensylvanica</i> ), spotted crane's bill ( <i>Geranium maculatum</i> ), tall tickseed, yellow avens ( <i>Geum aleppicum</i> ) and yellow trout lily ( <i>Erythronium americanum</i> ssp. <i>americanum</i> ).	<ul> <li>25% &lt; Tree Cover &lt;= 35% with prairie graminoids and forbs in the Ground Cover (TPS).</li> <li>Seasonal flooding followed by summer drought.</li> <li>Fresh - Moist conditions, dominated by Pin Oak and Bur Oak (2-1).</li> <li>Young Community.</li> </ul>	ESA5
TPW	TALL-GRASS	WOODLAND		
TPW2-1	Fresh - Moist Black Oak - White Oak Tallgrass Woodland	Canopy: Black oak ( <i>Quercus velutina</i> ) and pin oak are dominant with black cherry ( <i>Prunus serotina</i> ), eastern cottonwood, freeman's maple ( <i>Acer X freemanil</i> ) and white oak ( <i>Quercus alba</i> ) as associates. Understorey: Black cherry is dominant with American hazel, gray dogwood, prairie rose ( <i>Rosa setigera</i> ), riverbank grape ( <i>Vitis riparia</i> ), sassafras ( <i>Sassafras albidum</i> ), staghorn sumac, thimble-berry ( <i>Rubus occidentalis</i> ) and white mulberry ( <i>Morus alba</i> ) as associates. Ground Cover: Eastern bracken-fern ( <i>Pteridium aquilinum var. latiusculum</i> ), four-flowered loosestrife ( <i>Lysimachia quadriflora</i> ), glaucous white rattlesnake-root ( <i>Prenanthes racemosa</i> ssp. <i>racemosa</i> ), many-flowered agrimony ( <i>Agrimony parviflora</i> ), orchard grass, spotted crane's bill and swamp white oak ( <i>Quercus bicolor</i> ).	<ul> <li>35% &lt; Tree Cover &lt;= 60% with prairie graminoids and forbs in the Ground Cover (TPS).</li> <li>Seasonal flooding followed by summer drought.</li> <li>Fresh - Moist conditions, dominated by Black Oak and White Oak (2-1).</li> <li>Mid-age to Mature Community.</li> </ul>	ANS1, ANS2C
TPW2-2	Fresh - Moist Pin Oak Tallgrass Woodland	Canopy: Pin oak is dominant with black cherry and freeman's maple as associates. Understorey: Black cherry is dominant with American hazel, gray dogwood, prairie rose, riverbank grape, sassafras, staghorn sumac, thimble-berry and white mulberry as associates. Ground Cover: Eastern bracken-fern, many-flowered agrimony, orchard grass, spotted crane's bill and swamp white oak.	<ul> <li>35% &lt; Tree Cover &lt;= 60% with prairie graminoids and forbs in the Ground Cover (TPS).</li> <li>Seasonal flooding followed by summer drought.</li> <li>Fresh - Moist conditions, dominated by Pin Oak (2-2).</li> <li>Mid-age to Mature Community.</li> </ul>	ANS2

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation	Species Association	Comments	LGL Polygon
FOD		FOREST		Relefence
FOD1-3	Dry - Fresh Black Oak Deciduous Forest	<ul> <li>Canopy: Black oak, pin oak, freeman's maple and eastern cottonwood are dominant with American elm, black cherry and swamp white oak as associates.</li> <li>Subcanopy: American elm, black oak, black cherry and red maple (<i>Acer rubrum</i>).</li> <li>Understorey: Black cherry and common reed are co-dominant with American hazel, gray dogwood, narrow-leaved crabapple (<i>Malus coronaria</i>), red ash and sassafras as associates.</li> <li>Ground Layer: Common reed, eastern bracken-fern (<i>Pteridium aquilinum</i> var. <i>latiusculum</i>), inserted Virginia-creeper (<i>Parthenocissus inserta</i>), Pennsylvania sedge and riverbank grape are dominant with garlic mustard (<i>Alliaria petiolata</i>), spotted crane's bill and wood anemone (<i>Anemone quinquefolia</i> var. <i>quinquefolia</i>) as associates.</li> </ul>	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Black Oak is dominant (1-3).</li> <li>Sand and loam soils with rapid drainage in upper to middle slope positions (Dry-Fresh).</li> <li>Mature Community.</li> </ul>	MAL9, MAL11, YWK2
FOD1-4	Dry - Fresh Mixed Oak Deciduous Forest	Canopy: Black oak and white oak are dominant with eastern cottonwood, pin oak and swamp white oak as associates. Subcanopy: Black oak and pin oak are dominant with abundant black cherry. Understorey: American hazel and gray dogwood are co- dominant. Ground Layer: Canada goldenrod, common reed, eastern bracken-fern, inserted Virginia-creeper, interrupted fern ( <i>Osmunda claytoniana</i> ), rose twisted-stalk ( <i>Streptopus roseus</i> ), Royal fern ( <i>Osmunda regalis</i> ) and spotted crane's bill are dominant.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>More than two Oak species are dominant (1-4).</li> <li>Sand and loam soils with rapid drainage in upper to middle slope positions (Dry-Fresh).</li> <li>Mid-age to Mature Community.</li> </ul>	MAL1, MAL1E
FOD2-2	Dry - Fresh Oak - Hickory Deciduous Forest	Canopy: Black oak, swamp white oak and shagbark hickory are dominant with bur oak, pin oak, red oak (Quercus rubra), freeman's maple and white oak as associates. Subcanopy: Black cherry and freeman's maple are co- dominant. Understorey: Black cherry and choke cherry ( <i>Prunus</i> <i>virginiana</i> ssp. virginiana) are co-dominant with American elm and red ash as associates. Ground Layer: Garlic mustard, large-leaved aster ( <i>Aster</i> <i>macrophyllus</i> ), spotted crane's bill and yellowish enchanter's nightshade ( <i>Circaea lutetiana</i> ssp. <i>canadensis</i> ) are dominant with common blackberry ( <i>Rubus</i> <i>allegheniensis</i> ), inserted Virginia-creeper, Pennsylvania sedge, western poison-ivy ( <i>Rhus rydbergii</i> ), wild red raspberry ( <i>Rubus idaeus</i> ssp. <i>melanolasius</i> ) and yellow trout lily as associates.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Oak and Hickory are dominant (2-2).</li> <li>Sand and loam soils with rapid drainage in upper to middle slope positions (Dry-Fresh).</li> <li>Mature Community.</li> </ul>	ESA2

## SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

# Vegetation Type LGL Polygon Reference ELC Code **Species Association** Comments

FOD4	Dry - Fresh Deciduous Forest	Canopy: Manitoba maple, black locust and eastern cottonwood are dominant with black cherry, freeman's maple, American elm and black walnut ( <i>Juglans nigra</i> ) as associates. Subcanopy: Black cherry, Manitoba maple and white mulberry. Understorey: Manitoba maple is dominant with abundant black cherry, prairie rose, Tartarian honeysuckle and white mulberry with some gray dogwood, poison-ivy ( <i>Rhus</i> <i>radicans</i> ), red ash, riverbank grape, smooth sumac ( <i>Rhus</i> <i>glabra</i> ), staghorn sumac and freeman's maple. Ground Layer: Garlic mustard is dominant with common dandelion ( <i>Taraxacum officinale</i> ), cleavers ( <i>Galium</i> <i>aparine</i> ) and inserted Virginia-creeper.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Tree species associations that are either relatively uncommon or a result of disturbance or management (4).</li> <li>Sand and loam soils with rapid drainage in upper to middle slope positions (Dry-Fresh).</li> <li>Young Community.</li> </ul>	BBA1A, BBA7,BBA8, BBA12, BBBA14, MAL5, NCH7H, NGM1
FOD7-1	Fresh - Moist White Elm Lowland Deciduous Forest	Canopy: American elm is dominant with abundant standing snags of red ash with some black cherry, eastern cottonwood, pin oak and swamp white oak. Subcanopy: American elm, pin oak and swamp white oak are dominant. Understorey: Gray dogwood is dominant with American hazel, choke cherry, prairie rose and Tartarian honeysuckle as associates. Ground Layer: Common dandelion, inserted Virginia- creeper, Manitoba maple, marsh bedstraw ( <i>Galium</i> <i>palustre</i> ), marsh fern ( <i>Thelypteris palustris</i> var. <i>pubescens</i> ) and Sensitive fern.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Lowland deciduous forest (7), dominated by White Elm (-1).</li> <li>Sand, loam and clay soils that are poorly drained, in lower slope, mid slope, and bottomland positions (Fresh-Moist).</li> <li>Mid-age community.</li> </ul>	NAR12
FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest	Canopy: Red ash is dominant with American elm, eastern cottonwood, black cherry and red maple as associates. Subcanopy: American elm, black cherry, glossy buckthorn ( <i>Rhamnus frangula</i> ), Manitoba maple, pin oak and red ash. Understorey: Black walnut, common buckthorn, choke cherry, gray dogwood, multiflora rose, nannyberry ( <i>Viburnum lentago</i> ), prairie rose, red ash, staghorn sumac and Tartarian honeysuckle. Ground Layer: Common dandelion, inserted Virginia- creeper, Manitoba maple, wild parsnip ( <i>Pastinaca sativa</i> ) and yellowish enchanter's nightshade.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Lowland deciduous forest (7), dominated by Red Ash (-2).</li> <li>Sand, loam and clay soils that are poorly drained, in lower slope, mid slope, and bottomland positions (Fresh-Moist).</li> <li>Young to Mid-age Community.</li> </ul>	NAR13, NSG3

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Comments	LGL Polygon Reference
FOD7-3	Fresh - Moist Willow Lowland Deciduous Forest	Canopy: Black willow ( <i>Salix nigra</i> ) is dominant with black cherry and Manitoba maple as associates. Subcanopy: Manitoba maple is dominant with black cherry, Drummond's dogwood, red ash and white mulberry as associates. Understorey: Common buckthorn, gray dogwood, and Tartarian honeysuckle are dominant with American elm, Black walnut, choke cherry, inserted Virginia-creeper, multiflora rose, nannyberry ( <i>Viburnum lentago</i> ), riverbank grape, prairie rose, red ash, red currant ( <i>Ribes rubrum</i> ) and staghorn sumac as associates. Ground Layer: Awnless brome ( <i>Bromus inermis</i> ssp. <i>inermis</i> ), Canada goldenrod, Canada thistle ( <i>Cirsium arvense</i> ), Common dandelion, inserted Virginia-creeper, Manitoba maple, orchard grass, upright yellow wood-sorrel ( <i>Oxalis stricta</i> ), wild parsnip ( <i>Pastinaca sativa</i> ) and yellowish enchanter's nightshade.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Lowland deciduous forest (7), dominated by Black Willow (-3).</li> <li>Sand, loam and clay soils that are poorly drained, in lower slope, mid slope, and bottomland positions (Fresh-Moist).</li> <li>Mature Community.</li> </ul>	LAM4A
FOD7-4	Fresh - Moist Black Walnut Lowland Deciduous Forest	Canopy: Black walnut is dominant with American elm, black cherry, black locust, common hackberry ( <i>Celtis</i> <i>occidentalis</i> ), eastern cottonwood, Manitoba maple, silver poplar ( <i>Populus alba</i> ) and freeman's maple as associates. <b>Subcanopy:</b> Black cherry, black walnut, common hackberry, Manitoba maple and white mulberry. <b>Understorey:</b> Black cherry, gray dogwood and Manitoba maple are dominant with amur honeysuckle ( <i>Lonicera</i> <i>maackii</i> ), black locust, choke cherry, common elderberry ( <i>Sambucus canadensis</i> ), common hackberry, narrow- leaved crabapple, poison-ivy, prairie rose, riverbank grape, sassafras, freeman's maple, Tartarian honeysuckle, thimble-berry and tree-of-heaven as associates. <b>Ground Layer:</b> Garlic mustard, lily-of-the-valley and inserted Virginia-creeper are dominant with Canada anemone ( <i>Anemone canadensis</i> ), cleavers, common burdock ( <i>Arctium minus</i> ssp. <i>minus</i> ), common motherwort ( <i>Leonurus cardiaca</i> ssp. <i>cardiaca</i> ), hound's-tongue ( <i>Cynoglossum officinale</i> ), Philadelphia fleabane ( <i>Erigeron</i> <i>philadelphicus</i> ssp. <i>philadelphicus</i> ), riverbank grape, scarlet strawberry, star-flowered Solomon's seal ( <i>Maianthemum</i> <i>stellatum</i> ), upright yellow wood-sorrel, white avens ( <i>Geum</i> <i>canadense</i> ) and yellow avens as associates.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Lowland deciduous forest (7), dominated by Black Walnut (-4).</li> <li>Sand, loam and clay soils that are poorly drained, in lower slope, mid slope, and bottomland positions (Fresh-Moist).</li> <li>Mid-age Community.</li> </ul>	BBA2, BBA13

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Comments	LGL Polygon Reference
FOD8	Fresh - Moist Poplar- Sassafras Deciduous Forest	Canopy: Eastern cottonwood is dominant with abundant pin oak and freeman's maple with some black cherry, black oak, red ash, red oak and white oak. Subcanopy: Manitoba maple and red ash are dominant with black cherry, black willow, peach-leaved willow ( <i>Salix amygdaloides</i> ), pin oak, sassafras, freeman's maple and white mulberry as associates. Understorey: Gray dogwood, black cherry and Manitoba maple are dominant with black willow, choke cherry, common buckthorn, Drummond's dogwood, nannyberry, red ash, sassafras and wild black currant ( <i>Ribes americanum</i> ) as associates. Ground Layer: Canada bluegrass, Canada goldenrod, common reed, garlic mustard, inserted Virginia-creeper, Pennsylvania sedge, riverbank grape, spotted crane's bill and yellowish enchanter's nightshade.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Dominated by Poplars and Sassafras (8).</li> <li>Sand, loam and clay soils that are poorly drained, in lower slope, mid slope, and bottomland positions (Fresh-Moist).</li> <li>Young to Mature Community.</li> </ul>	MAL1B, NAR3A, NAR6A, NAR6B, NSG6, NSG10, OAK2
FOD8-1	Fresh - Moist Poplar Deciduous Forest	Canopy: Eastern cottonwood is dominant with American elm, Manitoba maple and trembling aspen ( <i>Populus</i> <i>tremuloides</i> ) as associates. Subcanopy: Gray dogwood and Manitoba maple are dominant. Understorey: American hazel, black cherry, choke cherry, common buckthorn, gray dogwood, Manitoba maple, prairie rose and red ash. Ground Layer: Common dandelion, inserted Virginia- creeper, old-field cinquefoil ( <i>Potentilla simplex</i> ), sensitive fern, yellow trout lily and yellowish enchanter's nightshade.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Dominated by Poplars (8-1).</li> <li>Sand, loam and clay soils that are poorly drained, in lower slope, mid slope, and bottomland positions (Fresh-Moist).</li> <li>Young Community.</li> </ul>	HCL2, NAR8, NAR9
FOD8-2	Fresh - Moist Sassafras Deciduous Forest	Canopy: Sassafras is dominant with black cherry, eastern cottonwood and pin oak. Subcanopy: Black cherry and sassafras are dominant. Understorey: Black cherry, choke cherry, common buckthorn and sassafras. Ground Layer: Cleavers, inserted Virginia-creeper, rose twisted-stalk, sessile-leaved bellwort ( <i>Uvularia sessilifolia</i> ), spotted crane's bill, wild columbine ( <i>Aquilegia canadensis</i> ) and yellow trout lily.	<ul> <li>Tree cover &gt; 60 % (FO).</li> <li>Deciduous trees &gt; 75 % of canopy cover (D).</li> <li>Dominated by Sassafras (8-2).</li> <li>Sand, loam and clay soils that are poorly drained, in lower slope, mid slope, and bottomland positions (Fresh-Moist).</li> <li>Young Community.</li> </ul>	HCL1A, HCL10

## SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

#### ELC Vegetation LGL Polygon Comments Species Association Code Туре Reference FOD9 Fresh -Canopy: Eastern cottonwood, pin oak and freeman's Tree cover > 60 % (FO). NAR7, Moist Oak maple are dominant with black cherry, black oak and red Deciduous trees > 75 % NAR10, Maple oak. of canopy cover (D). NAR11. Dominated by Oak and Hickory Subcanopy: American elm, black cherry, Manitoba maple, NAR20. Deciduous red ash and white mulberry. Maple (9). NSG12 Forest Understorey: American hazel, black cherry, gray dogwood Sand, loam and clay and multiflora rose. soils that are poorly drained, in lower slope, Ground Layer: Inserted Virginia-creeper, Pennsylvania sedge, prickly raspberry, riverbank grape and yellowish mid slope, and enchanter's nightshade. bottomland positions (Fresh-Moist). Young to Mid-age Community. Terrestrial/Cultural CULTURAL PLANTATION CUP CUP1-8 Red Oak Canopy: Red oak is dominant with freeman's maple as a Cultural communities NAR3B Deciduous secondary. (CU). Plantation Subcanopy: Red Oak is dominant. Planted tree cover > Understorey: Gray dogwood and red ash are co-dominant. 60% (P). Ground Layer: Kentucky bluegrass, choke cherry and Deciduous trees > 75% creeping Charlie (Glechoma hederacea) are dominant. of canopy cover (1), dominated by Red Oak (-8). Mid-age community. CUP3 Coniferous Canopy: Eastern white cedar (Thuja occidentalis) is Cultural communities NCH5 Plantation dominant with eastern white pine (Pinus strobus) and red (CU). Planted tree cover > ash as associates. Understorey: Red ash and riverbank grape are co-60% (P). Coniferous trees > 75% dominant. Ground Cover: Field horsetail (Equisetum arvense) is of canopy cover (3). Young community. dominant. CUP3-3 Canopy: Scotch pine (Pinus sylvestris) is dominant with Scotch Pine Cultural communities NAR2 Coniferous Manitoba maple, black oak and eastern cottonwood as (CU). Planted tree cover > Plantation associates. Subcanopy: Black cherry, red ash and common crabapple 60% (P). (Malus pumila). Coniferous trees > 75% Understorey: Red ash, American hazel and gray dogwood. of canopy cover (3), Ground Cover: Field horsetail is dominant. dominated by Scotch Pine (-3). Young community.

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Comments	LGL Polygon Reference
CUM	CULTURAL M	EADOW	I	
CUM1-1	Dry - Moist Old Field Meadow	<b>Canopy:</b> Wild carrot, common reed, tall goldenrod, orchard grass, Canada goldenrod, Kentucky bluegrass, Canada thistle, ribgrass ( <i>Plantago lanceolata</i> ), common St. John'swort ( <i>Hypericum perforatum</i> ), common yarrow ( <i>Achillea millefolium</i> ssp. <i>millefolium</i> ), white heath aster white sweet-clover ( <i>Melilotus alba</i> ), wild bergamot, Canada bluegrass common motherwort ( <i>Leonurus cardiaca</i> ssp. <i>cardiaca</i> ), creeping Charlie, garlic mustard, awnless brome, common dandelion, field horsetail, ironweed, prickly raspberry, quack grass ( <i>Elymus repens</i> ), scarlet strawberry, sensitive fern ( <i>Onoclea sensibilis</i> ) and shepherd's purse ( <i>Capsella bursa-pastoris</i> ).	<ul> <li>Cultural communities (CU).</li> <li>Tree cover and shrub cover &lt; 25% (M).</li> <li>Parent mineral material or mineral soils (1).</li> <li>This community can occur on a wide range of soil moisture regimes (Dry-Moist) (-1).</li> <li>Pioneer community resulting from, or maintained by, anthropogenic-based influences.</li> </ul>	BBA3A, BBA4E, BBA4E, BBA4E, BBA4F, BBA4G, BBA4J, BBA4J, BBA4J, BBA4K, BBA4K, BBA4K, BBA4K, BBA4K, BBA4K, BBA4K, BBA4S, BBA5, BBA7B, BBA8B, BBA16B, HCL7, HCL9, HWY1, HWY5, LAM4F, LAM4G, MAL1A, MAL3C, MAL8, NAR4C, NCH2A, NCH2A, NCH2B, NCH2C, NCH2D, NCH4A, NCH4Y, NSG7, OAK1A, RED2B, RED10, RED11, RED15, YWK3, YWK3A, YWK3A,
CUT	CULTURAL TI	HICKET	L	,
CUT1	Mineral Cultural Thicket	Canopy: Eastern cottonwood, red ash, American elm, freeman's maple, Cockspur thorn ( <i>Crataegus crus-gall</i> ) and pin oak. Understorey: Gray dogwood, staghorn sumac, common buckthorn, Manitoba maple, red ash, riverbank grape, silky dogwood and Tartarian honeysuckle. Ground Cover: Scarlet strawberry, Canada goldenrod, common dandelion, garlic mustard and sensitive fern.	<ul> <li>Cultural communities (CU).</li> <li>Tree cover &lt;= 25%; shrub cover &gt; 25% (T).</li> <li>Parent mineral material or mineral soils (1).</li> <li>Young community resulting from, or maintained by, anthropogenic-based influences.</li> </ul>	BBA17, ESA3, ESA4, HWY4, NAR1, NAR3C, NAR5, NAR17, NAR19, NCH1B, NCH1C, NCH1E, NCH1E, NCH1F, NCH12, NSG1, NSG11, RED3, RED13

#### SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

#### ELC Vegetation LGL Polygon Comments Species Association Code Туре Reference CUT1-4 Gray Canopy: Eastern cottonwood, red ash, pin oak, American Cultural communities BBA3, HCL3, HCL6, NAR6C, Dogwood elm and freeman's maple. (CU). Understorey: Gray dogwood is dominant with staghorn Cultural Tree cover $\leq 25\%$ : Thicket sumac and Drummond's dogwood as associates. shrub cover > 25% (T). NCH1A. Ground Cover: Common reed, common cinquefoil Parent mineral material NCH1G, (Potentilla canadensis) and wild carrot. or mineral soils (1), NSG2 dominated by Gray Dogwood (-4). Young community resulting from, or maintained by, anthropogenic-based influences. CUS CULTURAL SAVANNAH CUS1 Cultural communities BBA1, BBA1B, Mineral Canopy: Manitoba maple, black walnut, eastern Cultural cottonwood, freeman's maple, tree-of-heaven (Ailanthus (CU). BBA4B, altissima) and white mulberry. 25% < Tree Cover <= BBA4C, Savannah BBA4D, Understorey: Manitoba maple, Tartarian honeysuckle, 35% (S). Drummond's dogwood, gray dogwood, prairie rose, Parent mineral material BBA4L, Siberian elm, American elm, red ash and staghorn sumac. or mineral soils (1). BBA4N, Ground Cover: Orchard grass, wild carrot, common Young community BBA4P, mullein (Verbascum thapsus), common reed, white clover resulting from, or BBA4R, (Trifolium repens), awnless brome, Canada goldenrod, maintained by, LAM3, MAL6, catnip (Nepeta cataria), common heal-all, inserted Virginiaanthropogenic-based NCH7, NCH7G, creeper, tall goldenrod and white heath aster. influences. NCH7J, NSG5 CUS1-1 Cultural communities Hawthorn Canopy: Eastern cottonwood is dominant with Manitoba MAL3 Mineral maple, red ash and black locust as associates. (CU). **Understorey:** Staghorn sumac is dominant with gray 25% < Tree Cover <= Cultural dogwood, cockspur thorn and eastern cottonwood as 35% (S). Savannah Parent mineral material associates. or mineral soils (1), Ground Cover: Common reed and Kentucky bluegrass are co-dominant with tall fescue, white sweet-clover, tall dominated by hawthorn goldenrod and Orchard grass as associates. and a mixture of other woody plants. Young community resulting from, or maintained by, anthropogenic-based influences.

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Comments	LGL Polygon Reference					
CUW	CULTURAL W	CULTURAL WOODLAND							
CUW1	Mineral Cultural Woodland	Canopy: Eastern cottonwood, freeman's maple, Manitoba maple, red ash, American elm, black cherry, black locust, black oak, pin oak, Siberian elm, silver maple ( <i>Acer saccharinum</i> ), tree-of-heaven, weeping willow ( <i>Salix X sepulcralis</i> ) and white mulberry. Subcanopy: Manitoba maple, red ash, American elm, Drummond's dogwood, freeman's maple and white mulberry. Understorey: Black cherry, gray dogwood, white mulberry, common buckthorn, red ash, American elm, common crabapple, eastern red cedar, guelder rose ( <i>Viburnum opulus</i> ), Japanese barberry ( <i>Berberis thunbergil</i> ), Manitoba maple, multiflora rose, nannyberry ( <i>Viburnum lentago</i> ), prairie rose, riverbank grape, Siberian elm, silky dogwood, staghorn sumac, Tartarian honeysuckle and thimble-berry. Ground Cover: Garlic mustard, common reed, inserted Virginia-creeper, yellowish enchanter's nightshade, calico aster, Canada bluegrass, Canada goldenrod, common dandelion, Indian hemp ( <i>Apocynum cannabinum</i> var. <i>cannabinum</i> ), Kentucky bluegrass, many-flowered agrimony, old-field cinquefoil, orchard grass, scarlet strawberry, sensitive fern, spotted crane's-bill, tall goldenrod, tall hairy agrimony ( <i>Agrimonia gryposepala</i> ), wild carrot and yellow avens.	<ul> <li>Cultural communities (CU)</li> <li>35% &lt; Tree Cover &lt;= 60% (W).</li> <li>Parent mineral material or mineral soils (1).</li> <li>Young community resulting from, or maintained by, anthropogenic-based influences.</li> </ul>	ABO1, BBA4A, BBA4JB, BBA5B, BBA6, BBA9, BBA16, HCL1, HWY2, LAM2, LAM4B, LAM4D, LAM4E, LAM5, LAM6, LAM5, LAM6, LAM7, MAL1C MAL12, , NAR3D, NAR14, NCH1, NCH1D, NCH3A, NCH7E, NCH7F					

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC	Vegetation	Species Association	Comments	LGL Polygon
Wetland	туре			Relefence
SWD	DECIDUOUS	SWAMP		
SWD1-3	Pin Oak Mineral Deciduous Swamp	Canopy: Pin oak is dominant with abundant eastern cottonwood with some American elm, big shellbark hickory, black cherry, black oak, bur oak, Manitoba maple, red ash, shumard oak ( <i>Quercus shumardii</i> ), freeman's maple, swamp white oak, trembling aspen and white oak. <b>Subcanopy:</b> Pin oak is dominant with American elm, Manitoba maple, red ash, freeman's maple and swamp white oak as associates. <b>Understorey:</b> American hazel, big shellbark hickory ( <i>Carya laciniosa</i> ), black cherry, choke cherry, common buckthorn, gray dogwood, Manitoba maple, narrow-leaved crabapple and red ash. <b>Ground Cover:</b> Eastern cottonwood seedlings, inserted Virginia-creeper, marsh fern, Pennsylvania sedge, prickly raspberry, sensitive fern, spotted crane's bill, western poison-ivy, wood anemone, yellowish enchanter's nightshade and yellow trout lily.	<ul> <li>Standing water &gt;20% of ground coverage dominated by hydrophytic shrub and tree species (SW).</li> <li>Tree cover &gt; 25% with deciduous tree species &gt; 75% of canopy cover (D).</li> <li>Mineral soil (1).</li> <li>Pin Oak is dominant (-3).</li> </ul>	HCL5, RED2. RED4, RED8
SWD3-3	Freeman's Maple Mineral Deciduous Swamp	Canopy: Eastern cottonwood and freeman's maple are dominant with American basswood, American elm, black cherry, Manitoba maple, pin oak, red ash and trembling aspen as associates. Subcanopy: Swamp maple is dominant with American elm, Manitoba maple, pin oak and red ash as associates. Understorey: Red ash, silky dogwood and freeman's maple are dominant with Black cherry, common buckthorn, gray dogwood, guelder rose, Manitoba maple, Russian olive and staghorn sumac as associates. Ground Layer: Common reed, garlic mustard, inserted Virginia-creeper, riverbank grape, sensitive fern and wood anemone are dominant.	<ul> <li>Standing water &gt;20% of ground coverage dominated by hydrophytic shrub and tree species (SW).</li> <li>Tree cover &gt; 25% with deciduous tree species &gt; 75% of canopy cover (D).</li> <li>Mineral soil (3).</li> <li>Freeman's Maple is dominant (-3).</li> </ul>	MAL10, NCH3, NCH3B, NSG8, OAK2A, RED6, RED7
MAM	MEADOW MA	ARSH		
MAM2	Mineral Meadow Marsh	Canopy: Common reed is dominant with broad-leaved cattail ( <i>Typha latifolia</i> ), gray dogwood, Manitoba maple, narrow-leaved cattail (Typha angustifolia) and riverbank grape as associates. Ground Cover: Common barnyard grass ( <i>Echinochloa</i> <i>crusgalli</i> ), eastern cottonwood, hairy aster ( <i>Aster pilosus</i> var. pilosus), Indian hemp, ironweed, Philadelphia fleabane, riverbank grape, small-spiked barnyard grass ( <i>Echinochloa</i> <i>microstachya</i> ), straw-colored umbrella sedge ( <i>Cyperus</i> <i>strigosus</i> ), tall goldenrod, Torrey's rush ( <i>Juncus torreyi</i> ), tree-of-heaven and white heath aster.	<ul> <li>Seasonally flooded and is dominated by emergent hydrophytic macrophytes (MAM).</li> <li>Represents the wetland – terrestrial interface.</li> <li>Tree and shrub cover &lt;= 25%.</li> <li>Mineral soil (2), dominated by common reed.</li> <li>Community age pioneer.</li> </ul>	BBA10, HCL4, MAL2, MAL7, NAR6D, NAR18, RED14, YWK7

# SUMMARY OF ECOLOGICAL LAND CLASSIFICATION<sup>1</sup> VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Comments	LGL Polygon Reference			
MAM2- 10	Forb Mineral Meadow Marsh	<b>Canopy:</b> European beggar-ticks ( <i>Bidens tripartita</i> ) is dominant with abundant devil's beggar-ticks ( <i>Bidens frondosa</i> ), spotted touch-me-not ( <i>Impatiens capensis</i> ) and tumor-curing cocklebur ( <i>Xanthium strumarium</i> ) as associates.	<ul> <li>Seasonally flooded and is dominated by emergent hydrophytic macrophytes (MAM).</li> <li>Represents the wetland – terrestrial interface.</li> <li>Tree and shrub cover &lt;= 25%.</li> <li>Mineral soil (2), dominated by forbs (- 10).</li> <li>Community age pioneer.</li> </ul>	BBA15			
MAS	SHALLOW MARSH						
MAS2-1	Cattail Mineral Shallow Marsh	<b>Canopy:</b> Narrow-leaved cattail is dominant with calico aster, Canada thistle, field sow-thistle ( <i>Sonchus arvensis</i> ssp. <i>arvensis</i> ), fowl meadow grass ( <i>Poa palustris</i> ), orchard grass and tumor-curing cocklebur as associates.	<ul> <li>Standing or flowing water for much of the growing season and hydrophytic emergent macrophyte cover &gt;25 % (MAS).</li> <li>Tree and shrub cover &lt;= 25%.</li> <li>Mineral soil (2).</li> <li>Narrow-leaved Cattail is dominant (-1).</li> <li>Community age pioneer.</li> </ul>	HCL8, YWK9			
OAO	OPEN AQUA	TIC	I				
OAO	Open Aquatic	Ground Cover: Not applicable	<ul> <li>No Macrophyte vegetation, trees, or shrub cover.</li> <li>Water Depth &gt; 2m</li> </ul>	HWY3			

APPENDIX D

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
ABO1	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	38,60
ANS1	TPW2-1	Fresh-Moist Black Oak-White Oak Tallgrass Woodland	G2	S1	12	8,22,30,32,35,37, 39,48,52,55,60,62
ANS1A	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	4	8,9,16,35
ANS2	TPW2-2	Fresh-Moist Pin Oak Tallgrass Woodland	G1	S1	13	13,22,26,30, 32,37,39,42, 44,45,48,55,60
ANS2C	TPW2-1	Fresh-Moist Black Oak-White Oak Tallgrass Woodland	G2	S1	17	13,22,27,30,32,35,37, 39,42,44,45,47, 48,55,58,60,62
BBA1	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	5	3,14,38,39,60
BBA1A	FOD4	Dry-Fresh Deciduous Forest Ecosite	not ranked	not ranked	0	
BBA1B	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	0	
BBA2	FOD7-4	Fresh-Moist Black Walnut Lowland Deciduous Forest	G4?	S2S3	1	48
BBA3	CUT1-4	Gray Dogwood Cultural Thicket	not ranked	not ranked	0	
BBA3A	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
BBA4A	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	60
BBA4B	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	3	3,7,60
BBA4C	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	2	3,60
BBA4D	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	3	3,25,60
BBA4E	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	1	60
BBA4EB	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	1	60
BBA4EC	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	5	3,7,30,38,60
BBA4F	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	8	20,25,37-39,52,57,60
BBA4G	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked		
BBA4H	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked		

# APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

<sup>&</sup>lt;sup>1</sup> Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Sciences Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. North Bay, Ontario.

<sup>&</sup>lt;sup>2</sup> Numbers correspond with the species number listed in Table 2 of the main report.

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
BBA4I	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked		
BBA4J	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked		
BBA4JB	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked		
BBA4K	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked		
BBA4L	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked		
BBA4N	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked		
BBA4P	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked		
BBA4R	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked		
BBA4S	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	1	25
BBA4M	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	2	52,60
BBA4MB	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	5	30,37,38,52,60
BBA5	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
BBA5B	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
BBA6	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
BBA7	FOD4	Dry-Fresh Deciduous Forest Ecosite	not ranked	not ranked	1	48
BBA7B	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
BBA8	FOD4	Dry-Fresh Deciduous Forest Ecosite	not ranked	not ranked	0	
BBA8B	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
BBA9	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
BBA10	MAM2	Mineral Meadow Marsh Ecosite	not ranked	not ranked	1	3
BBA12	FOD4	Dry-Fresh Deciduous Forest Ecosite	not ranked	not ranked	1	48
BBA13	FOD7-4	Fresh-Moist Black Walnut Lowland Deciduous Forest	G4?	S2S3	1	48
BBA14	FOD4	Dry-Fresh Deciduous Forest Ecosite	not ranked	not ranked	2	25,48
BBA15	MAM2- 10	Forb Mineral Meadow Marsh	G5?	S5	0	
BBA16	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not	1	3

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
				ranked		
BBA16B	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	1	3
BBA17	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	2	35,55
ESA1	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	4	37,38,57,60
ESA2	FOD2-2	Dry-Fresh Oak-Hickory Deciduous Forest	G4?	S3S4	5	16,25,37,39,55
ESA3	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	9	8,11,17,30,39, 52,55,57,60
ESA4	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	7	8,11,30,39,55,57,60
ESA5	TPS2-1	Fresh-Moist Pin Oak-Bur Oak Tallgrass Savannah	G1	<u>S1</u>	10	2,11,17,22,30, 37,39,55,57,60
HCL1	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	39
HCL1A	FOD8-2	Fresh-Moist Sassafras Deciduous Forest	not ranked	not ranked	1	55
HCL2	FOD8-1	Fresh-Moist Poplar Deciduous Forest	not ranked	not ranked	1	48
HCL3	CUT1-4	Gray Dogwood Cultural Thicket	not ranked	not ranked	10	8,17,30,37,39, 43,52,55,57,60
HCL4	MAM2	Mineral Meadow Marsh Ecosite	not ranked	not ranked	3	22,52,60
HCL5	SWD1-3	Pin Oak Mineral Deciduous Swamp	G2	S2S3	3	39,55,57
HCL6	CUT1-4	Gray Dogwood Cultural Thicket	not ranked	not ranked	8	11,17,22,38, 39,55,57,60
HCL7	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
HCL8	MAS2-1	Cattail Mineral Shallow Marsh	G5	S5	1	18
HCL9	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	1	22
HCL10	FOD8-2	Fresh-Moist Sassafras Deciduous Forest	not ranked	not ranked	1	55
HWY1	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	4	22,39,52,60
HWY2	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
HWY3	OAO	Open Aquatic	NA	S5	0	
HWY4	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	0	
HWY5	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
LAM1	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	18	3,8,11,18,22,28, 30,32,35,37-39, 46,49,54,58-60
LAM2	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	11	8,11,18,22,30,37, 39,50,55,57,60

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
LAM3	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	6	18,39,42,55,58,60
LAM4A	FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest	not ranked	not ranked	0	
LAM4B	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	18,22
LAM4D	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	6	13,18,22,39,48,55
LAM4E	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
LAM4F	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
LAM4G	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
LAM5	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	39,55
LAM6	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
LAM7	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	39,55
MAL1	FOD1-4	Dry-Fresh Mixed Oak Deciduous Forest	G?	S3S4	6	22,37,44,49,53,55
MAL1A	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
MAL1B	FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite	not ranked	not ranked	5	21,22,30,37,55
MAL1C	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
MAL1D	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	7	24,38,39,52, 57,59,60
MAL1E	FOD1-4	Dry-Fresh Mixed Oak Deciduous Forest	G?	S3S4	2	21,55
MAL2	MAM2	Mineral Meadow Marsh Ecosite	not ranked	not ranked	0	
MAL3	CUS1-1	Hawthorn Cultural Savannah	not ranked	not ranked	7	22,30,37,39, 49,52,60
MAL3B	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	10	3,14,18,22,30, 37,39,49,52,60
MAL3C	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	1	39
MAL5	FOD4	Dry-Fresh Deciduous Forest Ecosite	not ranked	not ranked	1	48
MAL6	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	0	
MAL7	MAM2	Mineral Meadow Marsh Ecosite	not ranked	not ranked	0	
MAL8	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
MAL9	FOD1-3	Dry-Fresh Black Oak Deciduous Forest	G4?	S3	5	22,35,37,39,55
MAL10	SWD3-3	Freeman's Maple Mineral Deciduous	not ranked	not	5	22,35,37,39,55

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
		Swamp		ranked		
MAL11	FOD1-3	Dry-Fresh Black Oak Deciduous Forest	G4?	S3	5	22,35,37,39,55
MAL12	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	38,60
NAR1	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	10	4,14,22,30,38, 49,51,55,59,60
NAR2	CUP3-3	Scotch Pine Coniferous Plantation	not ranked	not ranked	0	
NAR3A	FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite	not ranked	not ranked	2	39,55
NAR3B	CUP1-8	Red Oak Deciduous Plantation	not ranked	not ranked	0	
NAR3C	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	0	
NAR3D	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	55
NAR4A	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	10	4,14,22,30, 37- 39,49,52,60
NAR4B	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	7	4,14,22,30,37,52,60
NAR4C	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	10	4,6,9,14,22, 30,32,37,52,60
NAR5	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	2	1,55
NAR6A	FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite	not ranked	not ranked	1	55
NAR6B	FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite	not ranked	not ranked	1	55
NAR6C	CUT1-4	Gray Dogwood Cultural Thicket	not ranked	not ranked	1	55
NAR6D	MAM2	Mineral Meadow Marsh Ecosite	not ranked	not ranked	2	34,52
NAR7	FOD9	Fresh-Moist Oak-Maple-Hickory Deciduous Forest Ecosite	not ranked	not ranked	0	
NAR8	FOD8-1	Fresh-Moist Poplar Deciduous Forest	not ranked	not ranked	1	36
NAR9	FOD8-1	Fresh-Moist Poplar Deciduous Forest	not ranked	not ranked	0	
NAR10	FOD9	Fresh-Moist Oak-Maple-Hickory Deciduous Forest Ecosite	not ranked	not ranked	1	55
NAR11	FOD9	Fresh-Moist Oak-Maple-Hickory Deciduous Forest Ecosite	not ranked	not ranked	0	
NAR12	FOD7-1	Fresh-Moist White Elm Lowland Deciduous Forest	not ranked	not ranked	4	10,37,39,55
NAR13	FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest	not ranked	not ranked	0	
NAR14	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	3	22,37,39

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION
LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
NAR15	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	13	4,5,9,10,14,22,30, 37,38,49,55,59,60
NAR16	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	13	5,9,10,14,22,30,37- 39,49,55,59,60
NAR17	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	1	55
NAR18	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	not ranked	not ranked	0	
NAR19	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	4	9,39,55,60
NAR20	FOD9	Fresh-Moist Oak-Maple-Hickory Deciduous Forest Ecosite	not ranked	not ranked	1	55
NCH1	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	39
NCH1A	CUT1-4	Gray Dogwood Cultural Thicket	not ranked	not ranked	5	4,5,39,49,55
NCH1B	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	5	4,5,39,49,55
NCH1C	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	5	4,5,39,49,55
NCH1D	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	5	9,22,37,39,55
NCH1E	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	1	57
NCH1F	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	2	39,55
NCH1G	CUT1-4	Gray Dogwood Cultural Thicket	not ranked	not ranked	2	39,55
NCH2A	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	4	5,37,39,60
NCH2B	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	7	9,15,22,24,35,55,60
NCH2C	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	3	22,30,60
NCH2D	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	2	39,55
NCH2E	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	6	1,4,14,15,22,30
NCH3	SWD3-3	Freeman's Maple Mineral Deciduous Swamp	not ranked	not ranked	1	39
NCH3A	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
NCH3B	SWD3-3	Freeman's Maple Mineral Deciduous Swamp	not ranked	not ranked	0	
NCH4A	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	2	39,60
NCH4B	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	12	2,4,14,15,22,27, 30,37-39,59,60
NCH4Y	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not	3	27,39,60

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
				ranked		
NCH4Z	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	10	4,14,15,22,30,37- 39,59,60
NCH5	CUP3	Coniferous Plantations	not ranked	not ranked	0	
NCH7	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	2	39,59
NCH7B	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	55
NCH7C	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	55
NCH7D	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
NCH7E	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	18,22
NCH7F	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	4	9,22,39,59
NCH7G	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	0	
NCH7H	FOD4	Dry-Fresh Deciduous Forest Ecosite not ranked ranked			1	39
NCH7J	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	2	39,55
NCH8	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	39,48
NCH11	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	39,55
NCH12	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	13	1,5,6,14,15,19,22, 29,30,37,49,52,60
NCH12B	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	7	15,18,22,30, 32,37,52,
NGM1	FOD4	Dry-Fresh Deciduous Forest Ecosite	not ranked	not ranked	5	23,55,59-61
NGM2	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	5	23,55,59-61
NGM3	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	38,60
NSG1	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	2	39,55
NSG2	CUT1-4	Gray Dogwood Cultural Thicket	not ranked	not ranked	3	11,22,39
NSG3	FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest	not ranked	not ranked	2	39,55
NSG4	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
NSG5	CUS1	Mineral Cultural Savannah Ecosite	not ranked	not ranked	9	22,30,37- 39,49,53,55,60
NSG6	FOD8	Fresh-Moist Poplar-Sassafras Deciduous	not ranked	not	1	55

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
		Forest Ecosite		ranked		
NSG7	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	3	30,38,60
NSG7A	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	3	30,38,60
NSG7B	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	55
NSG7C	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	3	30,38,60
NSG8	SWD3-3	Freeman's Maple Mineral Deciduous Swamp	not ranked	not ranked	1	55
NSG10	FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite	not ranked	not ranked	1	55
NSG11	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	3	22,39,55
NSG12	FOD9	Fresh-Moist Oak-Maple-Hickory Deciduous Forest Ecosite	not ranked	not ranked	1	55
NSG13	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	38,55
NSG14	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	38,60
NSG15	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
OAK1A	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	7	9,14,22,30,32,52,60
OAK1B	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	9	4,21,23,30,39, 52,55,57,60
OAK2	FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite	not ranked	not ranked	5	22,39,48,55,60
OAK2A	SWD3-3	Freeman's Maple Mineral Deciduous Swamp	not ranked	not ranked	1	23
OAK2B	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	1	60
OAK2C	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	2	22,39
OAK3	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	5	1,14,30,32,33
OAK4	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	0	1,14,30,32,33
RED2	SWD1-3	Pin Oak Mineral Deciduous Swamp	G2	S2S3	7	22,36,39,41,55-57
RED2A	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	3	1,39,56
RED2B	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	4	1,9,15,55
RED3	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	3	22,59,60
RED4	SWD1-3	Pin Oak Mineral Deciduous Swamp	G2	S2S3	5	22,39,45,55,56
RED5	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	4	22,30,39,60
RED6	SWD3-3	Freeman's Maple Mineral Deciduous Swamp	not ranked	not ranked	0	

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

LGL ID	ELC Code	ELC Description	Grank	Srank	# of S1-S3	S1-S3 Plant Species Identifier <sup>2</sup>
RED7	SWD3-3	Freeman's Maple Mineral Deciduous Swamp	not ranked	not ranked	5	18,37,39,55,60
RED8	SWD1-3	Pin Oak Mineral Deciduous Swamp	G2	S2S3	7	18,22,37,39, 44,55,56
RED9	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	0	
RED10	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
RED11	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
RED12	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	9	8,14,15,19, 22,30,39,52,60
RED13	CUT1	Mineral Cultural Thicket Ecosite	not ranked	not ranked	9	8,14,15,19,22, 30,39,52,60
RED14	MAM2	Mineral Meadow Marsh Ecosite	not ranked	not ranked	2	52,60
RED15	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
YWK1	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	11	4,22,30,32,37,39, 40,49,51,55,60
YWK1B	TPO2-1	Fresh-Moist Tallgrass Prairie	G2	S1	10	4,22,30,32,37,39, 40,49,51,60
YWK1C	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	11	4,22,30,32,37,39, 40,49,51,55,60
YWK2	FOD1-3	Dry-Fresh Black Oak Deciduous Forest	G4?	S3	4	22,48,55,60
YWK3	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	3	18,22,60
YWK3A	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	0	
YWK4	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	4	7,37,55,60
YWK5	CUW1	Mineral Cultural Woodland Ecosite	not ranked	not ranked	3	34,55,60
YWK6	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	1	34
YWK7	MAM2	Mineral Meadow Marsh Ecosite	not ranked	not ranked	2	55,60
YWK8	CUM1-1	Dry-Moist Old Field Meadow	not ranked	not ranked	3	7,37,60
YWK9	MAS2-1	Cattail Mineral Shallow Marsh	G5	S5	0	

APPENDIX D PROVINCIALLY RARE ELC VEGETATION COMMUNITIES<sup>1</sup> LOCATED IN THE AREA OF INVESTIGATION

Note: Shading indicates vegetation communities that are provincially rare.



Watercourse/ Waterbody Name	Reach Location	Agricultural Municipal Drain Classification (A, B, C, D, E, F)	Fish Community (warmwater, coolwater, coldwater, baitfish, sportfish, migratory)	Habitat Summary	Flow Conditions (ephemeral, intermittent, permanent)	Drainage Connectivity (obstructed, partially obstructed, unobstructed)	Habitat Class (marginal, important, critical)	Chann (cha channe na
Basin Drain	Upstream of E.C. Row	F	none	<ul> <li>piped upstream and downstream of Continental Drive</li> <li>open pooled water upstream of E.C. Row</li> <li>buried culvert?</li> </ul>	permanent	obstructed	none	cha
Basin Drain	Downstream of E.C. Row	F	warmwater baitfish	<ul> <li>ditched watercourse</li> <li>morphology – flats with small riffle and pools near Spring Garden Road</li> <li>width 2 m, depth 30 cm</li> <li>more shallow and diverse downstream</li> <li>sparse instream cover upstream, more downstream</li> <li>riparian vegetation – trees, shrubs and herbaceous vegetation</li> <li>substrate – muck</li> </ul>	permanent	unobstructed	marginal	cha
Benson Drain	Upstream of South Talbot Road	F	warmwater baitfish	<ul> <li>narrow ditched watercourse</li> <li>morphology – flats with dry areas</li> <li>width 0.5 m, depth 10 cm</li> <li>riparian vegetation – trees, shrubs, grasses and herbaceous vegetation</li> <li>good shade</li> <li>sparse instream cover</li> <li>substrate – clay</li> </ul>	intermittent	unobstructed	marginal	cha
Broadway Drain	Upstream of Sandwich Street	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> <li>riparian vegetation – cattails and <i>Phragmites</i></li> </ul>	intermittent	partially obstructed	marginal	cha
Broadway Drain	Downstream of Sandwich Street	F	warmwater	<ul> <li>seasonal ditched watercourse</li> <li>mostly dry – rip rap-lined pool at culvert receives warm effluent</li> <li>pool 2.5 m wide, 25 cm deep</li> <li>some channel definition</li> <li>riparian vegetation - cattails, <i>Phragmites</i> and trees</li> <li>channel accessible from Detroit River during high flows</li> </ul>	intermittent	partially obstructed	marginal	cha
Burke Drain	South Talbot Road to Talbot Road	F	warmwater sportfish	<ul> <li>pooled water in roadside ditch</li> <li>width 2 m, depth 15 cm</li> <li>riparian vegetation – cattails</li> <li>substrate – detritus and muck</li> </ul>	intermittent	partially obstructed	marginal	cha
Burke Drain	Downstream of South Talbot Road	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> </ul>	ephemeral	partially obstructed	none	cha
Cahill Drain	Upstream of confluence with Wolfe Drain	F	warmwater baitfish	<ul> <li>narrow ditched watercourse</li> <li>morphology – flats with some runs and riffles</li> <li>width 1.5 m, depth 20 cm</li> <li>sparse instream cover</li> <li>riparian vegetation – herbaceous vegetation and grasses</li> <li>substrate – clay</li> </ul>	permanent	unobstructed	marginal	cha

el Structure nnelized, elized lined, atural)	Comments
nnelized	
nnelized	<ul><li>Water does not appear to be flowing.</li><li>Water is pooled in a deep roadside ditch</li></ul>
nnelized	
nnelized	

Watercourse/ Waterbody Name	Reach Location	Agricultural Municipal Drain Classification (A, B, C, D, E, F)	Fish Community (warmwater, coolwater, coldwater, baitfish, sportfish, migratory)	Habitat Summary	Flow Conditions (ephemeral, intermittent, permanent)	Drainage Connectivity (obstructed, partially obstructed, unobstructed)	Habitat Class (marginal, important, critical)	Channe (cha channe na
Cahill Drain	Downstream of Talbot Road	E	warmwater sportfish	<ul> <li>ditched watercourse with some naturalization</li> <li>morphology – flats with some runs and pools</li> <li>width 4 m, depth 40 cm</li> <li>riparian vegetation – trees, shrubs, herbaceous vegetation and grasses</li> <li>substrate – muck</li> </ul>	permanent	unobstructed	important	cha
Collins Drain	Upstream of Confluence with Wolfe Drain	F	warmwater baitfish	<ul> <li>ditched watercourse</li> <li>morphology - flats</li> <li>width 1.5 m, depth 5 cm</li> <li>riparian vegetation – cattails and <i>Phragmites</i></li> <li>substrate – clay/silt</li> </ul>	intermittent	unobstructed	marginal	cha
Dickson Drain	Upstream of Confluence with Benson Drain	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> <li>riparian vegetation – cattails</li> </ul>	ephemeral	partially obstructed	none	cha
Dickson Drain	Downstream of South Talbot Road	F	warmwater baitfish	<ul> <li>narrow ditched watercourse</li> <li>morphology – flats with dry areas</li> <li>width 1 m, depth 10 cm</li> <li>riparian vegetation – trees, shrubs, grasses and herbaceous vegetation</li> <li>good shade</li> <li>sparse instream cover</li> <li>substrate – clay</li> </ul>	intermittent	unobstructed	marginal	cha
Grand Marais Drain (Turkey Creek)	Upstream of Huron Church Road	unclassified	warmwater sportfish	<ul> <li>concrete lined channel</li> <li>morphology - runs</li> <li>width 2.2 m, depth 25 cm</li> <li>very sparse instream cover</li> <li>no riparian vegetation</li> <li>substrate – silt and sand over concrete</li> </ul>	permanent	unobstructed	marginal	channeli
Grand Marais Drain (Turkey Creek)	Downstream of Huron Church Road	E	warmwater sportfish	<ul> <li>concrete lined channel</li> <li>morphology – runs with small riffles</li> <li>width 2.2 m, depth 25 cm</li> <li>sparse instream cover</li> <li>no riparian vegetation for 100 m, then old field vegetation</li> <li>substrate – silt and sand over concrete</li> </ul>	permanent	unobstructed	marginal	channeli
Healy Drain	Upstream of Sandwich Street	F	none	<ul> <li>roadside ditch</li> <li>obstructed by buried culvert</li> <li>some standing water</li> <li>lack of channel definition</li> <li>riparian vegetation – cattails and <i>Phragmites</i></li> </ul>	intermittent	obstructed	none	cha
Healy Drain	Downstream of Sandwich Street	F	warmwater	<ul> <li>seasonal ditched watercourse</li> <li>dry</li> <li>riparian vegetation – cattails and <i>Phragmites</i></li> <li>channel accessible from Detroit River during high flows</li> </ul>	intermittent	partially obstructed	marginal	cha
Howard Avenue Drain	Upstream of South Talbot Road	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> <li>riparian vegetation - cattails</li> </ul>	ephemeral	partially obstructed	none	cha

el Structure nnelized, lized lined, atural)	Comments
nnelized	
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zed concrete lined	
zed concrete lined	
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nnelized	

Watercourse/ Waterbody Name	Reach Location	Agricultural Municipal Drain Classification (A, B, C, D, E, F)	Fish Community (warmwater, coolwater, coldwater, baitfish, sportfish, migratory)	Habitat Summary	Flow Conditions (ephemeral, intermittent, permanent)	Drainage Connectivity (obstructed, partially obstructed, unobstructed)	Habitat Class (marginal, important, critical)	Chann (cha channe n
Lennon Drain	Upstream of Talbot Road	F	warmwater sportfish	<ul> <li>ditched watercourse</li> <li>morphology – flats</li> <li>width 2 m, depth 25 cm</li> <li>sparse instream cover</li> <li>riparian vegetation – manicured grass with some trees</li> <li>substrate – geotextile and clay</li> </ul>	permanent	unobstructed	important	cha
Lennon Drain	Talbot Road to Huron Church Line	E	warmwater sportfish	<ul> <li>ditched watercourse</li> <li>morphology – runs with few riffles</li> <li>width 1.5 m, depth 20 cm</li> <li>riparian vegetation – herbaceous vegetation, grasses, and few shrubs</li> <li>substrate – rip rap</li> <li>good instream cover</li> </ul>	permanent	unobstructed	important	channeliz
Lennon Drain	Downstream of Huron Church Line	E	warmwater sportfish	<ul> <li>ditched watercourse</li> <li>morphology – runs with few riffles</li> <li>width 1.5 m, depth 20 cm</li> <li>sparse instream cover</li> <li>riparian vegetation – manicured grass with some trees</li> <li>substrate - clay</li> </ul>	permanent	unobstructed	important	cha
Marentette Drain	Upstream of Huron Church Road	F	none	• Piped	intermittent	obstructed	none	cha
Marentette Drain	Downstream of Huron Church Road	F	none	<ul> <li>piped for ~60 m then open dry channel</li> <li>riparian vegetation – trees</li> <li>substrate – silt and detritus</li> </ul>	intermittent	obstructed	none	cha
McKee Drain	Upstream of Matchette Road	F	none	<ul> <li>piped upstream of Matchette Road across residential property</li> <li>open channel inaccessible to fish</li> <li>riparian vegetation – manicured grass</li> </ul>	intermittent	obstructed	none	cha
McKee Drain	Matchette Road to E.C. Row	F	warmwater sportfish	<ul> <li>ditched watercourse</li> <li>partially rip rap lined near E.C. Row</li> <li>morphology – flat</li> <li>width 1.5 m, depth 20</li> <li>less water near Matchette Road</li> <li>riparian vegetation – <i>Phragmites</i></li> <li>substrate – muck and detritus</li> </ul>	intermittent	unobstructed	important	cha
McKee Drain	Downstream of E.C. Row	F	warmwater sportfish	<ul> <li>ditched watercourse</li> <li>rip rap lined</li> <li>morphology - flat</li> <li>width 2 m, depth 20 cm</li> <li>riparian vegetation – <i>Phragmites</i></li> <li>substrate – muck and detritus</li> </ul>	intermittent	unobstructed	important	cha
McKee Creek	Upstream of Sandwich Street	F	warmwater sportfish	<ul> <li>ditched watercourse lined with sheet piling</li> <li>morphology – flat</li> <li>width 3 m, depth 15 cm</li> <li>riparian vegetation – old field with vines</li> <li>substrate – muck</li> </ul>	permanent	unobstructed	important	cha

el Structure nnelized, elized lined, atural)	Comments
nnelized	
ed rip rap lined	
nnelized	

Watercourse/ Waterbody Name	Reach Location	Agricultural Municipal Drain Classification (A, B, C, D, E, F)	Fish Community (warmwater, coolwater, coldwater, baitfish, sportfish, migratory)	Habitat Summary	Flow Conditions (ephemeral, intermittent, permanent)	Drainage Connectivity (obstructed, partially obstructed, unobstructed)	Habitat Class (marginal, important, critical)	Chann (cha channe n
McKee Creek	Downstream of Sandwich Street	E	warmwater sportfish	<ul> <li>ditched watercourse flows downstream of sandwich street into a canal on Van De Hogen property</li> <li>morphology – flat</li> <li>width 4 m, depth 25 cm</li> <li>riparian vegetation – <i>Phragmites</i></li> <li>substrate – muck and silt</li> </ul>	permanent	partially obstructed	important	cha
NoName Tributary of Dickson Drain along South Talbot Road	Upstream of Confluence with Dickson Drain	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> <li>riparian vegetation - cattails</li> </ul>	ephemeral	partially obstructed	none	cha
NoName Tributary of Susan Drain along Broadway Street	Upstream of Confluence with Susan Drain	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> <li>riparian vegetation – cattails and <i>Phragmites</i></li> </ul>	none	partially obstructed	none	cha
No Name Tributary of Wolfe Drain along HWY 401	Upstream of confluence with Wolfe Drain	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> <li>riparian vegetation – cattails and <i>Phragmites</i></li> </ul>	ephemeral	partially obstructed	none	cha
No Name Tributary of Wolfe Drain along Howard Avenue	Upstream of confluence with Wolfe Drain	F	none	<ul> <li>roadside ditch</li> <li>dry</li> <li>lack of channel definition</li> <li>riparian vegetation – cattails and <i>Phragmites</i></li> </ul>	ephemeral	partially obstructed	none	cha
Susan Drain	Downstream of Broadway Street to Confluence with NoName Tributary	F	none	<ul> <li>ditched watercourse</li> <li>dry</li> <li>riparian vegetation – Oak forest</li> <li>substrate - detritus</li> </ul>	intermittent	unobstructed	none	cha
Talbot Drain	Upstream of confluence with Cahill Drain	F	none	<ul> <li>narrow ditched watercourse</li> <li>riparian vegetation – trees, shrubs, herbaceous vegetation and grasses</li> <li>substrate – clay</li> <li>perched above Cahill Drain at confluence</li> </ul>	intermittent	obstructed	none	cha
Titcombe Drain	Downstream of E.C. Row	F	warmwater sportfish	<ul> <li>seasonal ditched watercourse</li> <li>no flow in September 2006</li> <li>pockets of standing water near Chappus Road</li> <li>approximate width of channel 1.5 m</li> <li>riparian vegetation – trees, shrubs, herbaceous vegetation and manicured grass</li> <li>substrate – silt and detritus</li> </ul>	intermittent	unobstructed	important	cha
Unnamed pond	West of Outer Drive, east of Howard Ave, South of Talbot Road	unclassified	warmwater sportfish	<ul> <li>pond habitat</li> <li>dimensions approximately 55x55 m</li> <li>riparian vegetation – cattails, trees and shrubs</li> <li>substrate – clay and muck</li> </ul>	permanent	Not connected	marginal	Ma
Wolfe Drain	Upstream of Confluence with Collins Drain	F	warmwater baitfish	<ul> <li>ditched watercourse</li> <li>morphology – flats and runs</li> <li>width 1.5 m, depth 25 cm</li> <li>sparse instream cover</li> <li>riparian vegetation – herbaceous vegetation and grasses</li> <li>substrate - clay</li> </ul>	permanent	unobstructed	marginal	cha

el Structure nnelized, elized lined, atural)	Comments
nnelized	
n made	<ul><li>Man made pond</li><li>Not connected to watercourses</li></ul>
nnelized	

Watercourse/ Waterbody Name	Reach Location	Agricultural Municipal Drain Classification (A, B, C, D, E, F)	Fish Community (warmwater, coolwater, coldwater, baitfish, sportfish, migratory)	Habitat Summary	Flow Conditions (ephemeral, intermittent, permanent)	Drainage Connectivity (obstructed, partially obstructed, unobstructed)	Habitat Class (marginal, important, critical)	Channe (char channe na
Wolfe Drain	Confluence with Collins Drain to Confluence with Cahill Drain	F	warmwater baitfish	<ul> <li>ditched watercourse</li> <li>morphology – flats with some runs, pools and riffles</li> <li>width 2 m, depth 25 cm</li> <li>sparse instream cover</li> <li>riparian vegetation – trees, shrubs, herbaceous vegetation and grasses</li> <li>well shaded for most of reach</li> <li>substrate - clay</li> </ul>	permanent	unobstructed	marginal	char
Wolfe Drain	Confluence with Cahill Drain to Talbot Road Crossing	E	warmwater sportfish	<ul> <li>ditched watercourse</li> <li>morphology – flats with some runs, riffles and pools</li> <li>width 2 m, depth 15 cm</li> <li>sparse instream cover</li> <li>riparian vegetation –shrubs, herbaceous vegetation and grasses</li> <li>good shade for most of reach</li> <li>substrate - clay</li> </ul>	permanent	unobstructed	marginal	chai
Youngstown Drain	Upstream of Confluence with Basin Drain	F	warmwater baitfish	<ul> <li>narrow ditched watercourse</li> <li>morphology - flats</li> <li>width 0.3 m, depth 10 cm</li> <li>very little flow</li> <li>riparian vegetation – herbaceous vegetation and grasses</li> <li>substrate – clay</li> </ul>	intermittent	unobstructed	marginal	chai

el Structure nnelized, elized lined, atural)	Comments
nnelized	
nnelized	
nnelized	



#### APPENDIX F LIST OF WILDLIFE SPECIES RECORDED IN THE AREA OF INVESTIGATION

Wildlife	Scientific Name	Common Name	COSEWIC	COSSARO	Local	Legal Status	Others <sup>1</sup>
Herpetofauna	Bufo americanus	American Toad					
	Pseudacris triseriata	Western Chorus Frog					
	Rana pipiens	Northern Leopard Frog					
	Rana clamitans	Green Frog					
	Chelydra serpentina	Snapping Turtle				FWCA(G)	
	Chrysemys picta marginata	Midland Painted Turtle				FWCA(P)	
	Thamnophis sirtalis	Eastern Gartersnake					
						SARA(1)/ OESA (4)/	
	Thamnophis butleri	Butler's Gartersnake	THR	THR		FWCA(P)	
	Storeria dekavi	Dekay's Brown Snake					
	Storeria occipitomaculata	Northern Red-bellied Snake					
	Elaphe glovdi	Eastern Fox Snake	THR	THR		SARA(1)/ OESA (4)/ FWCA(P)	
Birds	Branta canadensis	Canada Goose				MBCA	
	Aix sponsa	Wood Duck			BSC	MBCA	
	Anas platvrhvnchos	Mallard				MBCA	
						MBCA /	
	Phasianus colchicus	Ring-necked Pheasant				FWCA(G)	
	Phalacrocorax auritus	Double-crested Cormorant				, í	
	Ardea herodias	Great Blue Heron				MBCA	
	Ardea alba	Great Egret				MBCA	
	Nvcticorax nvcticorax	Black-crowned Night Heron			BSC	MBCA	
	Cathartes aura	Turkey Vulture			BSC	FWCA(P)	
	Pandion haliaetus	Osprev			BSC	FWCA(P)	
	Accipiter striatus	Sharp-shinned Hawk				FWCA(P)	
	Accipiter cooperii	Cooper's Hawk				FWCA(P)	
	Accipiter gentilis	Northern Goshawk				FWCA(P)	
	Buteo platypterus	Broad-winged Hawk			BSC	FWCA(P)	
	Buteo iamaicensis	Red-tailed Hawk				FWCA(P)	
	Falco sparverius	American Kestrel			BSC	FWCA(P)	
	Charadrius vociferus	Killdeer				MBCA	
	Actitis macularius	Spotted Sandpiper			BSC	MBCA	
	Gallinago delicata	Wilson's Snipe			BSC	MBCA	
	Scolopax minor	American Woodcock			BSC	MBCA	
	Larus delawarensis	Ring-billed Gull				MBCA	
	Columba livia	Rock Pigeon					
	Zenaida macroura	Mourning Dove				MBCA	
	Coccvzus americanus	Yellow-billed Cuckoo			BSC	MBCA	*
	Megascops asio	Eastern Screech-Owl				FWCA(P)	
	Archilochus colubris	Ruby-throated Hummingbird			BSC	MBCA	
	Melanerpes	gond				OESA (5)/	
	erythrocephalus	Red-headed Woodpecker	SC	SC	BSC	MBCA	
	ivielanerpes carolinus	Red-bellied woodpecker			R2C	MBCA	
	Picoides pubescens	Downy Woodpecker				MBCA	,s.
	Picoides villosus	Hairy Woodpecker				MBCA	*
	Colaptes auratus	Northern Flicker				MRCA	

<sup>&</sup>lt;sup>1</sup> Denotes species that have been identified in the region by others and that suitable habitat exists in the area of investigation.

## APPENDIX F LIST OF WILDLIFE SPECIES RECORDED IN THE AREA OF INVESTIGATION

Wildlife	Scientific Name	Common Name	COSEWIC	COSSARO	Local	Legal Status	Others <sup>1</sup>
	Contopus virens	Eastern Wood Pewee				MBCA	
	Empidonax traillii	Willow Flycatcher				MBCA	
	Empidonax minimus	Least Flycatcher				MBCA	
	Sayornis phoebe	Eastern Phoebe			BSC	MBCA	
	Myiarchus crinitus	Great Crested Flycatcher				MBCA	*
	Tyrannus tyrannus	Eastern Kingbird			BSC	MBCA	
	Vireo flavifrons	Yellow-throated Vireo				MBCA	
	Vireo solitarius	Blue-headed Vireo				MBCA	
	Vireo gilvus	Warbling Vireo				MBCA	
	Vireo olivaceus	Red-eyed Vireo				MBCA	
	Cyanocitta cristata	Blue Jay				FWCA(P)	
	Corvus brachyrhynchos	American Crow					
	Eremophila alpestris	Horned Lark			BSC	MBCA	
	Tachycineta bicolor	Tree Swallow				MBCA	
		Northern Rough-winged					
	Stelgidopteryx serripennis	Swallow			BSC	MBCA	
	Petrochelidon pyrrhonota	Cliff Swallow			BSC	MBCA	
	Hirundo rustica	Barn Swallow			BSC	MBCA	
	Poecile atricapillus	Black-capped Chickadee				MBCA	
	Sitta carolinensis	White-breasted Nuthatch				MBCA	
	Certhia americana	Brown Creeper			BSC	MBCA	
	Thrvothorus Iudovicianus	Carolina Wren			BSC	MBCA	
	Troalodytes aedon	House Wren				MBCA	
	Regulus satrapa	Golden-crowned Kinglet				MBCA	
	Regulus calendula	Ruby-crowned Kinglet				MBCA	
	Polioptila caerulea	Blue-gray Gnatcatcher			BSC	MBCA	
	Sialia sialis	Eastern Bluebird			BSC	MBCA	
	Cathartes fuscescens	Veerv			BSC	MBCA	
	Catharus guttatus	Hermit Thrush				MBCA	
	Hylocichla mustelina	Wood Thrush				MBCA	
	Turdus migratorius	American Robin				MBCA	
	Dumetella carolinensis	Grav Catbird			BSC	MBCA	
	Toxostoma rufum	Brown Thrasher			BSC	MBCA	
	Sturnus vulgaris	European Starling			200		
	Bombycilla cedrorum	Cedar Waxwing				MBCA	
		ooddi Hammig				OFSA (5)/	
	Vermivora chrysoptera	Golden-winged Warbler				MBCA	
	Vermivora peregrina	Tennessee Warbler				MBCA	
	Vermivora ruficapilla	Nashville Warbler				MBCA	
	Parula americana	Northern Parula				MBCA	
	Dendroica petechia	Yellow Warbler				MBCA	
	Dendroica pensylvanica	Chestnut-sided Warbler			BSC	MBCA	
	Dendroica magnolia	Magnolia Warbler		1	200	MBCA	
	Dendroica caerulescens	Black-throated Blue Warbler		1		MBCA	
	Dendroica coronata	Yellow-rumped Warbler	1	1		MBCA	
	Dendroica virens	Black-throated Green Warbler		1		MBCA	
	Dendroica fusca	Blackburnian Warbler	1	ł		MBCA	
	Dendroica pinus	Pine Warbler	1	ł		MBCA	
	Dendroica palmarum	Palm Warbler		1		MBCA	
	Dendroica castanea	Bay-breasted Warbler				MBCA	
	Mniotilta varia	Black and White Warbler		1		MBCA	
μ				1			I

APPENDIX F
LIST OF WILDLIFE SPECIES RECORDED IN THE AREA OF INVESTIGATION

Wildlife	Scientific Name	Common Name	COSEWIC	COSSARO	Local	Legal Status	Others <sup>1</sup>
	Setophaga ruticilla	American Redstart			BSC	MBCA	
	Seiurus aurocapilla	Ovenbird			BSC	MBCA	*
	Oporornis philadelphia	Mourning Warbler			BSC	MBCA	
	Geothlypis trichas	Common Yellowthroat				MBCA	
	Wilsonia pusilla	Wilson's Warbler				MBCA	
	Piranga olivacea	Scarlet Tanager			BSC	MBCA	*
	Pipilo erythrophthalmus	Eastern Towhee			BSC	MBCA	
	Spizella passerina	Chipping Sparrow				MBCA	
	Spizella pusilla	Field Sparrow			BSC	MBCA	
	Pooecetes gramineus	Vesper Sparrow			BSC	MBCA	
	Passerculus sandwichensis	Savannah Sparrow			BSC	MBCA	
	Melospiza georgiana	Swamp Sparrow			BSC	MBCA	*
	Melospiza melodia	Song Sparrow				MBCA	
	Melospiza lincolnii	Lincoln's Sparrow				MBCA	
	Zonotrichia albicollis	White-throated Sparrow				MBCA	
	Zonotrichia leucophrys	White-crowned Sparrow				MBCA	
	Junco hyemalis	Dark-eyed Junco				MBCA	
	Cardinalis cardinalis	Northern Cardinal				MBCA	
	Pheucticus Iudovicianus	Rose-breasted Grosbeak				MBCA	
	Passerina cyanea	Indigo Bunting				MBCA	
	Agelaius phoeniceus	Red-winged Blackbird					
	Quiscalus quiscula	Common Grackle					
	Molothrus ater	Brown-headed Cowbird					
	Icterus spurius	Orchard Oriole			BSC	MBCA	
	Icterus galbula	Baltimore Oriole				MBCA	
	Carpodacus mexicanus	House Finch				MBCA	
	Carduelis tristis	American Goldfinch			BSC	MBCA	
	Passer domesticus	House Sparrow					
Mammals	Didelphis virginiana	Virginia Opossum				FWCA(F)	
	Blarina brevicauda	N. Short-tailed Shrew				FWCA(P)	
	Eptesicus fuscus	Big Brown Bat				FWCA(P)	*
	Lasiurus borealis	Eastern Red Bat				FWCA(P)	*
	Lasiurus cinereus	Hoary Bat				FWCA(P)	*
	Sylvilagus floridanus	Eastern Cottontail				FWCA(G)	
	Lepus europaeus	European Hare				FWCA(G)	
	Tamias striatus	Eastern Chipmunk				FWCA(P)	
	Marmota monax	Groundhog					
	Sciurus carolinensis	Gray Squirrel				FWCA(G)	
	Peromyscus leucopus	White-footed Mouse					
	Microtus pennsylvanicus	Meadow Vole					
	Ondatra zibethica	Muskrat				FWCA(F)	
	Rattus norvegicus	Norway Rat					*
	Mus musculus	House Mouse					*
	Canis latrans	Coyote				FWCA(F)	
	Vulpes vulpes	Red Fox				FWCA(F)	
	Procyon lotor	Raccoon				FWCA(F)	
	Mephitis mephitis	Striped Skunk				FWCA(F)	
	Odocoileus virginianus	White-tailed Deer				FWCA(G)	

Note: Species status current to October 2007.

APPENDIX G

APPENDIX G	
LIST OF BIRD SPECIES WITH BREEDING E	VIDENCE

Scientific Name	Common Name	COSEWIC	COSSARO	Local	Legal Status	Others <sup>1</sup>	BBE
Branta canadensis	Canada Goose				MBCA		NE, FY
Aix sponsa	Wood Duck			BSC	MBCA		
Anas platyrhynchos	Mallard				MBCA		FY
					MBCA/		
Phasianus colchicus	Ring-necked Pheasant				FWCA(G)		Т
Phalacrocorax auritus	Double-crested Cormorant						
Ardea herodias	Great Blue Heron				MBCA		
Ardea alba	Great Egret				MBCA		
Nycticorax nycticorax	Black-crowned Night Heron			BSC	MBCA		
Cathartes aura	Turkey Vulture			BSC	FWCA(P)		
Pandion haliaetus	Osprey			BSC	FWCA(P)		
Accipiter striatus	Sharp-shinned Hawk				FWCA(P)		
Accipiter cooperii	Cooper's Hawk				FWCA(P)		Н
Accipiter gentilis	Northern Goshawk				FWCA(P)		
Buteo platypterus	Broad-winged Hawk			BSC	FWCA(P)		
Buteo jamaicensis	Red-tailed Hawk				FWCA(P)		NE
Falco sparverius	American Kestrel			BSC	FWCA(P)		CF
Charadrius vociferus	Killdeer				MBCA		T, A, FY
Actitis macularius	Spotted Sandpiper			BSC	MBCA		T, A
Gallinago delicata	Wilson's Snipe			BSC	MBCA		
Scolopax minor	American Woodcock	-	1	BSC	MBCA		
Larus delawarensis	Ring-billed Gull	-	1		MBCA		
Columba livia	Rock Pigeon		1				
Zenaida macroura	Mourning Dove	-	1		MBCA		T, FY
Coccyzus americanus	Yellow-billed Cuckoo		1	BSC	MBCA	*	
Megascops asio	Eastern Screech-Owl	-	1		FWCA(P)		
Archilochus colubris	Ruby-throated Hummingbird	-	1	BSC	MBCA		
					OESA (5)/		
Melanerpes erythrocephalus	Red-headed Woodpecker	SC	SC	BSC	MBCA		
Melanerpes carolinus	Red-bellied Woodpecker			BSC	MBCA		
Dissides with second	Deureu Masalasakan						N, CF,
Picoides pubescens	Downy woodpecker				MBCA	*	ΓY
Picoides Villosus	Hairy Woodpecker		<u></u>	───	MBCA		
Colaptes auratus	Northern Flicker			<u> </u>	MBCA		D, FY 
Contopus virens	Eastern Wood Pewee		<u> </u>		MBCA	<u> </u>	
Empidonax traillii	Willow Flycatcher			<u> </u>	MBCA		NE, NY
Empidonax minimus	Least Flycatcher				MBCA	<b> </b>	
Sayornis phoebe	Eastern Phoebe			BSC	MBCA		
Myiarchus crinitus	Great Crested Flycatcher			<u> </u>	MBCA	*	
Tyrannus tyrannus	Eastern Kingbird			BSC	MBCA	ļ	Т, А
Vireo flavifrons	Yellow-throated Vireo			<u> </u>	MBCA		S
Vireo solitarius	Blue-headed Vireo		<u> </u>		MBCA		
Vireo gilvus	Warbling Vireo				MBCA		S, A
Vireo olivaceus	Red-eyed Vireo				MBCA		S, T
Cyanocitta cristata	Blue Jay				FWCA(P)		Т

<sup>&</sup>lt;sup>1</sup> Denotes species that have been identified in the region by others and that suitable habitat exists in the area of investigation.

#### APPENDIX G LIST OF BIRD SPECIES WITH BREEDING EVIDENCE

Scientific Name	Common Name	COSEWIC	COSSARO	Local	Legal Status	Others <sup>1</sup>	BBE
Corvus brachyrhynchos	American Crow						
Eremophila alpestris	Horned Lark			BSC	MBCA		FY
Tachycineta bicolor	Tree Swallow				MBCA		AE
	Northern Rough-winged						
Stelgidopteryx serripennis	Swallow			BSC	MBCA		
Petrochelidon pyrrhonota	Cliff Swallow			BSC	MBCA		AE
Hirundo rustica	Barn Swallow			BSC	MBCA		N, AE
Poecile atricapillus	Black-capped Chickadee				MBCA		FY
Sitta carolinensis	White-breasted Nuthatch				MBCA		
Certhia Americana	Brown Creeper			BSC	MBCA		
Thryothorus ludovicianus	Carolina Wren			BSC	MBCA		S
Troglodytes aedon	House Wren				MBCA		S
Regulus satrapa	Golden-crowned Kinglet				MBCA		
Regulus calendula	Ruby-crowned Kinglet				MBCA		
Polioptila caerulea	Blue-gray Gnatcatcher			BSC	MBCA		
Sialia sialis	Eastern Bluebird			BSC	MBCA		
Cathartes fuscescens	Veery			BSC	MBCA		
Catharus guttatus	Hermit Thrush				MBCA		
Hylocichla mustelina	Wood Thrush				MBCA		S, T, NE
Turdus migratorius	American Robin				MBCA		NE, NY, FY
Dumetella carolinensis	Gray Catbird			BSC	MBCA		N, NE, NY, CF
Toxostoma rufum	Brown Thrasher			BSC	MBCA		FY
Sturnus vulgaris	European Starling						AE, FY
Bombycilla cedrorum	Cedar Waxwing				MBCA		A, N, CF
					OESA (5)/		
Vermivora chrysoptera	Golden-winged Warbler				MBCA		
Vermivora peregrine	Tennessee Warbler				MBCA		
Vermivora ruficapilla	Nashville Warbler				MBCA		
Parula Americana	Northern Parula				MBCA		
Dendroica petechia	Yellow Warbler				MBCA		NE, CF
Dendroica pensylvanica	Chestnut-sided Warbler			BSC	MBCA		
Dendroica magnolia	Magnolia Warbler				MBCA		
Dendroica caerulescens	Black-throated Blue Warbler				MBCA		
Dendroica coronata	Yellow-rumped Warbler				MBCA		
Dendroica virens	Black-throated Green Warbler				MBCA		
Dendroica fusca	Blackburnian Warbler				MBCA		
Dendroica pinus	Pine Warbler				MBCA		
Dendroica palmarum	Palm Warbler				MBCA		
Dendroica castanea	Bay-breasted Warbler				MBCA		
Mniotilta varia	Black and White Warbler				MBCA		
Setophaga ruticilla	American Redstart			BSC	MBCA		
Seiurus aurocapilla	Ovenbird			BSC	MBCA	*	
Oporornis Philadelphia	Mourning Warbler			BSC	MBCA		
Geothlypis trichas	Common Yellowthroat				MBCA		A, T
Wilsonia pusilla	Wilson's Warbler				MBCA		

APPENDIX G	
LIST OF BIRD SPECIES WITH BREEDING EVIDENC	E

Scientific Name	Common Name	COSEWIC	COSSARO	Local	Legal Status	Others <sup>1</sup>	BBE
Piranga olivacea	Scarlet Tanager			BSC	MBCA	*	
Pipilo erythrophthalmus	Eastern Towhee			BSC	MBCA		S, T
Spizella passerine	Chipping Sparrow				MBCA		Т
Spizella pusilla	Field Sparrow			BSC	MBCA		S, T
Pooecetes gramineus	Vesper Sparrow			BSC	MBCA		CF
Passerculus sandwichensis	Savannah Sparrow			BSC	MBCA		S, T
Melospiza melodia	Song Sparrow				MBCA		CF, FY
Melospiza lincolnii	Lincoln's Sparrow				MBCA		
Melospiza Georgiana	Swamp Sparrow			BSC	MBCA	*	
Zonotrichia albicollis	White-throated Sparrow				MBCA		
Zonotrichia leucophrys	White-crowned Sparrow				MBCA		
Junco hyemalis	Dark-eyed Junco				MBCA		
Cardinalis cardinalis	Northern Cardinal				MBCA		CF
Pheucticus Iudovicianus	Rose-breasted Grosbeak				MBCA		S, A, CF
Passerina cyanea	Indigo Bunting				MBCA		S, T, D, CF
Agelaius phoeniceus	Red-winged Blackbird						N, CF, FY
Quiscalus quiscula	Common Grackle						CF, FY
Molothrus ater	Brown-headed Cowbird						NY
Icterus spurious	Orchard Oriole			BSC	MBCA		D, CF
Icterus galbula	Baltimore Oriole				MBCA		NE, CF
Carpodacus mexicanus	House Finch				MBCA		T, FY
Carduelis tristis	American Goldfinch			BSC	MBCA		D
Passer domesticus	House Sparrow						AE, CF, FY

Note: Species status current to October 2007.

BBE - Breeding Bird Evidence (according to Bird Studies Canada):

Possible Breeding:

- H Species observed in its breeding season in suitable nesting habitat.
- S Singing male present in its breeding season in suitable nesting habitat.

#### Probable Breeding:

- T Permanent territory presumed through registration of territorial song on at least two days, a week or so apart, at the same place.
- D Courtship or display between male and female, including courtship feeding or copulation.
- A Agitated behavior or anxiety calls of an adult.
- N Nest-building or excavation of nest hole.

#### Confirmed Breeding:

- AE Adults leaving or entering nest site in circumstances indication occupied nest.
- NU Used nest or egg shell found (occupied or laid within the period of study).
- FY Recently fledged young or downy young, including young incapable of sustained flight.
- CF Adult carrying food for young.
- NE Nest containing eggs.
- NY Nest with young seen or heard.

APPENDIX H

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
1	0328060E 4681980N	Brighton Beach Broadway Street	Jun 5	Phasianus colchicusZenaida macrouraColaptes auratusVireo gilvusPoecile atricapillusSialia sialisHylocichla mustelinaTurdus migratoriusDumetella carolinensisSturnus vulgarisBombycilla cedrorumDendroica petechiaPipilo erythrophthalmusMelospiza melodiaCardinalis cardinalisQuiscalus quisculaIcterus galbula	Ring necked PheasantMourning DoveNorthern FlickerWarbling VireoBlack capped ChickadeeEastern BluebirdWood ThrushAmerican RobinGray CatbirdEuropean StarlingCedar WaxwingYellow WarblerEastern TowheeSong SparrowNorthern CardinalCommon GrackleBaltimore Oriole	Jun 15	<i>Phasianus colchicus</i> <i>Vireo gilvus</i> <i>Cyanocitta cristata</i> <i>Thryothorus ludovicianus</i> <i>Troglodytes aedon</i> <i>Turdus migratorius</i> <i>Dumetella carolinensis</i> <i>Melospiza melodia</i> <i>Cardinalis cardinalis</i> <i>Icterus galbula</i>	Ring necked Pheasant Warbling Vireo Blue Jay Carolina Wren House Wren American Robin Gray Catbird Song Sparrow Northern Cardinal Baltimore Oriole
2	0328248E 4682110N	Brighton Beach Scotten Road	Jun 5	Zenaida macroura Colaptes auratus Vireo gilvus Troglodytes aedon Turdus migratorius Bombycilla cedrorum Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Passer domesticus	Mourning Dove Northern Flicker Warbling Vireo House Wren American Robin Cedar Waxwing Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird House Sparrow	Jun 15	Zenaida macroura Colaptes auratus Vireo gilvus Corvus brachyrhynchos Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Quiscalus quiscula Molothrus ater Passer domesticus	Mourning Dove Northern Flicker Warbling Vireo American Crow House Wren American Robin Gray Catbird European Starling Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird Common Grackle Brown headed Cowbird House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
3	0327940E 4682265N	Brighton Beach Road	Jun 5	Phasianus colchicus Zenaida macroura Vireo gilvus Cyanocitta cristata Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Melospiza melodia Agelaius phoeniceus	Ring necked Pheasant Mourning Dove Warbling Vireo Blue Jay House Wren American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Song Sparrow Red winged Blackbird	Jun 15	Charadrius vociferus Colaptes auratus Vireo gilvus Stelgidopteryx serripennis Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Melospiza melodia Agelaius phoeniceus Quiscalus quiscula Molothrus ater Carduelis tristis Passer domesticus	Killdeer Northern Flicker Warbling Vireo Northern Rough winged Swallow House Wren American Robin Gray Catbird European Starling Yellow Warbler Song Sparrow Red winged Blackbird Common Grackle Brown headed Cowbird American Goldfinch House Sparrow
4	0327720E 4682194N	Brighton Beach Broadway Street	Jun 5	Phasianus colchicus Colaptes auratus Vireo olivaceus Troglodytes aedon Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Dendroica petechia Cardinalis cardinalis Pheucticus Iudovicianus Agelaius phoeniceus Molothrus ater Icterus galbula Carduelis tristis Passer domesticus	Ring necked Pheasant Northern Flicker Red eyed Vireo House Wren American Robin Gray Catbird Cedar Waxwing Yellow Warbler Northern Cardinal Rose breasted Grosbeak Red winged Blackbird Brown headed Cowbird Baltimore Oriole American Goldfinch House Sparrow	Jun 15	Phasianus colchicusPicoides pubescensColaptes auratusContopus virensVireo flavifronsVireo gilvusVireo olivaceusTroglodytes aedonTurdus migratoriusDumetella carolinensisBombycilla cedrorumDendroica petechiaMelospiza melodiaCardinalis cardinalisPheucticus ludovicianusPasserina cyaneaMolothrus aterIcterus galbulaCarduelis tristisPasser domesticus	Ring necked Pheasant         Downy Woodpecker         Northern Flicker         Eastern Wood Pewee         Yellow throated Vireo         Warbling Vireo         Red eyed Vireo         House Wren         American Robin         Gray Catbird         Cedar Waxwing         Yellow Warbler         Song Sparrow         Northern Cardinal         Rose breasted Grosbeak         Indigo Bunting         Brown headed Cowbird         Baltimore Oriole         American Goldfinch         House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
5	0327408E	Brighton Beach	Jun 5	Zenaida macroura	Mourning Dove	Jun 15	Phasianus colchicus	Ring necked Pheasant
	4682286N	Broadway & Sandwich		Colaptes auratus	Northern Flicker		Zenaida macroura	Mourning Dove
				Vireo gilvus	Warbling Vireo		Picoides pubescens	Downy Woodpecker
				Troglodytes aedon	House Wren		Colaptes auratus	Northern Flicker
				Turdus migratorius	American Robin		Contopus virens	Eastern Wood Pewee
				Dumetella carolinensis	Gray Catbird		Tachycineta bicolor	Tree Swallow
				Sturnus vulgaris	European Starling		Thryothorus ludovicianus	Carolina Wren
				Bombycilla cedrorum	Cedar Waxwing		Turdus migratorius	American Robin
				Dendroica petechia	Yellow Warbler		Dumetella carolinensis	Gray Catbird
				Melospiza melodia	Song Sparrow		Bombycilla cedrorum	Cedar Waxwing
				Cardinalis cardinalis	Northern Cardinal		Dendroica petechia	Yellow Warbler
				Pheucticus ludovicianus	Rose breasted Grosbeak		Melospiza melodia	Song Sparrow
				Passerina cyanea	Indigo Bunting		Cardinalis cardinalis	Northern Cardinal
				Agelaius phoeniceus	Red winged Blackbird		Agelaius phoeniceus	Red winged Blackbird
				Quiscalus quiscula	Common Grackle		Molothrus ater	Brown headed Cowbird
				Molothrus ater	Brown headed Cowbird		Icterus galbula	Baltimore Oriole
				Icterus galbula	Baltimore Oriole		Carduelis tristis	American Goldfinch
				Carduelis tristis	American Goldfinch		Passer domesticus	House Sparrow
				Passer domesticus	House Sparrow			
6	0327278E	Brighton Beach	Jun 5	Megascops asio	Eastern Screech Owl	Jun 15	Phasianus colchicus	Ring necked Pheasant
	4682455N	? Road		Picoides pubescens	Downy Woodpecker		Picoides pubescens	Downy Woodpecker
				Colaptes auratus	Northern Flicker		Colaptes auratus	Northern Flicker
				Empidonax traillii	Willow Flycatcher		Iroglodytes aedon	House Wren
				Vireo olivaceus	Red eyed Vireo		Turdus migratorius	American Robin
				Cyanocitta cristata	Blue Jay		Dumetella carolinensis	Gray Catbird
				Poecile allicapilius			Toxostoma rutum	Brown Thrasher
				Thryolhorus ludovicianus	Carolina Wren		Bombycilla cedrorum	Cedar Waxwing
				Troglodytes aedon	House wren		Denaroica pelechia	Chipping Sporrow
				Turuus Inigraturius Sturnus vulgaris	American Robin		Spizella passerilla Molocpiza molodia	Song Sparrow
				Siurrius vulgaris Dombycilla codrorum	Codar Waxwing		Cardinalis cardinalis	Solly Spallow Northern Cardinal
				Dondroica notochia	Vollow Warblor		Varumans carumans Agalaius phoopicous	Pod wingod Blackbird
				Melosniza melodia	Song Sparrow		Molothrus ater	Brown beaded Cowbird
				Cardinalis cardinalis	Northern Cardinal		Carduelis tristis	American Goldfinch
				Δαρίαιος πλορηίζους	Red winned Blackhird			American oolumen
				Molothrus ater	Brown headed Cowhird			
				Icterus galbula	Baltimore Oriole			

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
7	0327080E 4682640N	Brighton Beach Detroit River	Jun 5	Empidonax traillii Vireo gilvus Hirundo rustica Thryothorus ludovicianus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Icterus galbula Carduelis tristis	Willow Flycatcher Warbling Vireo Barn Swallow Carolina Wren House Wren American Robin Gray Catbird European Starling Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird Baltimore Oriole American Goldfinch	Jun 15	Picoides pubescens Empidonax traillii Hirundo rustica Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Melospiza melodia Cardinalis cardinalis Icterus galbula Carduelis tristis	Downy Woodpecker Willow Flycatcher Barn Swallow American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Song Sparrow Northern Cardinal Baltimore Oriole American Goldfinch
8	0327678E 4682590N	Brighton Beach Chappus & Sandwich	Jun 5	Phasianus colchicus Zenaida macroura Empidonax traillii Tyrannus tyrannus Vireo gilvus Troglodytes aedon Turdus migratorius Sturnus vulgaris Dendroica petechia Melospiza melodia Agelaius phoeniceus Quiscalus quiscula Molothrus ater	Ring necked Pheasant Mourning Dove Willow Flycatcher Eastern Kingbird Warbling Vireo House Wren American Robin European Starling Yellow Warbler Song Sparrow Red winged Blackbird Common Grackle Brown headed Cowbird	Jun 14	Zenaida macroura Empidonax traillii Vireo gilvus Hirundo rustica Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Icterus galbula Carpodacus mexicanus	Mourning Dove Willow Flycatcher Warbling Vireo Barn Swallow House Wren American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird Baltimore Oriole House Einch

APPENDIX H RESULTS OF BIRD POINT COUNT SURVEYS

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
9	0328335E	Brighton Beach	Jun 6	Charadrius vociferus	Killdeer	Jun 14	Charadrius vociferus	Killdeer
		Chappus &						
	4682365N	Scotten		Zenaida macroura	Mourning Dove		Empidonax traillii	Willow Flycatcher
				Empidonax traillii	Willow Flycatcher		Thryothorus ludovicianus	Carolina Wren
				Turdus migratorius	American Robin		Turdus migratorius	American Robin
				Dendroica petechia	Yellow Warbler		Dumetella carolinensis	Gray Catbird
				Melospiza melodia	Song Sparrow		Sturnus vulgaris	European Starling
				Cardinalis cardinalis	Northern Cardinal		Dendroica petechia	Yellow Warbler
				Agelaius phoeniceus	Red winged Blackbird		Melospiza melodia	Song Sparrow
							Agelaius phoeniceus	Red winged Blackbird
							Carduelis tristis	American Goldfinch
							Passer domesticus	House Sparrow
10	0328448E	Yawkey Ojibway &	Jun 6	Poecile atricapillus	Black capped Chickadee	Jun 15	Cyanocitta cristata	Blue Jay
	4681895N	Broadway		Troglodytes aedon	House Wren		Thryothorus ludovicianus	Carolina Wren
				Turdus migratorius	American Robin		Troglodytes aedon	House Wren
				Dumetella carolinensis	Gray Catbird		Turdus migratorius	American Robin
				Bombycilla cedrorum	Cedar Waxwing		Dumetella carolinensis	Gray Catbird
				Cardinalis cardinalis	Northern Cardinal		Bombycilla cedrorum	Cedar Waxwing
				Passerina cyanea	Indigo Bunting		Cardinalis cardinalis	Northern Cardinal
							Passerina cyanea	Indigo Bunting
							Icterus galbula	Baltimore Oriole
							Carduelis tristis	American Goldfinch
							Passer domesticus	House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
11	0328785E 4682010N	Yawkey Beech Street	Jun 6	Phasianus colchicus Picoides pubescens Vireo gilvus Vireo olivaceus Cyanocitta cristata Troglodytes aedon Turdus migratorius Sturnus vulgaris Dendroica petechia Geothlypis trichas Spizella passerina Passerina cyanea Agelaius phoeniceus Molothrus ater Icterus galbula Carpodacus mexicanus Carduelis tristis Passer domesticus	Ring necked Pheasant Downy Woodpecker Warbling Vireo Red eyed Vireo Blue Jay House Wren American Robin European Starling Yellow Warbler Common Yellowthroat Chipping Sparrow Indigo Bunting Red winged Blackbird Brown headed Cowbird Baltimore Oriole House Finch American Goldfinch House Sparrow	Jun 16	Vireo gilvus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Spizella passerina Melospiza melodia Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Molothrus ater Carduelis tristis	Warbling Vireo House Wren American Robin Gray Catbird European Starling Chipping Sparrow Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Brown headed Cowbird American Goldfinch
12	0328630E 4682270N	Yawkey Chappus Street	Jun 6	Zenaida macroura Contopus virens Empidonax traillii Vireo gilvus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Cardinalis cardinalis Agelaius phoeniceus Molothrus ater Icterus galbula Passer domesticus	Mourning Dove Eastern Wood Pewee Willow Flycatcher Warbling Vireo House Wren American Robin Gray Catbird European Starling Yellow Warbler Northern Cardinal Red winged Blackbird Brown headed Cowbird Baltimore Oriole House Sparrow	Jun 16	Empidonax traillii Vireo gilvus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Agelaius phoeniceus Passer domesticus	Willow Flycatcher Warbling Vireo House Wren American Robin Gray Catbird European Starling Yellow Warbler Red winged Blackbird House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
13	0329038E	Yawkey Matchette &	Jun 6	Zenaida macroura	Mourning Dove	Jun 16	Zenaida macroura	Mourning Dove
	4681910N	Armanda		Tyrannus tyrannus Cyanocitta cristata Troglodytes aedon Turdus migratorius Sturnus vulgaris Cardinalis cardinalis Agelaius phoeniceus Ouiscalus quiscula Icterus galbula Passer domesticus	Eastern Kingbird Blue Jay House Wren American Robin European Starling Northern Cardinal Red winged Blackbird Common Grackle Baltimore Oriole House Sparrow		Cyanocitta cristata Turdus migratorius Sturnus vulgaris Cardinalis cardinalis Agelaius phoeniceus Quiscalus quiscula Molothrus ater Icterus galbula Passer domesticus	Blue Jay American Robin European Starling Northern Cardinal Red winged Blackbird Common Grackle Brown headed Cowbird Baltimore Oriole House Sparrow
14	0328982E 4682330N	Yawkey S.Matchette & EC Row	Jun 6	Charadrius vociferus Hirundo rustica Turdus migratorius Dumetella carolinensis Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus	Killdeer Barn Swallow American Robin Gray Catbird Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird	Jun 16	Charadrius vociferus Vireo gilvus Turdus migratorius Sturnus vulgaris Dumetella carolinensis Bombycilla cedrorum Dendroica petechia Geothlypis trichas Spizella passerina Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Quiscalus quiscula Molothrus ater Icterus galbula Carpodacus mexicanus Passer domosticus	Killdeer Warbling Vireo American Robin European Starling Gray Catbird Cedar Waxwing Yellow Warbler Common Yellowthroat Chipping Sparrow Song Sparrow Northern Cardinal Red winged Blackbird Common Grackle Brown headed Cowbird Baltimore Oriole House Finch House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
15	0329250E	Malden Park	Jun 6	Charadrius vociferus	Killdeer	Jun 16	Charadrius vociferus	Killdeer
	4682566N	EC Row		Vireo gilvus Hirundo rustica Turdus migratorius	Warbling Vireo Barn Swallow American Robin		Actitis macularius Zenaida macroura Picoides pubescens	Spotted Sandpiper Mourning Dove Downy Woodpecker
				Sturnus vulgaris Dendroica petechia Geothlypis trichas Passerculus	European Starling Yellow Warbler Common Yellowthroat		Empidonax traillii Hirundo rustica Turdus migratorius	Willow Flycatcher Barn Swallow American Robin
				sandwichensis Melospiza melodia Agelaius phoeniceus Carpodacus	Savannah Sparrow Song Sparrow Red winged Blackbird		<i>Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Passerculus</i>	European Starling Cedar Waxwing Yellow Warbler
				mexicanus Carduelis tristis	House Finch American Goldfinch		sandwichensis Melospiza melodia Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Icterus galbula Carpodacus mexicanus Carduelis tristis Passer domesticus	Savannah Sparrow Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Baltimore Oriole House Finch American Goldfinch House Sparrow

APPENDIX H RESULTS OF BIRD POINT COUNT SURVEYS

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
		North Chappus						
16	0329276E	Road	Jun 6	Charadrius vociferus	Killdeer	Jun 16	Actitis macularius	Spotted Sandpiper
	4682170N	Chappus Road		Actitis macularius	Spotted Sandpiper		Contopus virens	Eastern Wood Pewee
				Colaptes auratus	Northern Flicker		Vireo gilvus	Warbling Vireo
				Contopus virens	Eastern Wood Pewee		Cyanocitta cristata	Blue Jay
							Thryothorus	
				Tyrannus tyrannus	Eastern Kingbird		ludovicianus	Carolina Wren
				Vireo gilvus	Warbling Vireo		Troglodytes aedon	House Wren
				Thryothorus				
				ludovicianus	Carolina Wren		Turdus migratorius	American Robin
				Troglodytes aedon	House Wren		Dumetella carolinensis	Gray Catbird
				Hylocichla mustelina	Wood Thrush		Melospiza melodia	Song Sparrow
				Turdus migratorius	American Robin		Cardinalis cardinalis	Northern Cardinal
				Dumetella carolinensis	Gray Catbird		Agelaius phoeniceus	Red winged Blackbird
				Bombycilla cedrorum	Cedar Waxwing		Molothrus ater	Brown headed Cowbird
				Dendroica petechia	Yellow Warbler			
				Geothlypis trichas	Common Yellowthroat			
				Melospiza melodia	Song Sparrow			
				Cardinalis cardinalis	Northern Cardinal			
				Agelaius phoeniceus	Red winged Blackbird			
				Icterus galbula	Baltimore Oriole			
				Carduelis tristis	American Goldfinch			

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
		North Chappus						
17	0329380E 4681810N	Road	Jun 6	Charadrius vociferus Melanerpes carolinus Picoides pubescens Colaptes auratus Contopus virens Vireo gilvus Cyanocitta cristata Troglodytes aedon Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Melospiza melodia Cardinalis cardinalis Pheucticus	Killdeer Red bellied Woodpecker Downy Woodpecker Northern Flicker Eastern Wood Pewee Warbling Vireo Blue Jay House Wren American Robin Gray Catbird Cedar Waxwing Song Sparrow Northern Cardinal	Jun 16	Zenaida macroura Picoides pubescens Colaptes auratus Empidonax traillii Vireo gilvus Thryothorus ludovicianus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Melospiza melodia Cardinalis cardinalis	Mourning Dove Downy Woodpecker Northern Flicker Willow Flycatcher Warbling Vireo Carolina Wren House Wren American Robin Gray Catbird European Starling Yellow Warbler Song Sparrow Northern Cardinal
				<i>Iudovicianus Agelaius phoeniceus Quiscalus quiscula Icterus galbula</i>	Rose breasted Grosbeak Red winged Blackbird Common Grackle Baltimore Oriole		Pheucticus Iudovicianus Agelaius phoeniceus Molothrus ater Icterus galbula Carduolis trictis	Rose breasted Grosbeak Red winged Blackbird Brown headed Cowbird Baltimore Oriole
		North Channus						
18	0329745E 4681758N	Road ? Drain	Jun 6	Picoides pubescens Cyanocitta cristata Thryothorus Iudovicianus Troglodytes aedon Dumetella carolinensis Bombycilla cedrorum Pipilo erythrophthalmus Cardinalis cardinalis Passerina cyanea Quiscalus guiscula	Downy Woodpecker Blue Jay Carolina Wren House Wren Gray Catbird Cedar Waxwing Eastern Towhee Northern Cardinal Indigo Bunting Common Grackle	Jun 16	Phasianus colchicus Contopus virens Thryothorus Iudovicianus Troglodytes aedon Dumetella carolinensis Cardinalis cardinalis Passerina cyanea Molothrus ater	Ring necked Pheasant Eastern Wood Pewee Carolina Wren House Wren Gray Catbird Northern Cardinal Indigo Bunting Brown headed Cowbird

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
19	0329854E 4681940N	Chappus Woods	Jun 6	Zenaida macroura Colaptes auratus Empidonax traillii Thryothorus ludovicianus Turdus migratorius Sturnus vulgaris Dendroica petechia Geothlypis trichas Melospiza melodia Cardinalis cardinalis Pheucticus Iudovicianus Agelaius phoeniceus Molothrus ater Icterus galbula Carduelis tristis	Mourning Dove Northern Flicker Willow Flycatcher Carolina Wren American Robin European Starling Yellow Warbler Common Yellowthroat Song Sparrow Northern Cardinal Rose breasted Grosbeak Red winged Blackbird Brown headed Cowbird Baltimore Oriole American Goldfinch	Jun 16	Colaptes auratus Contopus virens Empidonax traillii Vireo gilvus Cyanocitta cristata Turdus migratorius Dumetella carolinensis Dendroica petechia Cardinalis cardinalis Pheucticus ludovicianus Agelaius phoeniceus Molothrus ater Icterus galbula Carduelis tristis	Northern Flicker Eastern Wood Pewee Willow Flycatcher Warbling Vireo Blue Jay American Robin Gray Catbird Yellow Warbler Northern Cardinal Rose breasted Grosbeak Red winged Blackbird Brown headed Cowbird Baltimore Oriole American Goldfinch
20	0329965E 4682016N	Chappus Woods	Jun 6	Archilochus colubris Empidonax traillii Vireo gilvus Cyanocitta cristata Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Geothlypis trichas Cardinalis cardinalis Agelaius phoeniceus Molothrus ater Carduelis tristis	Ruby throated Hummingbird Willow Flycatcher Warbling Vireo Blue Jay American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Common Yellowthroat Northern Cardinal Red winged Blackbird Brown headed Cowbird American Goldfinch	Jun 19	Empidonax traillii Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Geothlypis trichas Melospiza melodia Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Molothrus ater Carduelis tristis	Willow Flycatcher American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Common Yellowthroat Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Brown headed Cowbird American Goldfinch

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
21	0329615E 4682085N	Chappus Woods	Jun 6	Picoides pubescens Contopus virens Empidonax traillii Vireo gilvus Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Dendroica petechia Pipilo erythrophthalmus Spizella pusilla Melospiza melodia Cardinalis cardinalis Pheucticus ludovicianus Agelaius phoeniceus Molothrus ater Icterus galbula Carduelis tristis	Downy Woodpecker Eastern Wood Pewee Willow Flycatcher Warbling Vireo American Robin Gray Catbird Cedar Waxwing Yellow Warbler Eastern Towhee Field Sparrow Song Sparrow Northern Cardinal Rose breasted Grosbeak Red winged Blackbird Brown headed Cowbird Baltimore Oriole American Goldfinch	Jun 19	Picoides pubescens Empidonax traillii Tachycineta bicolor Thryothorus ludovicianus Turdus migratorius Dumetella carolinensis Dendroica petechia Spizella pusilla Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Icterus galbula	Downy Woodpecker Willow Flycatcher Tree Swallow Carolina Wren American Robin Gray Catbird Yellow Warbler Field Sparrow Song Sparrow Northern Cardinal Red winged Blackbird Baltimore Oriole
22	0329530E 4681940N	Chappus Woods	Jun 6	Phasianus colchicus Charadrius vociferus Melanerpes carolinus Sayornis phoebe Cyanocitta cristata Turdus migratorius Dumetella carolinensis Dendroica petechia Spizella pusilla Melospiza melodia Agelaius phoeniceus Icterus galbula Carduelis tristis	Ring necked Pheasant Killdeer Red bellied Woodpecker Eastern Phoebe Blue Jay American Robin Gray Catbird Yellow Warbler Field Sparrow Song Sparrow Red winged Blackbird Baltimore Oriole American Goldfinch	Jun 16	Empidonax traillii Tachycineta bicolor Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Melospiza melodia Cardinalis cardinalis Pheucticus ludovicianus Agelaius phoeniceus Molothrus ater	Willow Flycatcher Tree Swallow American Robin Gray Catbird European Starling Yellow Warbler Song Sparrow Northern Cardinal Rose breasted Grosbeak Red winged Blackbird Brown headed Cowbird

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
23	0329904E 4681595N	Chappus Woods	Jun 6	Anas platyrhynchos Picoides pubescens Contopus virens Thryothorus Iudovicianus Troglodytes aedon Hylocichla mustelina Turdus migratorius Dumetella carolinensis Cardinalis cardinalis Molothrus ater	Mallard Downy Woodpecker Eastern Wood Pewee Carolina Wren House Wren Wood Thrush American Robin Gray Catbird Northern Cardinal Brown headed Cowbird	Jun 16	Phasianus colchicus Thryothorus Iudovicianus Turdus migratorius Dumetella carolinensis Cardinalis cardinalis Dendroica petechia Agelaius phoeniceus	Ring necked Pheasant Carolina Wren American Robin Gray Catbird Northern Cardinal Yellow Warbler Red winged Blackbird
24	0330365E 4681700N	North Spring Garden	Jun 8	Aix sponsa Accipiter cooperii Picoides pubescens Contopus virens Vireo gilvus Troglodytes aedon Turdus migratorius Dendroica petechia Geothlypis trichas Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Icterus galbula	Wood Duck Cooper's Hawk Downy Woodpecker Eastern Wood Pewee Warbling Vireo House Wren American Robin Yellow Warbler Common Yellowthroat Song Sparrow Northern Cardinal Red winged Blackbird Baltimore Oriole	Jun 20	Accipiter cooperii Picoides pubescens Vireo olivaceus Poecile atricapillus Thryothorus ludovicianus Troglodytes aedon Turdus migratorius Dumetella carolinensis Melospiza melodia Cardinalis cardinalis Pheucticus ludovicianus Passerina cyanea Agelaius phoeniceus Molothrus ater Icterus galbula	Cooper's Hawk Downy Woodpecker Red eyed Vireo Black capped Chickadee Carolina Wren House Wren American Robin Gray Catbird Song Sparrow Northern Cardinal Rose breasted Grosbeak Indigo Bunting Red winged Blackbird Brown headed Cowbird Baltimore Oriole

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
25	0330402E 4681855N	North Spring Garden	Jun 8	Picoides pubescens Contopus virens Vireo gilvus Vireo olivaceus Troglodytes aedon Dumetella carolinensis Dendroica petechia Geothlypis trichas Melospiza melodia Agelaius phoeniceus	Downy Woodpecker Eastern Wood Pewee Warbling Vireo Red eyed Vireo House Wren Gray Catbird Yellow Warbler Common Yellowthroat Song Sparrow Red winged Blackbird	Jun 20	Picoides pubescens Colaptes auratus Contopus virens Vireo gilvus Troglodytes aedon Turdus migratorius Dumetella carolinensis Dendroica petechia Geothlypis trichas Melospiza melodia Agelaius phoeniceus Icterus galbula	Downy Woodpecker Northern Flicker Eastern Wood Pewee Warbling Vireo House Wren American Robin Gray Catbird Yellow Warbler Common Yellowthroat Song Sparrow Red winged Blackbird Baltimore Oriole
26	0330570E 4681804N	North Spring Garden	Jun 8	Poecile atricapillus Troglodytes aedon Turdus migratorius Dumetella carolinensis Dendroica petechia Cardinalis cardinalis Pheucticus ludovicianus Agelaius phoeniceus	Black capped Chickadee House Wren American Robin Gray Catbird Yellow Warbler Northern Cardinal Rose breasted Grosbeak Red winged Blackbird	Jun 20	Troglodytes aedon Hylocichla mustelina Dumetella carolinensis Bombycilla cedrorum Dendroica petechia Cardinalis cardinalis Agelaius phoeniceus Quiscalus quiscula Icterus galbula Carduelis tristis	House Wren Wood Thrush Gray Catbird Cedar Waxwing Yellow Warbler Northern Cardinal Red winged Blackbird Common Grackle Baltimore Oriole American Goldfinch

APPENDIX H RESULTS OF BIRD POINT COUNT SURVEYS

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
27	0330755E 4681670N	North Spring Garden	Jun 7	Cyanocitta cristata Poecile atricapillus Thryothorus Iudovicianus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Melospiza melodia Passerina cyanea Carduelis tristis	Blue Jay Black capped Chickadee Carolina Wren House Wren American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Song Sparrow Indigo Bunting American Goldfinch	Jun 20	Picoides pubescens Colaptes auratus Thryothorus Iudovicianus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Cardinalis cardinalis Quiscalus quiscula Molothrus ater Icterus galbula	Downy Woodpecker Northern Flicker Carolina Wren House Wren American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Northern Cardinal Common Grackle Brown headed Cowbird Baltimore Oriole
28	0330895E 4681745N	North Spring Garden	Jun 8	Gallinago delicata Picoides pubescens Turdus migratorius Dumetella carolinensis Dendroica petechia Cardinalis cardinalis Agelaius phoeniceus Icterus galbula Carduelis tristis	Wilson's Snipe Downy Woodpecker American Robin Gray Catbird Yellow Warbler Northern Cardinal Red winged Blackbird Baltimore Oriole American Goldfinch	Jun 20	Picoides pubescens Turdus migratorius Dumetella carolinensis Dendroica petechia Pipilo erythrophthalmus Cardinalis cardinalis Agelaius phoeniceus	Downy Woodpecker American Robin Gray Catbird Yellow Warbler Eastern Towhee Northern Cardinal Red winged Blackbird
29	0330978E 4681694N	North Spring Garden	Jun 8	Turdus migratorius Dumetella carolinensis Dendroica petechia Cardinalis cardinalis Agelaius phoeniceus	American Robin Gray Catbird Yellow Warbler Northern Cardinal Red winged Blackbird	Jun 20	Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Cardinalis cardinalis Agelaius phoeniceus	American Robin Gray Catbird European Starling Yellow Warbler Northern Cardinal Red winged Blackbird

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
30	0330585E 4681450N	Lambton	Jun 7	Zenaida macroura Picoides pubescens Tyrannus tyrannus Vireo gilvus Corvus brachyrhynchos Stelgidopteryx serripennis Hirundo rustica Troglodytes aedon Turdus migratorius Sturnus vulgaris Cardinalis cardinalis Agelaius phoeniceus Icterus galbula Carduelis tristis Passer domesticus	Mourning Dove Downy Woodpecker Eastern Kingbird Warbling Vireo American Crow Northern Rough winged Swallow Barn Swallow House Wren American Robin European Starling Northern Cardinal Red winged Blackbird Baltimore Oriole American Goldfinch House Sparrow	Jun 19	Zenaida macroura Vireo gilvus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Spizella passerina Spizella pusilla Agelaius phoeniceus Carpodacus mexicanus	Mourning Dove Warbling Vireo House Wren American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Chipping Sparrow Field Sparrow Red winged Blackbird House Finch
31	0330892E 4681394N	Lambton	Jun 7	Melanerpes carolinus Picoides pubescens Colaptes auratus <b>Tyrannus tyrannus</b> Vireo gilvus Cyanocitta cristata <b>Troglodytes aedon</b> <b>Turdus migratorius</b> Sturnus vulgaris Bombycilla cedrorum Melospiza melodia <b>Cardinalis cardinalis</b> <b>Ouiscalus quiscula</b> Icterus spurius Icterus galbula	Red bellied Woodpecker Downy Woodpecker Northern Flicker Eastern Kingbird Warbling Vireo Blue Jay House Wren American Robin European Starling Cedar Waxwing Song Sparrow Northern Cardinal Common Grackle Orchard Oriole Baltimore Oriole	Jun 20	Myiarchus crinitus Tyrannus tyrannus Vireo gilvus Troglodytes aedon Turdus migratorius Dumetella carolinensis Pipilo erythrophthalmus Spizella pusilla Cardinalis cardinalis Passerina cyanea Ouiscalus quiscula Molothrus ater Icterus galbula Carduelis tristis Passer domesticus	Great Crested Flycatcher Eastern Kingbird Warbling Vireo House Wren American Robin Gray Catbird Eastern Towhee Field Sparrow Northern Cardinal Indigo Bunting Common Grackle Brown headed Cowbird Baltimore Oriole American Goldfinch House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
32	0331247E 4681434N	Lambton	Jun 8	Zenaida macroura Picoides pubescens Turdus migratorius Dumetella carolinensis Sturnus vulgaris Icterus galbula Carduelis tristis Passer domesticus	Mourning Dove Downy Woodpecker American Robin Gray Catbird European Starling Baltimore Oriole American Goldfinch House Sparrow	Jun 19	Columba livia Zenaida macroura Picoides pubescens Cyanocitta cristata Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum	Rock Pigeon Mourning Dove Downy Woodpecker Blue Jay American Robin Gray Catbird European Starling Cedar Waxwing
33	0331450E 4681040N	Lambton	Jun 8	Buteo jamaicensis Picoides pubescens Vireo olivaceus Thryothorus Iudovicianus Turdus migratorius Dumetella carolinensis Cardinalis cardinalis Passerina cyanea Icterus galbula Carduelis tristis Passer domesticus	Red tailed Hawk Downy Woodpecker Red eyed Vireo Carolina Wren American Robin Gray Catbird Northern Cardinal Indigo Bunting Baltimore Oriole American Goldfinch House Sparrow	Jun 21	Charadrius vociferus Picoides pubescens Colaptes auratus Poecile atricapillus Thryothorus Iudovicianus Troglodytes aedon Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Pipilo erythrophthalmus Spizella passerina Cardinalis cardinalis Passerina cyanea Icterus galbula Carduelis tristis Passer domesticus	Killdeer Downy Woodpecker Northern Flicker Black capped Chickadee Carolina Wren House Wren American Robin Gray Catbird Cedar Waxwing Eastern Towhee Chipping Sparrow Northern Cardinal Indigo Bunting Baltimore Oriole American Goldfinch House Sparrow
34	0331678E 4680514N	North and South of Reddock Avenue	Jun 9	Tyrannus tyrannus Vireo gilvus Cyanocitta cristata Troglodytes aedon Cardinalis cardinalis Molothrus ater Icterus galbula	Eastern Kingbird Warbling Vireo Blue Jay House Wren Northern Cardinal Brown headed Cowbird Baltimore Oriole	Jun 23	<i>Cyanocitta cristata</i> <i>Troglodytes aedon</i> <i>Turdus migratorius</i> <i>Dumetella carolinensis</i> <i>Sturnus vulgaris</i> <i>Melospiza melodia</i> <i>Cardinalis cardinalis</i> <i>Passerina cyanea</i> <i>Agelaius phoeniceus</i> <i>Passer domesticus</i>	Blue Jay House Wren American Robin Gray Catbird European Starling Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird House Sparrow
APPENDIX H RESULTS OF BIRD POINT COUNT SURVEYS

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
35	0331780E 4680168N	North and South of Reddock Avenue	Jun 9	Zenaida macroura <b>Picoides pubescens</b> <b>Cyanocitta cristata</b> Poecile atricapillus Thryothorus ludovicianus <b>Troglodytes aedon</b> Hylocichla mustelina <b>Turdus migratorius</b> <b>Sturnus vulgaris</b> Cardinalis cardinalis Passerina cyanea Quiscalus quiscula <b>Molothrus ater</b> Carduelis tristis Passer domesticus	Mourning Dove Downy Woodpecker Blue Jay Black capped Chickadee Carolina Wren House Wren Wood Thrush American Robin European Starling Northern Cardinal Indigo Bunting Common Grackle Brown headed Cowbird American Goldfinch House Sparrow	Jun 23	Charadrius vociferus Columba livia Picoides pubescens Cyanocitta cristata Troglodytes aedon Turdus migratorius Sturnus vulgaris Spizella passerina Cardinalis cardinalis Molothrus ater	Killdeer Rock Pigeon Downy Woodpecker Blue Jay House Wren American Robin European Starling Chipping Sparrow Northern Cardinal Brown headed Cowbird
36	0331875E 4679910N	North and South of Reddock Avenue	Jun 9	Vireo gilvus Turdus migratorius Dumetella carolinensis Spizella passerina Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Quiscalus quiscula Molothrus ater Icterus galbula Carduelis tristis	Warbling Vireo American Robin Gray Catbird Chipping Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Common Grackle Brown headed Cowbird Baltimore Oriole American Goldfinch	Jun 23	Charadrius vociferus Tyrannus tyrannus Vireo gilvus Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Spizella passerina Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Icterus galbula Carduelis tristis	Killdeer Eastern Kingbird Warbling Vireo American Robin Gray Catbird European Starling Cedar Waxwing Chipping Sparrow Song Sparrow Northern Cardinal Red winged Blackbird Orchard Oriole Baltimore Oriole American Goldfinch

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
37	0332088E 4679970N	Oakwood Bush	Jun 9	Vireo gilvus Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Melospiza melodia Agelaius phoeniceus Icterus galbula Carduelis tristis	Warbling Vireo American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Song Sparrow Red winged Blackbird Baltimore Oriole American Goldfinch	Jun 23	Zenaida macroura Picoides pubescens Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Spizella passerina Melospiza melodia Agelaius phoeniceus Icterus galbula Carduelis tristis	Mourning Dove Downy Woodpecker American Robin Gray Catbird Cedar Waxwing Chipping Sparrow Song Sparrow Red winged Blackbird Baltimore Oriole American Goldfinch
38	0332157E 4679450N	Huron Church north of Cousineau Road	Jun 9	<i>Charadrius vociferus</i> Zenaida macroura Corvus brachyrhynchos <i>Turdus migratorius</i> <i>Sturnus vulgaris</i> <i>Molothrus ater</i> <i>Carpodacus mexicanus</i> <i>Carduelis tristis</i>	Killdeer Mourning Dove American Crow American Robin European Starling Brown headed Cowbird House Finch American Goldfinch	Jun 23	<i>Charadrius vociferus</i> <i>Actitis macularius</i> <i>Cyanocitta cristata</i> <i>Turdus migratorius</i> <i>Sturnus vulgaris</i> <i>Bombycilla cedrorum</i> <i>Melospiza melodia</i> <i>Icterus galbula</i> <i>Passer domesticus</i>	Killdeer Spotted Sandpiper Blue Jay American Robin European Starling Cedar Waxwing Song Sparrow Baltimore Oriole House Sparrow
39	0332494E 4679204N	Huron Church north of Cousineau Road	Jun 9	Zenaida macroura Vireo gilvus Vireo olivaceus Troglodytes aedon Turdus migratorius Sturnus vulgaris Melospiza melodia Cardinalis cardinalis Passerina cyanea Passer domesticus	Mourning Dove Warbling Vireo Red eyed Vireo House Wren American Robin European Starling Song Sparrow Northern Cardinal Indigo Bunting House Sparrow	Jun 23	Zenaida macroura Hirundo rustica Turdus migratorius Sturnus vulgaris Quiscalus quiscula Molothrus ater Carduelis tristis Passer domesticus	Mourning Dove Barn Swallow American Robin European Starling Common Grackle Brown headed Cowbird American Goldfinch House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
40	0332868E 4679067N	Huron Church north of Cousineau Road	Jun 9	Picoides pubescens Colaptes auratus Empidonax traillii Vireo olivaceus Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Cardinalis cardinalis Agelaius phoeniceus Icterus galbula Carduelis tristis	Downy Woodpecker Northern Flicker Willow Flycatcher Red eyed Vireo Gray Catbird European Starling Cedar Waxwing Yellow Warbler Northern Cardinal Red winged Blackbird Baltimore Oriole American Goldfinch	Jun 22	Zenaida macroura Picoides pubescens Colaptes auratus Empidonax traillii Poecile atricapillus Troglodytes aedon Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Dendroica petechia Spizella passerina Melospiza melodia Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Icterus galbula Carduelis tristis Passer domesticus	Mourning Dove Downy Woodpecker Northern Flicker Willow Flycatcher Black capped Chickadee House Wren American Robin Gray Catbird Cedar Waxwing Yellow Warbler Chipping Sparrow Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Baltimore Oriole American Goldfinch House Sparrow
41	0331607E 4680690N	North and South of Reddock Avenue	Jun 9	Ardea herodias Charadrius vociferus	Great Blue Heron Killdeer	Jun 22	Charadrius vociferus Petrochelidon pyrrhonota	Killdeer Cliff Swallow
				Petrochelidon pyrrhonota Hirundo rustica Turdus migratorius Dumetella carolinensis Agelaius phoeniceus Passer domesticus	Cliff Swallow Barn Swallow American Robin Gray Catbird Red winged Blackbird House Sparrow		<i>Hirundo rustica Sturnus vulgaris Agelaius phoeniceus Passer domesticus</i>	Barn Swallow European Starling Red winged Blackbird House Sparrow

APPENDIX H RESULTS OF BIRD POINT COUNT SURVEYS

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
42	0333138E 4678925N	Huron Church north of Cousineau Road	Jun 9	Empidonax traillii Poecile atricapillus Dendroica petechia Melospiza melodia Agelaius phoeniceus Molothrus ater Icterus galbula Carduelis tristis	Willow Flycatcher Black capped Chickadee Yellow Warbler Song Sparrow Red winged Blackbird Brown headed Cowbird Baltimore Oriole American Goldfinch	Jun 22	Zenaida macroura Empidonax traillii Hirundo rustica Poecile atricapillus Turdus migratorius Dumetella carolinensis Dendroica petechia Passerculus sandwichensis Melospiza melodia Agelaius phoeniceus Molothrus ater Carduelis tristis	Mourning Dove Willow Flycatcher Barn Swallow Black capped Chickadee American Robin Gray Catbird Yellow Warbler Savannah Sparrow Song Sparrow Red winged Blackbird Brown headed Cowbird American Goldfinch
43	0333435E 4678741N	Huron Church north of Cousineau Road	Jun 9	Zenaida macroura Colaptes auratus Sturnus vulgaris Melospiza melodia Agelaius phoeniceus Carduelis tristis Passer domesticus	Mourning Dove Northern Flicker European Starling Song Sparrow Red winged Blackbird American Goldfinch House Sparrow	Jun 23	Charadrius vociferus Zenaida macroura Stelgidopteryx serripennis Hirundo rustica Melospiza melodia Agelaius phoeniceus Carduelis tristis	Killdeer Mourning Dove Northern Rough winged Swallow Barn Swallow Song Sparrow Red winged Blackbird American Goldfinch
44	0332450E 4679410N	St. Clair College ESA	Jun 13	Zenaida macroura Turdus migratorius Bombycilla cedrorum Melospiza melodia Cardinalis cardinalis Quiscalus quiscula Molothrus ater Carpodacus mexicanus Carduelis tristis Passer domesticus	Mourning Dove American Robin Cedar Waxwing Song Sparrow Northern Cardinal Common Grackle Brown headed Cowbird House Finch American Goldfinch House Sparrow	Jun 22	Zenaida macroura Hirundo rustica Turdus migratorius Sturnus vulgaris Spizella passerina Cardinalis cardinalis Ouiscalus quiscula Molothrus ater Carpodacus mexicanus Carduelis tristis Passer domesticus	Mourning Dove Barn Swallow American Robin European Starling Chipping Sparrow Northern Cardinal Common Grackle Brown headed Cowbird House Finch American Goldfinch House Sparrow

APPENDIX H RESULTS OF BIRD POINT COUNT SURVEYS

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
45	0333225E 4679040N	St. Clair College ESA	Jun 13	Anas platyrhynchos Picoides pubescens Colaptes auratus Contopus virens Vireo olivaceus Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Geothlypis trichas Spizella passerina Melospiza melodia Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Molothrus ater Carduelis tristis Passer domesticus	Mallard Downy Woodpecker Northern Flicker Eastern Wood Pewee Red eyed Vireo American Robin Gray Catbird European Starling Yellow Warbler Common Yellowthroat Chipping Sparrow Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Brown headed Cowbird American Goldfinch House Sparrow	Jun 22	Anas platyrhynchos Zenaida macroura Picoides pubescens Colaptes auratus Vireo olivaceus Stelgidopteryx serripennis Hirundo rustica Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Spizella passerina Spizella passerina Spizella pusilla Melospiza melodia Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Quiscalus quiscula Molothrus ater Icterus galbula Carduelis tristis Passer domesticus	Mallard Mourning Dove Downy Woodpecker Northern Flicker Red eyed Vireo Northern Rough winged Swallow Barn Swallow House Wren American Robin Gray Catbird European Starling Cedar Waxwing Yellow Warbler Chipping Sparrow Field Sparrow Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Common Grackle Brown headed Cowbird Baltimore Oriole American Goldfinch House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
46	0334535E 4678090N	Montgomery Drive at Talbot Road	Jun 13	Zenaida macroura Cyanocitta cristata Thryothorus Iudovicianus	Mourning Dove Blue Jay Carolina Wren	Jun 23	Zenaida macroura Picoides pubescens Cyanocitta cristata	Mourning Dove Downy Woodpecker Blue Jay
				Troglodytes aedon Turdus migratorius Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Spizella passerina Cardinalis cardinalis Quiscalus quiscula Molothrus ater Passer domesticus	House Wren American Robin European Starling Cedar Waxwing Yellow Warbler Chipping Sparrow Northern Cardinal Common Grackle Brown headed Cowbird House Sparrow		Thryothorus Iudovicianus Troglodytes aedon Turdus migratorius Sturnus vulgaris Spizella passerina Cardinalis cardinalis Quiscalus quiscula Carduelis tristis Passer domesticus	Carolina Wren House Wren American Robin European Starling Chipping Sparrow Northern Cardinal Common Grackle American Goldfinch House Sparrow
47	0335150E 4677610N	Howard Avenue at Talbot Road	Jun 13	Zenaida macroura Cyanocitta cristata Troglodytes aedon Turdus migratorius Sturnus vulgaris Bombycilla cedrorum Cardinalis cardinalis Agelaius phoeniceus Ouiscalus quiscula Passer domesticus	Mourning Dove Blue Jay House Wren American Robin European Starling Cedar Waxwing Northern Cardinal Red winged Blackbird Common Grackle House Sparrow	Jun 24	Zenaida macroura Picoides pubescens Turdus migratorius Agelaius phoeniceus Ouiscalus quiscula Molothrus ater Passer domesticus	Mourning Dove Downy Woodpecker American Robin Red winged Blackbird Common Grackle Brown headed Cowbird House Sparrow
48	0335560E 4677615N	Highway 401 and Talbot Road	Jun 13	Zenaida macroura Empidonax traillii Troglodytes aedon Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Carduelis tristis	Mourning Dove Willow Flycatcher House Wren Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird American Goldfinch	Jun 22	Bombycilla cedrorum Dendroica petechia Melospiza melodia Agelaius phoeniceus Carduelis tristis Passer domesticus	Cedar Waxwing Yellow Warbler Song Sparrow Red winged Blackbird American Goldfinch House Sparrow

APPENDIX H
<b>RESULTS OF BIRD POINT COUNT SURVEYS</b>

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
49	0335700E 4677560N	Highway 401 and Talbot Road	Jun 13	Charadrius vociferus Zenaida macroura Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Melospiza melodia Agelaius phoeniceus Quiscalus quiscula Molothrus ater Carduelis tristis	Killdeer Mourning Dove American Robin Gray Catbird European Starling Yellow Warbler Song Sparrow Red winged Blackbird Common Grackle Brown headed Cowbird American Goldfinch	Jun 22	Branta canadensis Anas platyrhynchos Charadrius vociferus Zenaida macroura Turdus migratorius Sturnus vulgaris Bombycilla cedrorum Dendroica petechia Melospiza melodia Cardinalis cardinalis Passerina cyanea Agelaius phoeniceus Quiscalus quiscula Carduelis tristis	Canada Goose Mallard Killdeer Mourning Dove American Robin European Starling Cedar Waxwing Yellow Warbler Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Common Grackle American Goldfinch
50	0336070E 4677385N	Highway 401 and Talbot Road	Jun 12	Anas platyrhynchos Charadrius vociferus Actitis macularius Eremophila alpestris Turdus migratorius Passerculus sandwichensis Passer domesticus	Mallard Killdeer Spotted Sandpiper Horned Lark American Robin Savannah Sparrow House Sparrow	Jun 24	Anas platyrhynchosArdea albaCharadrius vociferusZenaida macrouraEremophila alpestrisSturnus vulgarisPasserculussandwichensisMelospiza melodiaCardinalis cardinalisAgelaius phoeniceusMolothrus aterPasser domesticus	Mallard         Great Egret         Killdeer         Mourning Dove         Horned Lark         European Starling         Savannah Sparrow         Song Sparrow         Northern Cardinal         Red winged Blackbird         Brown headed Cowbird         House Sparrow

APPENDIX H
<b>RESULTS OF BIRD POINT COUNT SURVEYS</b>

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
51	0335677E 4677070N	Highway 401 and Talbot Road	Jun 12	Charadrius vociferus Zenaida macroura Tyrannus tyrannus Eremophila alpestris Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Molothrus ater Carduelis tristis	Killdeer Mourning Dove Eastern Kingbird Horned Lark American Robin Gray Catbird Cedar Waxwing Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird Brown headed Cowbird American Goldfinch	Jun 24	Charadrius vociferus Zenaida macroura Tyrannus tyrannus Eremophila alpestris Turdus migratorius Dumetella carolinensis Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Molothrus ater Carduelis tristis	Killdeer Mourning Dove Eastern Kingbird Horned Lark American Robin Gray Catbird Song Sparrow Northern Cardinal Red winged Blackbird Brown headed Cowbird American Goldfinch
52	0335503E 4676542N	Highway 401 and Talbot Road	Jun 12	Buteo jamaicensis Charadrius vociferus Picoides pubescens Cyanocitta cristata Eremophila alpestris Troglodytes aedon Turdus migratorius Dumetella carolinensis Toxostoma rufum Sturnus vulgaris Pipilo erythrophthalmus Pooecetes gramineus Melospiza melodia Cardinalis cardinalis Passerina cyanea Quiscalus quiscula Molothrus ater Carduelis tristis Passer domesticus	Red tailed Hawk Killdeer Downy Woodpecker Blue Jay Horned Lark House Wren American Robin Gray Catbird Brown Thrasher European Starling Eastern Towhee Vesper Sparrow Song Sparrow Northern Cardinal Indigo Bunting Common Grackle Brown headed Cowbird American Goldfinch House Sparrow	Jun 24	<i>Eremophila alpestris</i> <i>Hirundo rustica</i> <i>Turdus migratorius</i> <i>Dumetella carolinensis</i> <i>Sturnus vulgaris</i> <i>Pooecetes gramineus</i> <i>Passerculus</i> <i>sandwichensis</i> <i>Melospiza melodia</i> <i>Cardinalis cardinalis</i> <i>Passerina cyanea</i> <i>Agelaius phoeniceus</i> <i>Quiscalus quiscula</i> <i>Icterus galbula</i> <i>Passer domesticus</i>	Horned Lark Barn Swallow American Robin Gray Catbird European Starling Vesper Sparrow Savannah Sparrow Song Sparrow Northern Cardinal Indigo Bunting Red winged Blackbird Common Grackle Baltimore Oriole House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
53	0336544E 4677424N	Highway 401 and Talbot Road	Jun 13	Zenaida macroura Turdus migratorius Sturnus vulgaris Bombycilla cedrorum Spizella passerina Agelaius phoeniceus Quiscalus quiscula Carduelis tristis Passer domesticus	Mourning Dove American Robin European Starling Cedar Waxwing Chipping Sparrow Red winged Blackbird Common Grackle American Goldfinch House Sparrow	Jun 24	Turdus migratorius Sturnus vulgaris Spizella passerina Passerculus sandwichensis Melospiza melodia Cardinalis cardinalis Passerina cyanea Quiscalus quiscula Molothrus ater Carpodacus mexicanus Carduelis tristis Passer demostiavo	American Robin European Starling Chipping Sparrow Savannah Sparrow Song Sparrow Northern Cardinal Indigo Bunting Common Grackle Brown headed Cowbird House Finch American Goldfinch
54	0336709E 4677960N	Highway 401 and Talbot Road	Jun 13	<i>Charadrius vociferus</i> <i>Actitis macularius</i> <i>Sturnus vulgaris</i> <i>Agelaius phoeniceus</i> <i>Quiscalus quiscula</i> <i>Passer domesticus</i>	Killdeer Spotted Sandpiper European Starling Red winged Blackbird Common Grackle House Sparrow	Jun 24	Passer domesticusCharadrius vociferusColumba liviaZenaida macrouraTurdus migratoriusSturnus vulgarisBombycilla cedrorumMelospiza melodiaAgelaius phoeniceusOuiscalus quisculaCarduelis tristisPasser domesticus	House sparrow         Killdeer         Rock Pigeon         Mourning Dove         American Robin         European Starling         Cedar Waxwing         Song Sparrow         Red winged Blackbird         Common Grackle         American Goldfinch         House Sparrow
55	0327740E 4683580N	Brighton Beach area / Prospect Avenue	Jun 14	Charadrius vociferus Tyrannus tyrannus Vireo gilvus Hirundo rustica Turdus migratorius Dendroica petechia Melospiza melodia Agelaius phoeniceus Passer domesticus	Killdeer Eastern Kingbird Warbling Vireo Barn Swallow American Robin Yellow Warbler Song Sparrow Red winged Blackbird House Sparrow	Jun 24	Tyrannus tyrannus Vireo gilvus Hirundo rustica Turdus migratorius Dendroica petechia Melospiza melodia Agelaius phoeniceus	Eastern Kingbird Warbling Vireo Barn Swallow American Robin Yellow Warbler Song Sparrow Red winged Blackbird

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
56	0328260E 4684385N	Brighton Beach area / Russell Drive	Jun 14	Picoides pubescens Vireo olivaceus Thryothorus ludovicianus Troglodytes aedon Turdus migratorius Dumetella carolinensis Sturnus vulgaris Bombycilla cedrorum Melospiza melodia Cardinalis cardinalis Passerina cyanea Molothrus ater Icterus galbula Passer domesticus	Downy Woodpecker Red eyed Vireo Carolina Wren House Wren American Robin Gray Catbird European Starling Cedar Waxwing Song Sparrow Northern Cardinal Indigo Bunting Brown headed Cowbird Baltimore Oriole House Sparrow	Jun 24	Accipiter cooperii Columba livia Zenaida macroura Vireo olivaceus Cyanocitta cristata Troglodytes aedon Turdus migratorius Sturnus vulgaris Bombycilla cedrorum Melospiza melodia Cardinalis cardinalis Passerina cyanea Passer domesticus	Cooper's Hawk Rock Pigeon Mourning Dove Red eyed Vireo Blue Jay House Wren American Robin European Starling Cedar Waxwing Song Sparrow Northern Cardinal Indigo Bunting House Sparrow
57	0329565E 4682340N	Malden Park	Jun 14	Vireo gilvus Turdus migratorius Dumetella carolinensis Sturnus vulgaris Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Carduelis tristis	Warbling Vireo American Robin Gray Catbird European Starling Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird American Goldfinch	Jun 29	Vireo gilvus Troglodytes aedon Turdus migratorius Dumetella carolinensis Dendroica petechia Melospiza melodia Cardinalis cardinalis Agelaius phoeniceus Molothrus ater Carduelis tristis	Warbling Vireo House Wren American Robin Gray Catbird Yellow Warbler Song Sparrow Northern Cardinal Red winged Blackbird Brown headed Cowbird American Goldfinch

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
58	0329975E 4682225N	Malden Park	Jun 14	Zenaida macroura Picoides pubescens Contopus virens Tyrannus tyrannus Vireo gilvus Cyanocitta cristata Turdus migratorius Bombycilla cedrorum Dendroica petechia Spizella passerina Passerina cyanea Agelaius phoeniceus Molothrus ater Icterus galbula Carduelis tristis	Mourning Dove Downy Woodpecker Eastern Wood Pewee Eastern Kingbird Warbling Vireo Blue Jay American Robin Cedar Waxwing Yellow Warbler Chipping Sparrow Indigo Bunting Red winged Blackbird Brown headed Cowbird Baltimore Oriole American Goldfinch	Jun 29	Picoides pubescens Colaptes auratus Contopus virens Tyrannus tyrannus Vireo gilvus Stelgidopteryx serripennis Turdus migratorius Dumetella carolinensis Bombycilla cedrorum Dendroica petechia Geothlypis trichas Melospiza melodia Cardinalis cardinalis Passerina cyanea Molothrus ater Icterus spurius Icterus galbula Carduelis tristis	Downy Woodpecker Northern Flicker Eastern Wood Pewee Eastern Kingbird Warbling Vireo Northern Rough winged Swallow American Robin Gray Catbird Cedar Waxwing Yellow Warbler Common Yellowthroat Song Sparrow Northern Cardinal Indigo Bunting Brown headed Cowbird Orchard Oriole Baltimore Oriole American Goldfinch
59	0328635E 4682425N	Yawkey / Ojibway and EC Row	Jun 13	Buteo jamaicensis Tyrannus tyrannus Turdus migratorius Sturnus vulgaris Dendroica petechia Geothlypis trichas Melospiza melodia Agelaius phoeniceus Carduelis tristis	Red tailed Hawk Eastern Kingbird American Robin European Starling Yellow Warbler Common Yellowthroat Song Sparrow Red winged Blackbird American Goldfinch	Jun 29	Buteo jamaicensis Zenaida macroura Tyrannus tyrannus Turdus migratorius Bombycilla cedrorum Dendroica petechia Geothlypis trichas Melospiza melodia Passerina cyanea Agelaius phoeniceus Molothrus ater Carpodacus mexicanus Carduelis tristis Passer domesticus	Red tailed Hawk Mourning Dove Eastern Kingbird American Robin Cedar Waxwing Yellow Warbler Common Yellowthroat Song Sparrow Indigo Bunting Red winged Blackbird Brown headed Cowbird House Finch American Goldfinch House Sparrow

Site #	UTM's	Location	Date (2006)	Species	Common Name	Date (2006)	Species	Common Name
60	0328430E	Yawkey /	Jun 13	Picoides pubescens	Downy Woodpecker	Jun 29	Picoides pubescens	Downy Woodpecker
	4682450N	Ojibway and		Empidonax traillii	Willow Flycatcher		Empidonax traillii	Willow Flycatcher
		EC Row		Tyrannus tyrannus	Eastern Kingbird		Vireo gilvus	Warbling Vireo
							Thryothorus	
				Vireo gilvus	Warbling Vireo		ludovicianus	Carolina Wren
				Thryothorus	-			
				ludovicianus	Carolina Wren		Turdus migratorius	American Robin
				Turdus migratorius	American Robin		Dumetella carolinensis	Gray Catbird
				Dumetella carolinensis	Gray Catbird		Sturnus vulgaris	European Starling
				Dendroica petechia	Yellow Warbler		Cardinalis cardinalis	Northern Cardinal
				Melospiza melodia	Song Sparrow		Agelaius phoeniceus	Red winged Blackbird
				Agelaius phoeniceus	Red winged Blackbird		Molothrus ater	Brown headed Cowbird
				Passer domesticus	House Sparrow		Passer domesticus	House Sparrow

Bold denotes verified breeding (species observed at both visits)



Reference Number	Location	Habitats (ELC's)		Significant Wildlife	Habitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-BBA1	Brighton Beach Area	CUM	No evidence	No areas that would contain wildlife uncommon or rare	Unable to verify	Unable to confirm mammal corridors	Not able to verify – no access to property
W-BBA2	Brighton Beach Area	FOD	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	Unable to verify	<ul> <li>Unable to confirm mammal corridors</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Not able to verify – no access to property</li> </ul>
W-BBA3	Brighton Beach Area	FOD	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	Cooper's Hawk	Unable to confirm mammal corridors	<ul> <li>Not able to verify if Cooper's Hawk nesting or other wildlife species present – no access to property</li> </ul>
W-BBA4	Brighton Beach Area	CUW	<ul> <li>Land bird migratory stopover area</li> </ul>	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	<ul><li>Cooper's Hawk</li><li>Gray Catbird</li></ul>	<ul> <li>East-west mammal corridor s connecting residences on east side to factory property on west side</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	<ul> <li>Red Fox pups observed on factory property, opposite CUW, along tree row at south end of factory</li> <li>Cooper's Hawk, although observed in CUW, not nesting there</li> </ul>
W-BBA5	Brighton Beach Area	CUW	<ul> <li>Land bird migratory stopover area</li> </ul>	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>mammal corridors connecting CUW with surrounding industrial property</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	Human adapted wildlife in area
W-BBA6	Brighton Beach Area	MAM	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>East-west mammal corridor from MAM to factory property west of Ojibway Parkway at south end of Russell Street</li> </ul>	Human adapted wildlife in area
W-BBA7	Brighton Beach Area	CUW	Unable to verify	Unable to verify	Unable to verify	Unable to verify	<ul> <li>Not able to verify – no access to property</li> </ul>
W-BBA8	Brighton Beach Area	CUM	Land bird migratory stopover area	Habitat for breeding birds of conservation concern	Eastern Kingbird	Unable to verify	Few observations made from outside fenced-in property
W-BBA9	Brighton Beach Area	CUS	<ul> <li>Land bird migratory stopover area</li> </ul>	Grasslands and forest in area	<ul><li>Carolina Wren</li><li>Gray Catbird</li><li>American Goldfinch</li></ul>	<ul> <li>North-south corridor for red fox, raccoon, skunk and white-tailed deer moving through CUS.</li> <li>One section of a larger bird migration corridor that extends north-south along east side of Detroit River</li> </ul>	<ul> <li>Numerous species of wildlife use the area for feeding</li> <li>Red fox den located on Ontario Hydro property just north of BBA9</li> <li>Brown snakes located in open area along north edge of FOD</li> <li>Large number of migratory bird nests</li> </ul>
WBBA10	Brighton Beach Area	CUW	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal movement corridor along north forest edge</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	<ul> <li>Foraging area for birds and mammals</li> </ul>
WBBA11	Brighton Beach Area	CUS	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal movement corridors along roadsides and through CUS</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	Foraging area for birds and mammals
WBBA12	Brighton Beach Area	CUM	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal movement corridors along roadsides and through CUM</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	<ul> <li>Foraging area for birds and mammals</li> </ul>

Reference Number	Location	Habitats (ELC's)		Significant Wildlife	Habitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
WBBA13	Brighton Beach Area	CUS	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> <li>Habitat for breeding birds of conservation concern</li> </ul>	Gray Catbird	<ul> <li>Mammal movement corridors along roadsides and through CUM</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	<ul> <li>Foraging area for birds and mammals</li> <li>Deer bedding area in southeast corner</li> </ul>
WBBA14	Brighton Beach Area	СИМ	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Some evidence of north-south mammal movement corridors through CUM</li> </ul>	<ul> <li>Other than white-tailed deer and some small mammal activity, this area has limited amounts of wildlife due to its proximity to the highway</li> </ul>
WBBA15	Brighton Beach Area	CUS	Land bird migratory stopover area	<ul> <li>Nno areas that would contain wildlife uncommon or rare</li> <li>No forested areas</li> </ul>	<ul> <li>No species of conservation concern were recorded</li> </ul>	<ul> <li>North-south corridor for red fox, raccoon, skunk and white-tailed deer moving through CUM</li> <li>Small part of migration corridor along Detroit River for migrating birds.</li> </ul>	Feeding zone for migrating birds.
WBBA16	Brighton Beach Area	FOD	<ul> <li>Land bird migratory stopover area</li> <li>Potential winter deer yard</li> <li>Amphibian breeding ponds in spring</li> </ul>	<ul> <li>Forest contains trees with numerous nest cavities deadfalls for breeding birds and mammals</li> <li>Pond inside forest for breeding amphibians</li> </ul>	<ul> <li>American Goldfinch</li> <li>Carolina Wren</li> <li>Gray Catbird</li> </ul>	<ul> <li>Mammal corridors for white-tailed deer, red fox, raccoon, and skunk</li> <li>One section of a larger bird migration corridor that extends north-south along east side of Detroit River</li> </ul>	<ul> <li>Breeding area for many species of migratory birds</li> <li>Amphibian breeding pond inside forest</li> </ul>
WBBA17	Brighton Beach Area	CUM, TPO	Land bird migratory stopover area	Habitat for breeding birds of conservation concern	<ul><li>Brown Thrasher</li><li>American Goldfinch</li></ul>	<ul> <li>East-west corridor for red fox, raccoon and white-tailed deer moving along south side of CUM</li> <li>Small part of migration corridor along Detroit River for migrating birds.</li> </ul>	<ul> <li>Feeding zone for migrating birds</li> <li>Brown snake and red-bellied snake located along roadside at west end of CUM</li> </ul>
WBBA18	Brighton Beach Area	CUT	Land bird migratory stopover area	Habitat for breeding birds of conservation concern	<ul><li>Gray Catbird</li><li>American Goldfinch</li><li>Carolina Wren</li></ul>	<ul> <li>Mammal corridors for white-tailed deer, red fox, raccoon, and skunk</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	<ul> <li>Breeding area for migratory birds</li> </ul>
WBBA19	Brighton Beach Area	CUM	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	<ul> <li>no species of conservation concern were recorded</li> </ul>	<ul> <li>White-tailed deer corridor along northeast side of CUM</li> <li>Coyote, fox and raccoon corridor along roadway on east side of CUM</li> </ul>	<ul> <li>Green frogs in ditches along north edge of CUM</li> </ul>
WBBA20	Brighton Beach Area	CUM	Land bird migratory stopover area	<ul> <li>Lots of fall seed plants for passerine migrants to forage on</li> </ul>	<ul><li>Gray Catbird</li><li>American Goldfinch</li></ul>	<ul> <li>East-west mammal movement corridors along north and south sides of CUM</li> <li>Small part of migration corridor along Detroit River for migrating birds</li> </ul>	<ul> <li>Fall season foraging area for migrating birds</li> </ul>
WBBA21	Brighton Beach Area	CUW	Potential land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	Not able to verify – no access to property	Unable to confirm mammal corridors	<ul> <li>Not able to verify – no access to property</li> </ul>

Reference Number	Location	Habitats (ELC's)		Significant Wildlife	łabitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-ANS1	ANSI south of Broadway St	TPW	<ul> <li>Land bird migratory stopover area</li> <li>Summer white-tailed deer bedding areas</li> <li>Potential winter deer yard</li> </ul>	<ul> <li>Habitat for breeding birds of conservation concern</li> <li>Forest contains trees with numerous nest cavities for breeding birds and mammals</li> </ul>	<ul> <li>American Goldfinch</li> <li>Gray Catbird</li> <li>Red-headed Woodpecker</li> </ul>	<ul> <li>Mammal corridors throughout ANSI for white-tailed deer, raccoon, red fox, coyote, striped skunk and opossum.</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>ANSI</li> <li>Deer bedding area</li> <li>Red-headed Woodpecker is SARA species</li> </ul>
W-YWK1	Yawkey	CUM	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	East-west mammal corridor through center of CUM	This area has limited amounts of wildlife due to its proximity to the highway
W-YWK2	Yawkey	CUW	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>East-west mammal corridors through CUW</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>This area has limited amounts of wildlife due to its proximity to the highway and human disturbance</li> </ul>
W-YWK3	Yawkey	CUM	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>North-south mammal corridors through CUM</li> </ul>	<ul> <li>This area has limited amounts of wildlife due to its proximity to the highway and human disturbance</li> </ul>
W-YWK4	Yawkey	MAS	No evidence	Habitat for breeding birds of conservation concern	Gray Catbird	<ul> <li>North-south mammal corridors through CUM</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>This area has limited amounts of wildlife due to its proximity to the highway and human disturbance</li> </ul>
W-YWK5	Yawkey	CUW	Land bird migratory stopover area	Habitat for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Gray Catbird</li></ul>	<ul> <li>Numerous north-south mammal corridors from residences to CUW, through to ANSI</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Garter snakes found in north end of CUW</li> <li>Although it is surrounded by human disturbances, it offers good habitat for foraging and nesting</li> </ul>
W-YWK6	Yawkey	CUW	Land bird migratory stopover area	Habitat for breeding birds of conservation concern	Red-tailed Hawk	<ul> <li>East-west mammal corridors through CUW</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Active Red-tailed Hawk nest in woodlot</li> </ul>
W-YWK7	Yawkey	CUM	Land bird migratory stopover area	Habitat for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Eastern Kingbird</li></ul>	<ul> <li>White-tailed deer and coyote corridor along east-west ridge on north side of CUM</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Minimal wildlife due to landfill site adjacent to CUM</li> </ul>
W-YWK8	Yawkey	МАМ	Land bird migratory stopover area	Habitat for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Eastern Kingbird</li></ul>	<ul> <li>Mammal corridors along ditch area in marsh parallel to EC Row Expressway</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Chain-link fence on north side parallel to EC Row Expressway and Ojibway Parkway intersection limits movement of mammals north-south
W-CH1	Chappus Street Area	СИМ	Potential snake hibernaculum	<ul> <li>Habitat suitable for breeding birds of conservation concern and snakes</li> </ul>	Spotted Sandpiper	<ul> <li>East-west mammal corridors connecting Matchette Road west to CUW east</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Possible garter snake hibernaculum at west end of CUM under tree</li> </ul>

Reference Number	Location	Habitats (ELC's)		Significant Wildlife H	labitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-CH2	Chappus Street Area	FOD, CUW, CUS	<ul> <li>Land bird migratory stopover area</li> <li>Amphibian breeding areas in creek drains</li> </ul>	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> <li>Temporary creek drains</li> </ul>	<ul> <li>Carolina Wren</li> <li>Eastern Towhee</li> <li>Gray Catbird</li> <li>Spotted Sandpiper</li> </ul>	<ul> <li>Large continuous corridor of mammal trails extending from Matchete Road and EC Row Expressway in the northwest to Malden Road and Spring Garden Road in the southeast</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Creeks running east-west and north-south through center of corridor were breeding areas for American Toad, leopard frog and green frog.</li> <li>Potential Cooper's Hawk nesting site in CUW at south end of corridor (pair very active in spring around previous nest site).</li> </ul>
W-CH3	Chappus Street Area	TPO	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	Minor mammal corridors east-west	<ul> <li>White-tailed deer bedding areas around the CUT 's in the TPO area</li> <li>no movement of mammals north due to chain-linked fence along EC Row Expressway</li> </ul>
W-CH4	Chappus Street Area	CUT	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	<ul><li>American Goldfinch</li><li>Gray Catbird</li><li>Ruby-throated Hummingbird</li></ul>	<ul> <li>Mammal corridors connecting surrounding CUW's and CUT's</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Human influenced by motorbike trails throughout the area</li> <li>Creek drain flows parallel to south side of CUT</li> </ul>
W-CH5	Chappus Street Area	CUT	No evidence	No areas that would contain wildlife uncommon     or rare	No species of conservation concern were recorded	No evidence	•
W-CH6	Chappus Street Area	CUP	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	no evidence	•
W-CH7	Chappus Street Area	CUW, SWD	<ul> <li>Land bird migratory stopover area</li> </ul>	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	<ul> <li>No species of conservation concern were recorded</li> </ul>	<ul> <li>East-west mammal corridor along north side of CUW1 and SWD parallel to fence line</li> <li>Small part of larger north-south bird migration corridor continuous with Malden Park Forest on north side of EC Row Expressway</li> </ul>	<ul> <li>No mammal corridors going north due to chain-linked fence along EC Row Expressway</li> </ul>
W-CH8	Chappus Street Area	CUM	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Gray Catbird</li></ul>	<ul> <li>East-west mammal corridor connecting CUW on the west side to residences on the east side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	•
W-CH9	Chappus Street Area	CUT	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	Gray Catbird	<ul> <li>Mammal corridors connecting two CUW's on east and west sides</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Good area for breeding birds to nest
W-CH10	Chappus Street Area	TPO	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> <li>Habitat suitable for snakes protected by SARA</li> </ul>	<ul><li>Butler's Garter Snake</li><li>Field Sparrow</li></ul>	<ul> <li>White-tailed deer, coyote and raccoon corridors connecting CUS and CUT north of area to CUT and CUW south and east of area</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Butler's Garter Snake is a SARA species</li> <li>It was only found in the TPO's of this section of the AOI.</li> </ul>

Reference Number	Location	Habitats (ELC's)		Significant Wildlife	Habitat	
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corrid
W-CH11	Chappus Street Area	СИТ	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul> <li>American Goldfinch</li> <li>Eastern Towhee</li> <li>Field Sparrow</li> <li>Gray Catbird</li> </ul>	<ul> <li>Mammal corridors east-west CUT and north-south connect with CUW1</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-CH12	Chappus Street Area	СИМ	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern and snakes	<ul><li>American Goldfinch</li><li>Carolina Wren</li></ul>	<ul> <li>Mammal and snake corridors connecting area toCUW1 an drain in center and CUW1 or east and west sides</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-CH13	Chappus Street Area	СИТ	Land bird migratory stopover area	<ul> <li>habitat for breeding birds of conservation concern</li> </ul>	<ul> <li>American Goldfinch</li> <li>Carolina Wren</li> <li>Eastern Phoebe</li> <li>Gray Catbird</li> </ul>	<ul> <li>White-tailed deer, coyote and corridors connecting CUT and north and south of area</li> <li>Continuation of snake corride</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-CH14	Chappus Street Area	TPO	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> <li>Habitat suitable for snakes protected by SARA</li> </ul>	<ul> <li>Butler's Garter Snake</li> <li>American Goldfinch</li> <li>Field Sparrow</li> </ul>	<ul> <li>White-tailed deer, coyote and corridors connecting FOD a north and south of area</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-CH15	Chappus Street Area	FOD	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	No evidence
W-CH16	Chappus Street Area	CUT	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Minor mammal corridors between FOD's and residences</li> <li>Small part of larger north-somigration corridor</li> </ul>
W-CH17	Chappus Street Area	СИМ	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal corridors connectin east side to CUT1 on south</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-CH18	Chappus Street Area	МАМ	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal corridors connectin surrounding CUT's to CUM of side</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-CH19	Chappus Street Area	FOD	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal corridors connectin residence yards in south to FOD in north</li> <li>Small part of larger north-so migration corridor</li> </ul>

	Comments
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t through cting TPO puth bird	•
s Id creek n south,	<ul> <li>Garter snakes and Brown snakes inhabit area</li> <li>Mammals adapted to human activity using walking trails</li> </ul>
outh bird	and 4x4 vehicle trails as corrigons
d raccoon nd FOD ors in TPO	Habitat connection with TPO that contains Butler's Garter Snake
outh bird	White-tailed deer beds in east end of area
d raccoon nd CUT outh bird	<ul> <li>Butler's Garter Snake is a SARA species</li> <li>It was only found in the TPO's of this section of the AOI.</li> </ul>
	Human influenced area
ween outh bird	Human influenced area
ig MAM on side outh bird	•
ig on east outh bird	•
ig MAM and puth bird	Human influenced area

Reference Number	Location	Habitats (ELC's)		Significant Wildlife	Habitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-CH20	Chappus Street Area	MAM	No evidence	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	American Woodcock	<ul> <li>East-west mammal corridors for white- tailed deer and raccoon connecting surrounding CUT, FOD, CUM and TPO areas.</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	•
W-CH21	Chappus Street Area	TPO	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal and snake corridors connecting CUW on north side to residences and FOD on south side</li> </ul>	<ul> <li>Lots of garter snakes in grassy areas</li> <li>Reports by local residents that fox snakes are common in area although none were observed by LGL field personnel</li> </ul>
W-CH22	Chappus Street Area	TPO	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>East-west mammal corridors along north side of TPO connecting FOD on east side to residence back yards on west side</li> </ul>	Lots of human influence
W-CH23	Chappus Street Area	TPO	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridors connecting surrounding CUW and FDO's</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>North-south creek drain on east side of TPO used by American toad, leopard frog and green frog for breeding</li> </ul>
W-CH24	Chappus Street Area	CUT	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	<ul> <li>No species of conservation concern were recorded</li> </ul>	<ul> <li>Mammal corridors north-south between creek drain on west side and CUT connecting CUW on north side to TPO and FOD on south side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>North-south creek drain on west side of CUT1 used by American toad, leopard frog and green frog for breeding</li> </ul>
W-CH25	Chappus Street Area	CUP	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridors north-south connect CUW on north side to FOD on south side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Human influence in this area
W-CH26	Chappus Street Area	CUT	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	<ul><li>Carolina Wren</li><li>Gray Catbird</li></ul>	<ul> <li>Mammal corridors north-south connect FOD to CUP</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	•
W-CH27	Chappus Street Area	CUP	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	<ul> <li>No species of conservation concern were recorded</li> </ul>	<ul> <li>Mammal corridors north-south connect CUP to residence back yards</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Human influence in this area
W-NSG1	North of Spring Garden Road	CUS	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>East-west corridors connecting FOD on east side with Malden Road on west side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Mammal movement north blocked by chain-linked fence along EC Row Expressway</li> </ul>

Reference Number	Location	Habitats (ELC's)		Significant Wildlife H	labitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-NSG2	North of Spring Garden Road	FOD	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>East-west mammal corridors connecting CUM on east side with CUS on west side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Mammal movement north blocked by chain-linked fence along EC Row Expressway</li> </ul>
W-NSG3	North of Spring Garden Road	CUM, TPO	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	Gray Catbird	<ul> <li>Mammal corridors throughout CUM connecting FOD and SWD areas</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Lots of white-tailed deer bedding areas at south end of CUM
W-NSG4	North of Spring Garden Road	SWD	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul> <li>Carolina Wren</li> <li>Cooper's Hawk</li> <li>Gray Catbird</li> </ul>	<ul> <li>Mammal corridors connecting CUM north to residence back yards south and FOD on east side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Cooper's Hawk possibly nesting in area</li> </ul>
W-NSG5	North of Spring Garden Road	FOD, CUW	<ul> <li>Land bird migratory stopover area</li> <li>Amphibian breeding ponds in forest</li> </ul>	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> <li>Vernal ponds in forest</li> </ul>	<ul><li>Carolina Wren</li><li>Gray Catbird</li></ul>	<ul> <li>Mammal corridors east-west through forest connecting CUT on east side to CUM on west side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Cooper's Hawk possibly nesting in area</li> <li>Vernal ponds in west end of forest with breeding chorus frogs</li> <li>North movements impeded by chain-linked fence along EC Row Expressway</li> <li>Lots of white-tailed deer trails going east-west through FOD at south end</li> </ul>
W-NSG6	North of Spring Garden Road	CUT	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Gray Catbird</li></ul>	<ul> <li>Mammal corridors east-west through CUT connecting FOD's on each side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	•
W-NSG7	North of Spring Garden Road	CUT	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul> <li>American Goldfinch</li> <li>Eastern Towhee</li> <li>Gray Catbird</li> </ul>	<ul> <li>Lots of white-tailed deer trails running east-west through CUT connecting FOD on west side to CUT on east side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>North movements impeded by chain-linked fence along EC Row Expressway</li> <li>Lots of breeding bird nests (old and new) found in CUT</li> </ul>
W-NSG8	North of Spring Garden Road	CUW	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	Gray Catbird	<ul> <li>East-west mammal corridors connecting CUW to resident backyards and CUT on east and south sides</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Huron Church Road is partial barrier to east side mammal movements</li> </ul>
W-NSG9	North of Spring Garden Road	CUW	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>No mammal corridors evident</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	CUW surrounded by major highways making it unsuitable for mammals and herpetofauna

Reference Number	Location	Habitats (ELC's)		Significant Wildlife H	łabitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-MAL1	Malden Park	МАМ	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridor east-west through MAM along fence row</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>South movements impeded by chain-linked fence along EC Row Expressway</li> </ul>
W-MAL2	Malden Park	CUM	No evidence	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	American Goldfinch	<ul> <li>Mammal corridors east-west along park roadway plus north-south connections from FOD on north side to MAM on south side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Large portion of this habitat is manicured</li> </ul>
W-MAL3	Malden Park	FOD	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	Gray Catbird	<ul> <li>Mammal corridors connecting FOD to surrounding habitats</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>FOD is elevated and primarily a hillside forest</li> </ul>
W-MAL4	Malden Park	CUS	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern and snakes</li> </ul>	<ul> <li>American Goldfinch</li> <li>Eastern Kingbird</li> <li>Orchard Oriole</li> <li>Rough-winged Swallow</li> </ul>	<ul> <li>Mammal corridors east-west along park roadways connecting FOD to CUM</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Brown Snakes migrating along east-west roadways in late September</li> </ul>
W-MAL5	Malden Park	FOD	<ul><li>Land bird migratory stopover area</li><li>Amphibian breeding ponds</li></ul>	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> <li>Vernal ponds for amphibians</li> </ul>	Gray Catbird	<ul> <li>Mammal corridors throughout woodlot connecting CUS1 on west side to CUS1 on east side of Malden Road</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul><li>Pond in center of FOD</li><li>Chorus frogs using pond as breeding area in spring</li></ul>
W-MAL6	East of Malden Road	TPO	No evidence	No areas that would contain wildlife uncommon     or rare	No species of conservation concern were recorded	Brown snake and garter snake corridors east-west through TPO	<ul> <li>Brown snakes and garter snake found under rock and boards</li> </ul>
W-MAL7	East of Malden Road	CUS	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	American Goldfinch	<ul> <li>Mammal corridors east-west connecting FOD on east side to FOD on west side across Malden Road</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>White-tailed deer beds found in center of CUS</li> </ul>
W-MAL8	East of Malden Road	CUM	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	American Goldfinch	<ul> <li>Mammal corridor connecting CUS to FOD on east-west sides</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	•
W-MAL9	East of Malden Road	MAM	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>No mammal corridor evidence</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Brown snake and garter snake found on north edge of MAM
W-MAL10	East of Malden Road	CUM	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	No corridor evidence	•

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			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corrid
W-MAL11	East of Malden Road	FOD	<ul> <li>Land bird migratory stopover area</li> </ul>	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridors connectin east side to CUM on west sid</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-MAL12	East of Malden Road	TPO	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	Mammal corridors at south e connecting FOD to CUW
W-MAL13	East of Malden Road	CUW	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>East-west mammal corridor connecting TPO to area alou row of EC Row Expressway</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-MAL14	East of Malden Road	CUW	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	No corridor movements evide
WABO1	NE Quadrant of EC Row and Huron Church	CUW	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	No corridor movements evide
W-LAM1	North of Lambton Street	TPO	No evidence	<ul> <li>Grasslands around creek are suitable habitat for fox snake and garter snake</li> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	<ul><li>Fox snake</li><li>Eastern Kingbird</li></ul>	<ul> <li>East-west snake and mamm corridors connecting creek o side to CUW on east side</li> <li>Mammal corridors connectin residence yards on north sid Spring Garden Park on south</li> </ul>
W-LAM2	North of Lambton Street	CUW	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	<ul> <li>Orchard Oriole</li> <li>Red-bellied Woodpecker</li> </ul>	<ul> <li>East-west snake and mamm corridors connecting creek o side to CUW on east side</li> <li>North-south snake and mam corridors connecting creek a side of CUW to Spring Garde south side</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-LAM3	North of Lambton Street	CUS	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal corridor on west sid CUS connecting CUW's on r south sides</li> </ul>
W-LAM4	North of Lambton Street	CUW	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	Gray Catbird	Small part of larger north-so migration corridor
W-LAM5	North of Lambton Street	FOD	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>East-west mammal corridors forest edges</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-LAM6	North of Lambton Street	CUM	No evidence	Habitat suitable for breeding birds of conservation concern	American Goldfinch	North-south mammal corrido from CUM to FOD north and south

	Comments
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ig TPO on de buth bird	•
end	•
ng fence outh bird	•
ent	Wildlife presence limited by highways completely surrounding the habitat.
ent	<ul> <li>Wildlife presence limited by highways completely surrounding the habitat.</li> </ul>
nal on west ig le with h side	<ul><li>Fox snake is a SARA species.</li><li>Bicycle trails along west and south sides of TPO</li></ul>
nal in west imal ilong north en Park on puth bird	•
de of north and	•
outh bird	Area enclosed by residences and businesses limiting the type of wildlife to human adapted species
s along outh bird	•
ors leading CUW	<ul><li>White-tailed deer beds in area</li><li>White-tailed deer feeding areas</li></ul>

Reference Number	Location	Habitats (ELC's)		Significant Wildlife H	labitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-LAM7	North of Lambton Street	CUW	<ul> <li>Land bird migratory stopover area</li> <li>Potential deer wintering yard</li> </ul>	Habitat suitable for breeding birds of conservation concern	<ul><li>Gray Catbird</li><li>Carolina Wren</li></ul>	<ul> <li>Numerous mammal corridors, especially of White-tailed deer, throughout woodlot</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Deer beds found inside woodlot
W-LAM8	North of Lambton Street	CUM	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	Mammal corridors from CUM to surrounding CUW	•
W-LAM9	North of Lambton Street	CUM	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	Mammal corridors across CUM and into surrounding CUW	•
W-NGM1	North of Grand Marais Road	CUW	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	No corridor movements evident	Area surrounded by heavy traffic
W-NGM2	North of Grand Marais Road	CUW	No evidence	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	<ul><li>American Goldfinch</li><li>Gray Catbird</li></ul>	<ul> <li>Mammal corridors throughout bush connecting to surrounding residences</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	Wildlife in area human influenced
W-TC1	Turkey Creek (Bridge and Creek Riparian)	Riparian	<ul> <li>Colonial bird breeding colony on Turkey Creek Bridge</li> </ul>	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> <li>Habitat suitable for fox snakes</li> </ul>	Fox Snake	No corridors observed	<ul> <li>Fox snakes observed along creek just west of Turkey Creek bridge</li> <li>Fox snake is a SARA species</li> <li>Cliff Swallow nesting colony on ceiling of bridge</li> <li>Barn Swallow nesting colony on ceiling of bridge</li> </ul>
W-RED1	North and South of Reddock Avenue	TPO	No evidence	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	Eastern Kingbird	<ul> <li>Mammal corridors running north-south through TPO connecting CUT and SWD on south side to SWD and another TPO on north side</li> <li>Snake corridors east-west and north- south through TPO</li> </ul>	<ul><li>White-tailed deer foraging zone</li><li>Garter snake foraging zone</li></ul>
W-RED2	North and South of Reddock Avenue	SWD, FOD, CUW	<ul> <li>Land bird migratory stopover area</li> <li>Potential winter deer yard</li> <li>Vernal ponds for breeding amphibians</li> </ul>	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> <li>Habitat suitable for fox snakes</li> <li>Vernal ponds</li> </ul>	<ul> <li>Fox Snake</li> <li>American Goldfinch</li> <li>Carolina Wren</li> <li>Gray Catbird</li> </ul>	<ul> <li>Mammal corridors connecting SWD to surrounding TPO, residences to FOD and FOD to CUM on east side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>White-tailed deer foraging zone</li> <li>White-tailed deer using SWD at north end of unit in TPO area (RED-1) for beds</li> <li>Chorus frog breeding ponds in woodlots</li> <li>Fox snake is a SARA species (reported in residence backyard and verified by local biologists)</li> </ul>
W-RED3	North and South of Reddock Avenue	CUT	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	Eastern Kingbird	<ul> <li>Mammal corridors connecting TPO to SWD</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	White-tailed deer bedding area
W-RED4	North and South of Reddock Avenue	CUM	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	Mammal corridors from CUM into     SWD	•

Reference Number	Location	Habitats (ELC's)		Significant Wildlife	Habitat	
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corrid
W-RED5	North and South of Reddock Avenue	CUW	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal corridors connectin residence backyards on nort CUT on south side</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-RED6	North and South of Reddock Avenue	CUT	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	Mammal corridors connectin north side to SWD on south s
W-RED7	North and South of Reddock Avenue	СИМ	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul> <li>American Goldfinch</li> <li>Eastern Kingbird</li> <li>Gray Catbird</li> <li>Orchard Oriole</li> </ul>	East-west mammal corridors     north section of FOD
W-RED8	North and South of Reddock Avenue	МАМ	<ul> <li>Land bird migratory stopover area</li> <li>Vernal pond in fragmite patch</li> </ul>	<ul> <li>No areas that would contain wildlife uncommon or rare</li> <li>Small pond in fragmite patch suitable for breeding amphibians</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridors connectin surrounding CUM</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-OAK1	Oakwood Bush	CUW, FOD	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul> <li>American Goldfinch</li> <li>Gray Catbird</li> </ul>	<ul> <li>Mammal corridors connectin woodlots to surrounding CU</li> <li>North-south mammal corrido connecting Cabana Road are south end to FOD at north e</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-OAK2	Oakwood Bush	СИМ	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal corridors connectin forest to surrounding CUM</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-HCL1	Between Huron Church Line and Huron Church Road	CUW	Land bird migratory stopover area	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	<ul> <li>Mammal corridors throughou connecting to FOD on south and surrounding residences</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-HCL2	Between Huron Church Line and Huron Church Road	FOD	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridors throughou connect to CUT on east side residences on north, west ar sides</li> <li>Small part of larger north-so migration corridor</li> </ul>
W-HCL3	Between Huron Church Line and Huron Church Road	CUT	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Gray Catbird</li></ul>	<ul> <li>Mammal corridors connectin south side to MAM on north SWD on east side</li> <li>Small part of larger north-so migration corridor</li> </ul>

	Comments
lors⁵	
ig th side to buth bird	•
ig CUW on side	•
s along	White-tailed deer foraging area
ig area to outh bird	<ul> <li>No evidence of movements to the east because of Huron Church Road</li> <li>Green frogs breeding in fragmite patch next to Huron Church Road</li> </ul>
ig inside of IM's or ea in end outh bird	Small creek drain east-west through center of CUW1
ig inside of outh bird	•
ut CUW east side outh bird	<ul> <li>Human adapted wildlife found in this area</li> </ul>
ut forest e and nd south outh bird	Cahill Drain flows along south side of forest
ig FOD on side and outh bird	<ul> <li>Cahill Drain flows along south side of CUW</li> <li>evidence mammals crossing from CUW to ESA on north side of Huron Church Road</li> </ul>

Reference Number	Location	Habitats (ELC's)		Significant Wildlife	Habitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-HCL4	Between Huron Church Line and Huron Church Road	MAM	Land bird migratory stopover area	<ul> <li>No areas that would contain wildlife uncommon or rare</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridors from MAM to CUT and SWD</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Evidence that mammals crossing from MAM to ESA on north side of Huron Church Road</li> </ul>
W-HCL5	Between Huron Church Line and Huron Church Road	SWD	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	Gray Catbird	Cahill Drain is a mammal corridor connecting W-ESA to W-HCL5	<ul> <li>Cahill Drain flows east-west through south side of SWD</li> <li>Track and trail evidence showed muskrat, raccoon, red fox, coyote and white-tailed deer using Cahill Drain as a corridor year-round</li> </ul>
W-HCL6	Between Huron Church Line and Huron Church Road	CUT	<ul> <li>Land bird migratory stopover area</li> </ul>	Habitat suitable for breeding birds of conservation concern	American Goldfinch	<ul> <li>Cahill Drain is a mammal corridor connecting W-ESA to W-HCL6</li> <li>Snake corridors throughout center of CUT</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Cahill Drain flows east-west along north side of CUT</li> <li>Track and trail evidence showed muskrat, raccoon, red fox, coyote and white-tailed deer using Cahill Drain as a corridor year-round</li> <li>Lots of eastern garter snakes foraging in grassy areas of CUT</li> </ul>
W-HCL7	Between Huron Church Line and Huron Church Road	СИМ	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	Savannah Sparrow	<ul> <li>East-west mammal corridors connecting CUT to MAS and CUM to residences on south side</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Entire CUM being cut in mid-June. Recommend not cutting until late July/early August when Savannah Sparrow young have fledged.</li> </ul>
W-HCL8	Between Huron Church Line and Huron Church Road	MAS	<ul> <li>Land bird migratory stopover area</li> <li>amphibian breeding pond</li> </ul>	<ul> <li>No areas that would contain wildlife uncommon or rare</li> <li>breeding pond/marsh habitat</li> </ul>	No species of conservation concern were recorded	<ul> <li>Mammal corridors connecting marsh to surrounding CUM</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>American toad and chorus frogs seasonal breeding area within 20 m of Talbot Road</li> </ul>
W-ESA1	St. Clair College	CUT	<ul> <li>Land bird migratory stopover area</li> </ul>	Habitat suitable for breeding birds of conservation concern	Gray Catbird	<ul> <li>Cahill Drain is a mammal corridor connecting W-ESA1 to W-HCL5 and W-HCL6</li> <li>Mammal corridors throughout CUT connecting it to St. Clair College and residences</li> </ul>	<ul> <li>Lots of human influence throughout CUT from St. Clair College (jogging trails, aerobics fitness center)</li> </ul>
W-HWY1	Highway 401	СИМ	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	American Goldfinch	<ul> <li>Mammal corridors connecting CUW east to residences west.</li> <li>Mammal corridors connecting CUM to agricultural areas south and east.</li> </ul>	<ul> <li>Foraging zone for migratory land birds during spring and fall migrations.</li> </ul>
W-HWY2	Highway 401	CUS	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Gray Catbird</li></ul>	<ul> <li>Mammal corridors connecting CUS to surrounding agricultural lands and CUM</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	White-tailed deer foraging and bedding area
W-HWY3	Highway 401	CUW	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul> <li>American Goldfinch</li> <li>Eastern Kingbird</li> <li>Gray Catbird</li> </ul>	Mammal corridors north-south through CUW rows giving protection and access to surrounding habitats	Tree rows next to open fields used for nesting
W-HWY4	Highway 401	OAO	Land bird migratory stopover area	No evidence	No species of conservation concern were recorded	Mammal corridors to and from pond continuous with surrounding tree rows	Green frog breeding pond

Reference Number	Location	Habitats (ELC's)		Significant Wildlife	Habitat		Comments
			Seasonal Concentration of Animals <sup>1</sup>	Rare Vegetation Communities <sup>2</sup> or Specialized Habitats to Wildlife <sup>3</sup>	Species of Conservation Concern <sup>4</sup>	Animal Movement Corridors <sup>5</sup>	
W-HWY5	Highway 401	CUT	Land bird migratory stopover area	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	Gray Catbird	<ul> <li>Mammal corridors along creek through woodlot and in ditches connecting both sides of Talbot Road and agricultural fields.</li> <li>Small part of larger north-south bird migration corridor</li> </ul>	<ul> <li>Thicket and creek combination is excellent habitat containing species such as Brown Thrasher, Song Sparrow, Northern Cardinal, Indigo Bunting</li> </ul>
W-HWY6	Highway 401	CUM1-1	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	American Goldfinch	Mammal corridors in creek drain along north side of cemetery	Human influenced wildlife present
W-AGR1	Outer Drive	Agricultural	Land bird migratory stopover area	Habitat suitable for breeding birds of conservation concern	<ul> <li>American Goldfinch</li> <li>Horned Lark</li> <li>Savannah Sparrow</li> </ul>	<ul> <li>Mammal corridors along field edges next to CUT and creek drains</li> </ul>	<ul> <li>Abandoned fields from previous season are excellent nesting areas for bird species such as Killdeer, Horned Lark and Vesper Sparrow.</li> <li>Feeding area for geese, doves, blackbirds, etc.</li> </ul>
W-AGR2	Outer Drive	Agricultural	No evidence	No areas that would contain wildlife uncommon or rare	no species of conservation concern were recorded	Mammal corridors along field edges next to CUT and creek drains	<ul> <li>Field edges next to drain were nesting areas for geese and ducks</li> </ul>
W-AGR3	Outer Drive	Agricultural	No evidence	No areas that would contain wildlife uncommon or rare	No species of conservation concern were recorded	Mammal corridors along field edges     next to CUT and creek drains	<ul> <li>Abandoned fields from previous season are excellent nesting areas for bird species</li> </ul>
W-AGR4	South Talbot Road east of Outer Drive	Agricultural	No evidence	Habitat suitable for breeding birds of conservation concern	<ul><li>Horned Lark</li><li>Vesper Sparrow</li></ul>	Mammal corridors along field edges connecting to CUT and creek within	<ul> <li>Abandoned fields from previous season are excellent nesting areas for bird species</li> </ul>
W-RES1	Montgomery Drive	Urban	No evidence	<ul> <li>Habitat suitable for breeding birds of conservation concern</li> </ul>	<ul><li>American Goldfinch</li><li>Carolina Wren</li></ul>	<ul> <li>Mammal movements in and around residences</li> </ul>	<ul> <li>Wildlife adapted to human presence (bird feeders, human structures for dwellings and surrounding woodlots as suitable nesting areas for migratory birds)</li> <li>Mammals, such as eastern cottontails, forage on residence lawns.</li> </ul>
W-RES2	Chelsea Drive	Urban	No evidence	Habitat suitable for breeding birds of conservation concern	<ul><li>American Goldfinch</li><li>Carolina Wren</li></ul>	<ul> <li>Mammal movements in and around residences</li> </ul>	<ul> <li>Wildlife adapted to human presence (bird feeders, human structures for dwellings and surrounding woodlots as suitable nesting areas for migratory birds)</li> <li>Mammals, such as eastern cottontails, forage on residence lawns.</li> </ul>

#### Notes:

<sup>1</sup> Seasonal concentration of animals includes: winter deer yards; moose late winter habitat; colonial bird nesting sites; waterfowl stopover and staging areas; shorebird migratory stopover areas; landbird migratory stopover areas; raptor winter feeding and roosting areas; wild turkey winter range; turkey vulture summer roosting areas; reptile hibernacula; bat hibernacula; bullfrog concentration areas; and, migratory butterfly stopover areas.

<sup>2</sup> Rare vegetation communities include: alvars; tall-grass prairies; savannahs; rare forest types; talus slopes; rock barrens; sand barrens; and, Great Lakes dunes.

<sup>3</sup> Specialized habitats for wildlife include: habitat for area-sensitive species; forests providing a high diversity of habitats; old-growth or mature forest stands; foraging areas with abundant mast; amphibian woodland breeding ponds; turtle nesting habitat; specialized raptor nesting habitat; special moose habitat (calving areas, aquatic feeding areas and mineral licks); and, mink, otter, marten or fisher denning sites; cliffs and caves; and, seeps and springs.

<sup>4</sup> Species of conservation concern include: globally rare; nationally rare; provincially rare; regionally rare; locally rare; and, species of concern to the planning authority.

<sup>5</sup> Animal movement corridors include dwelling habitat for plants and animals; and, conduits for daily and seasonal movements of animals, dispersal of organisms and genes and long-distance range shifts of species.



PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment									Natural Alterna	ative 1A Plaza A										
											Segments-Malden R	oad to North Talbot Rd										
				Malden Rd to Pulfor	ord	P	ulford north of Lennon	Drain	North c	of Lennon Drain to Cous	sineau Rd		Cousineau Rd to Howa	ard Ave		Howard Ave to Highwa	y 401	н	ighway 3 to North Talbo	ot Rd		
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			н-і			ĿJ			J-K			K-L			L-M			
			Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Total Area	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, Type/Area and significance	e Basin Drain	Stream Corridor	Low	Oakwood Bush to Sprin	g Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low		
	Landscapes		Voungetown Droin	Etroom Corridor	Low	Garden ANSI	Stream Carridar	Low	St. Cloir College Brairie	Botok	Madarata	Colling Droin	Stroom Corridor	Low	No Nome Tributony of	Stroom Corridor	Low					+
			Toungstown Drain	Stream Comuo	Low	Lennon Drain	Stream Comuo	LOW	Remnant	i aton	Woderate	Comina Drain	Stream Comuon	LOW	Wolfe Drain	Stream Comdon	Low					1
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low								
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low								
			North of Spring Garde	en Matrix	Low							Howard Avenue Drain	Stream Corridor	Low								1
			Road					-				Banaga Drain	Stream Carridar	Low								+
												Benson Drain	Stream Comuon	LOW								1
												Dickson Drain	Stream Corridor	Low								1
				-		+		+			+	No Name Tributary of	Stream Corridor	Low			-	+		+		t
												Dickson Drain										L
				Total High	0		Total High	0		Total High	0		Total High	0		Total High	0		Total High	0	(	Total High
				Total Low	4		Total Moderate	2		Total Low	2		Total Moderate	8		Total Moderate	2		Total Moderate	1	1	Total Low
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community Type/Area, area, significance an sensitivity	d Area Displaced	1.35	High	Area Displaced		High	Area Displaced	0.08	High	Area Displaced		High	Area Displaced		High	Area Displaced	0.00	High	1.43	Total High
			Area Displaced	6.29	Moderate	Area Displaced	0.30	Moderate	Area Displaced	0.66	Moderate	Area Displaced	0.00	Moderate	Area Displaced		Moderate	Area Displaced	0.00	Moderate	7.2	Total Moderate
			Area Displaced	10.11	Low	Area Displaced	2.51	Low	Area Displaced	3.06	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low	16.34	Total Low
	Impacts to Aquatic	Community Type/Area, area, significance an	d Basin Drain	0.11	Low	Basin Drain	2.81	Low	Basin Drain	3.81	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	25.0.	Total Area Displaced
	Communities/	sensitivity																				1
			Basin Drain	0.03	None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None		L
			Cahill Drain		Low	Cahill Drain		Low	Cahill Drain	0.02	Low	Cahill Drain		Low	Cahill Drain		Low	Cahill Drain		Low		+
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.03	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate		1
			Grand Marais Drain	0.09	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low		
			Lennon Drain	0.00	Moderate	Lennon Drain		Moderate	Lennon Drain	0.06	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate		+
			Wolfe Drain	0.03	low	Wolfe Drain		Low	Wolfe Drain	0.01	low	Wolfe Drain	0.54	Low	Wolfe Drain		low	Wolfe Drain		Low		1
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate		
			Youngstown Drain	0.08	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low		
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.39	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	0.3	Total Moderate
			Area Displaced	0.06	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	0.00	Total None
			Total Area Displaced	0	).34	Total Area Displaced	0.0	00	Total Area Displaced	0	41	Total Area Displaced	(	0.54	Total Area Displaced	0.	.00	Total Area Displaced	0.0	00	1.29	Total Area Displaced
Populations/Species	Impacts to Species at Risk	Species name, Type/Area and significance	Provincially Rare Specimens/Colonies		85 High	Provincially Rare Specimens/Colonies		6 High	Provincially Rare Specimens/Colonies	-	51 High	Provincially Rare Specimens/Colonies		0 High	Provincially Rare Specimens/Colonies		0 High	Provincially Rare Specimens/Colonies		0 High	14:	Total Provincially Rare Specimens/Colonies
Surface Water	Changes in surface wate conditions (quality and	area of surface drainage altered by each																				1
	quantity)	number of surface water drainages crossing	3	-				-			-		-									t
		by stream Type/Area																				
		number of encroachments on or severances surface water drainages	a																			1
		degree of compliance with Provincial and																				F
		Federal Water Quality Guidelines and	1																			1
0	Observation and the	Stormwater Management requirements																				+
Groundwater	conditions (quality and	area or inititration zones affected		_				-		-	-					-						+
	quantity)	areas of seepage affected	1	1		1	1	+		1	+		1					+	1			t
		area of water table affected by each alternati	ve				1	-			-								1			t
		(draw down zone)								1												L
		proximity of alternative to public and private drinking water wells																				
Other Natural Resources	Impacts to mineral,	Area in ha within ROW																				1
	(quarry) lands/easement	s																				1
Factor Summary:	1		1	-1		1	1	1	1	1	1	1	1	1	I	1	-1	1	1	1		<u>.</u>
Factor Score:	İ		1	1		1	1	1		1		1	1					1	1			

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment								I	Natural Alternative	e 1A Plaza B or C	;							
											Segments-Malden Roa	ad to North Talbot Rd								-
				G-H			ulford north of Lenne	on Drain	North c	of Lennon Drain to Cou	sineau Rd	Co	ousineau Rd to Howard	Ave		Howard Ave to Highwa	y 401		Highway 3 to North Tall	oot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			ŀJ			J-K			K-L			L-M	
			Name	Туре	Significance	Name	Туре	Significance	Name	Type	Significance	Name	Туре	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Sprin	g Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				Remnant St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolfe Drain					
			Marentette Drain	Stream Comdor	2010				Remnant to Spring Garde	n	Moderate	Durke Drain	Stream Contract	201						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garde	en Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						-
			Road						-			Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0	-	Total Moderate	0		Total Moderate	0
Communities/Ecosystems	Impacts to Terrestrial	Community type, area, significance and	Area Displaced	0.36	4 High	Area Displaced	0.00	High	Area Displaced	0.08	High	Area Displaced	0.00	o High	Area Displaced	0.00	2 High	Area Displaced	0.00	High
	Communities/ Ecosystems	sensitivity	Area Displaced	2.18	Moderate	Area Displaced	0.30	Moderate	Area Displaced	0.66	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
															·					
			Area Displaced Total Area Displaced	7.28 9.82	Low	Area Displaced Total Area Displaced	2.51	Low	Area Displaced Total Area Displaced	3.06	Low	Area Displaced Total Area Displaced	0.00	Low	Area Displaced Total Area Displaced	0.66	Low	Area Displaced Total Area Displaced	0.00	Low
	Impacts to Aquatic	Community type, area, significance and	Basin Drain	0.04	Low	Basin Drain	2.01	Low	Basin Drain	0.01	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low
			Cahill Drain		Low	Cahill Drain		Low	Cahill Drain	0.02	Low	Cahill Drain		Low	Cahill Drain		Low	Cahill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.03	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.09	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain Marentette Drain	0.03	Moderate None	Lennon Drain Marentette Drain		None	Lennon Drain Marentette Drain	0.06	Moderate None	Lennon Drain Marentette Drain		None	Lennon Drain Marentette Drain		None	Lennon Drain Marentette Drain		None
			Wolfe Drain	0.00	Low	Wolfe Drain		Low	Wolfe Drain	0.01	Low	Wolfe Drain	0.54	Low	Wolfe Drain		Low	Wolfe Drain		Low
			Wolfe Drain	0.04	Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Area Displaced	0.04	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.39	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.17	Low	Area Displaced	0.00	Low	Area Displaced	0.02	Low	Area Displaced	0.54	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Arra Disalarad			Area Disalarad			Assa Disala as d			Asso Displaced			Assa Disala and			Asso Displayed		
			Area Displaced	0.03	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
			Total Area Displaced	0.00	20	Total Area Displaced	0.00	0.00	Total Area Displaced	0.00	41	Total Area Displaced	0.00	54	Total Area Displaced	0.00	.00	Total Area Displaced	0.00	.00
Populations/Species	Impacts to Species at	Species name Type/Area and significance	Provincially Rare		45	Provincially Rare		6	Provincially Rare		51	Provincially Rare		0	Provincially Rare		0	Provincially Rare		0
ropulationoropooloo	Risk	opolios namo, Typer tida ana oignineaneo	Specimens/Colonies		10	Specimens/Colonies		5	Specimens/Colonies			Specimens/Colonies		0	Specimens/Colonies		°	Specimens/Colonies		5
Surface Water	Changes in surface wate	area of surface drainage altered by each																		
	quantity)	number of surface water drainages crossings	5																	-
		by stream type																		-
		surface water drainages																		
		degree of compliance with Provincial and Federal Water Quality Guidelines and Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected	1		1		1		1	1			1		1					1
	conditions (quality and quantity)	area of groupdwater recharge offected								-										-
	,)	area or groundwater recharge anected																		
		areas of seepage affected																		
		area of water table affected by each alternation	v																	
		(draw down zone)																		
		proximity of alternative to public and private																		
Other Natural Resources	Impacts to mineral,	Area in ha within ROW	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1
Factor Summary:										1					1					
1-High Impact 2-Medium Imp	act 3-Low Impact 4	Neutral/No Impact 5-I ow Benefit 6-Mer	dium Benefit 7-High	Benefit	1	1	1		L	1	1	1		1	1	1		1	1	
	0 2011 impuol 4																			

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment			Natural Alternative 1A Option 2 Plaza A Segments-Malden Road to North Talbot Rd o Pulford north of Lennon Drain to Cousineau Rd Cousineau Rd to Howard Ave Howard Ave to Highway 401 Highway															
											Segments-Malden R	oad to North Talbot Rd								
				Malden Rd to Pulfe	ord		Pulford north of Len	non Drain	North	of Lennon Drain to Co	busineau Rd		Cousineau Rd to Howard	i Ave	н	loward Ave to Highway	401	н	ighway 3 to North Tall	oot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			ŀJ			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Vaurantaura Dania	Otanam Canidaa	1	Garden ANSI	Otrana Carridae	1	Ot Olais Callege Desirie	Detab	Madaata	Callina Dasia	Otana an Canaida a	L mus	No Norse Tributeeu of	Character Consider	1			
			roungstown Drain	Stream Comdor	LOW	Lennon Drain	Stream Comdor	LOW	Remnant	Patch	woderate	Collins Drain	Stream Corndor	LOW	Wolfe Drain	Stream Corridor	LOW			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie Remnant to Spring Gard	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden	Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
			Road									Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
Communities/Ecosystems	Impacts to Terrestrial	Community type area significance and	Area Displaced	Total Low	4 High	Area Displaced	Total Low	2 High	Area Displaced	Total Low	2 High	Area Displaced	Total Low	8 High	Area Displaced	Total Low	2 High	Area Displaced	Total Low	1 High
	Communities/	sensitivity	riou Diopidood		, ngu	nica bisplacea	0.00	, ng.	nica Biopiacoa	0.10	- iigii	nica Displaced	0.00	. ng.	niou Displated	0.00		rioù Displated	0.00	
	Loosydonio		Area Displaced	6.29	Moderate	Area Displaced	0.30	Moderate	Area Displaced	1.20	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	10.21	Low	Area Displaced	2.51	Low	Area Displaced	3.94	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic	Community type, area, significance and	Basin Drain	0.11	Low	Basin Drain	2.01	Low	Basin Drain	5.20	Low	Basin Drain	0.04	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low
	Communities/	sensitivity																		
			Basin Drain Cabill Drain	0.03	None	Basin Drain		None	Basin Drain Cabill Drain	0.01	None	Basin Drain		None	Basin Drain Cabill Drain		None	Basin Drain		None
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.04	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.09	Low	Grand Marais Drain		Low	Grand Marais Drain	0.00	Low	Grand Marais Drain	0.09	Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain Marentette Drain	0.03	None	Marentette Drain		None	Lennon Drain Marentette Drain	0.06	None	Marentette Drain	0.03	None	Marentette Drain		None	Marentette Drain		None
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.21	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.08	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.31	Low	Youngstown Drain	0.04	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low
			Area Displaced	0.28	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.17	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.06	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.03	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Populations/Species	Impacts to Species at	Species name, type and significance	Total Area Displaced Provincially Rare	0.34	7.00	Provincially Rare	0.00	6.00	Total Area Displaced Provincially Rare	0.31	1.00	I otal Area Displaced Provincially Rare	0.20	10	Total Area Displaced Provincially Rare	0.00	10	Total Area Displaced Provincially Rare	0.00	00
	Risk		Specimens/Colonies	-		Specimens/Colonies			Specimens/Colonies	-		Specimens/Colonies			Specimens/Colonies			Specimens/Colonies	-	
Surface Water	Changes in surface wate conditions (quality and	area of surface drainage altered by each alternative																		
	quantity)	number of surface water drainages crossings																		
		number of encroachments on or severances of																		
		degree of compliance with Provincial and																		
		Federal Water Quality Guidelines and Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected																		
	conditions (quality and	area of groundwater recharge affected																		
	quantity)	areas of seepage affected																		
		draw down zone)																		
		proximity of alternative to public and private drinking water wells																		
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easement	Area in ha within ROW		1									1							
	,,														1					
Factor Summary:								·												
															1	1	1			

Factor Score: 1-High Impact 2-Medium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	Protect the Natural Environment								Natu	ral Alternative 1	A Option 2 Plaza B	3 or C							
										S	egments-Malden R	oad to North Talbot R	۲d							
				Malden Rd to Pul	ford		Pulford north of Lennon	Drain	North	of Lennon Drain to Cous	ineau Rd	c	Cousineau Rd to How	vard Ave		Howard Ave to Highw	vay 401		dighway 3 to North Talbo	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-1			ы			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolle Dialit					
			Grand Marais Drain	Stream Corridor	Moderate				Remnant to Spring Garde	n Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low						
			Grand Marais Drain	offean condo	woderate				Canin Drain	Stream Comdon	LOW	Burke Draine	Stream Contabi	Eow						
			North of Spring Garden Road	n Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
												Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of Dickson Drain	Stream Corridor	Low						
				Total High Total Moderate	1		Total High Total Moderate	0		Total High Total Moderate	2		Total High Total Moderate	0		Total High Total Moderate	0		Total High Total Moderate	0
		-		Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	0.37	High	Area Displaced	0.00	High	Area Displaced	0.13	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	2.18	Moderate	Area Displaced	0.30	Moderate	Area Displaced	1.20	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Total Area Displaced	9.85	LOW	Total Area Displaced	2.51	LOW	Total Area Displaced	5.26	LOW	Total Area Displaced	0.00	LOW	Total Area Displaced	0.66	LOW	Total Area Displaced	0.00	LOW
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.04	Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.01	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.09	Low	Grand Marais Drain		Low	Grand Marais Drain	0.04	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain	-	Low
			Lennon Drain	0.02	Moderate	Lennon Drain		Moderate	Lennon Drain	0.06	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Wolfe Drain	0.03	Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.21	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.04	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced Area Displaced	0.00	Moderate Low	Area Displaced Area Displaced	0.00	Moderate Low	Area Displaced Area Displaced	0.31	Moderate Low	Area Displaced Area Displaced	0.00	Moderate Low	Area Displaced Area Displaced	0.00	Moderate	Area Displaced Area Displaced	0.00	Moderate Low
			Area Displaced	0.03	None	Area Displaced	0.00	None	Area Displaced		None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Populations/Species	Impacts to Species at	Species name, type and significance	Total Area Displaced Provincially Rare		0.20	Total Area Displaced Provincially Rare	0.0	6	Total Area Displaced Provincially Rare	0.3	1	Total Area Displaced Provincially Rare		0.00	Total Area Displaced Provincially Rare		0.00	Total Area Displaced Provincially Rare	0.0	0
Surface Water	Risk Changes in surface wate	epocies name, type and significance	Specimens/Colonies			Specimens/Colonies			Specimens/Colonies			Specimens/Colonies			Specimens/Colonies		5	Specimens/Colonies		
Surface Water	conditions (quality and	alternative					_													
	quantity)	humber of surface water drainages crossings by stream type																		
		number of encroachments on or severances of surface water drainages	3																	
		degree of compliance with Provincial and Federal Water Quality Guidelines and																		
	01	Stormwater Management requirements																		
Groundwater	conditions (quality and	area of inflitration zones affected area of groundwater recharge affected		+			-	-			-				-					
	quantity)	areas of seepage affected																	-	
		area of water table affected by each alternativ (draw down zone)	·																	
		proximity of alternative to public and private drinking water wells				1						1							1	
Other Natural Resources	Impacts to mineral,	Area in ha within ROW																	+	
	petroleum, granular (quarry) lands/easement	ts																		
Factor Summary:			I					1							1					
Factor Score:																			T	

Factor score: 1-High Impact 2-Medium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment									Natural Alterna	ative 1B Plaza A								
											Segments-Malden R	oad to North Talbot Rd								
				Malden Rd to Pulfo	ord		Pulford north of Lenn	on Drain	North c	of Lennon Drain to Co	usineau Rd	c	Cousineau Rd to Howar	d Ave	н	loward Ave to Highwa	/ 401	н	ighway 3 to North Tall	pot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			Ы			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				Remnant St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolfe Drain					
			Grand Marais Drain	Stream Corridor	Moderate				Remnant to Spring Garde Cahill Drain	n Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low						
			North of Spring Garden	Matrix	L OW						-	Burke Draine Howard Avenue Drain	Stream Corridor	Low						
			Road	Wautx	Low							Ronoon Droin	Stream Corridor	Low	-					
														Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of Dickson Drain	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0		Total High	0		Total High	0		Total High	0
				I otal Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		I otal Moderate	0
Communities/Ecosystems	Imposto to Torrostrial	Community type, area, significance and	Area Displaced	1 40	4 Lliab	Area Displaced	10tal Low	Z	Area Diaplaced	TOTAL LOW	2 High	Area Displaced	1 Otal LOW	0 High	Area Displaced	1 Otal LOW	Z	Area Displaced	TOTAL FOW	l
Communities/Ecosystems	Communities/ Ecosystems	sensitivity	Area Displaced	0.00	mign Medaaata	Area Displaced	0.00	Madaata	Area Displaced	0.06	Madaaata	Area Displaced	0.00	nign Mederete	Area Displaced	0.00	High	Area Displaced	0.00	Madaata
			Area Displaced	10.65	Low	Area Displaced	2.01	Low	Area Displaced	2.82	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Total Area Displaced	18.34	LOW	Total Area Displaced	3.24	LOW	Total Area Displaced	3.54	LOW	Total Area Displaced	0.00	LOW	Total Area Displaced	0.66	LOW	Total Area Displaced	0.00	LOW
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.11	Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low
			Basin Drain	0.03	None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None
			Cahill Drain		None	Cahill Drain		None	Cahill Drain	0.01	None	Cahill Drain		None	Cahill Drain		None	Cahill Drain		None
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.01	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.03	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.09	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain		Moderate	Lennon Drain	0.02	Moderate	Lennon Drain	0.06	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Marentette Drain Wolfe Drain	0.04	None	Wolfe Drain		None	Warentette Drain	0.01	None	Marentette Drain	0.54	None	Wolfe Drain		None	Wolfe Drain		None
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain	0.04	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.08	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.02	Moderate	Area Displaced	0.39	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.28	Low	Area Displaced	0.00	Low	Area Displaced	0.01	Low	Area Displaced	0.54	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.07	None	Area Displaced	0.00	None	Area Displaced	0.01	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Bonulations/Engains	Imposto to Spesico et	Species name, type and significance	Total Area Displaced	(	0.35	Provincially Rara		16	Provincially Rara		E1	Provincially Rara	0.	0	Provincially Rara	0.	0	Provincially Rara	U	.00
	Risk	opecies name, type and significance	Specimens/Colonies		65	Specimens/Colonies		10	Specimens/Colonies		51	Specimens/Colonies		0	Specimens/Colonies		0	Specimens/Colonies		0
Surface water	conditions (quality and	alternative																		
	quantity)	number of surface water drainages crossings by stream type																		
		number of encroachments on or severances of surface water drainages																		
		degree of compliance with Provincial and																		
		Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected																		
	conditions (quality and	area of groundwater recharge affected																		
	quanuty)	areas of seepage affected																		
		area of water table affected by each alternativ (draw down zone)																		
		proximity of alternative to public and private drinking water wells																		
Other Natural Resources	Impacts to mineral	Area in ha within ROW		1		1	+		1	1							1	i i	1	+
	petroleum, granular (quarry) lands/easement:	s																		
Easter Summary			1	1		1	1		1	1	I		1		1	1	1	1	1	
Factor Summary:			r										T		T	r			r	

Factor Score: 1-High Impact 2-Medium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment									Natural Alternat	ive 1B Plaza B or C	;							
											Segments-Malden	Road to North Talbot Rd								
				Malden Rd to Pul	ford		Pulford north of Lenn	on Drain	North	of Lennon Drain to Cou	sineau Rd	с	ousineau Rd to Ho	ward Ave		Howard Ave to High	way 401		lighway 3 to North Tal	bot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-1			ĿJ			Ј-К			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Туре	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spi	ring Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie Remoant	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of Wolfe Drain	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie Remnant to Spring Gard	Strip Corridor en	Moderate	Burke Drain	Stream Corridor	Low						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			Road	Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
		-		Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	0.37	High	Area Displaced	0.00	High	Area Displaced	0.06	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	2.18	Moderate	Area Displaced	0.33	Moderate	Area Displaced	0.66	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced Total Area Displaced	9.85	Low	Total Area Displaced	3.24	LOW	Total Area Displaced	3.54	LOW	Total Area Displaced	0.00	Low	Total Area Displaced	0.66	LOW	Total Area Displaced	0.00	LOW
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.04	Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low
			Cahill Drain		Low	Cahill Drain		Low	Cahill Drain	0.01	Low	Cahill Drain		Low	Cahill Drain		Low	Cahill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.03	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.09	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain Moroptotto Drain	0.02	Moderate	Lennon Drain	0.02	Moderate	Lennon Drain Marantetta Drain	0.06	Moderate	Lennon Drain Morentette Drain		Moderate	Lennon Drain Marcatetta Drain		Moderate	Lennon Drain Marcatetta Drain		Moderate
			Wolfe Drain	0.03	Low	Wolfe Drain		Low	Wolfe Drain	0.01	Low	Wolfe Drain	0.54	Low	Wolfe Drain		Low	Wolfe Drain		Low
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.04	Low	Youngstown Drain	0.02	Low	Youngstown Drain	0.20	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low
			Area Displaced	0.17	Low	Area Displaced	0.00	Low	Area Displaced	0.02	Low	Area Displaced	0.54	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.03	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Populations/Species	Impacts to Species at	Species name, type and significance	Total Area Displaced Provincially Rare		0.20	Provincially Rare		0.02	I otal Area Displaced Provincially Rare	0.	41 51	I otal Area Displaced Provincially Rare		0.54	Frovincially Rare		0.00	Total Area Displaced Provincially Rare	(	.00
Surface Water	Risk Changes in surface wate	area of surface drainage altered by each	Specimens/Colonies			Specimens/Colonies			Specimens/Colonies			Specimens/Colonies			Specimens/Colonies			Specimens/Colonies		
	conditions (quality and	alternative																		
	quantity)	number of surface water drainages crossings by stream type																		
		number of encroachments on or severances of surface water drainages																		
		degree of compliance with Provincial and Federal Water Quality Guidelines and																		
Groundwater	Change in groundwater	area of infiltration zones affected											1							-
	conditions (quality and	area of groundwater recharge affected																		-
	quantity)	areas of seepage affected							1	1	1					1			1	1
		area of water table affected by each alternativ (draw down zone)																		
		proximity of alternative to public and private drinking water wells																		
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easement	Area in ha within ROW																		
Factor Summary:																				
Eactor Score:						1														

Factor Score: 1 1-High Impact 2-Medium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect the Natural Environment									I	Natural Alternative	1B Option 2 Plaz	a A							
											Segments-Malden R	oad to North Talbot Rd								
			Malden Rd to Pulford G-H			Pulford north of Lenn	on Drain	North	of Lennon Drain to Co	usineau Rd		Cousineau Rd to Howar	d Ave	Howard Ave to Highway 401				Highway 3 to North Talbot Rd		
Performance Measure	Criteria/Indicator	Measurement/Units			H-1			ы			J-К			K-L			L-M			
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spri	ng Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Managtatta Dania	Otanam Canidaa	1			-	Remnant	Otria Cassidas	Madausta	Pueles Desis	Oterana Consider	1	Wolfe Drain					
			Marentette Drain	Stream Comdor	LOW				Remnant to Spring Gard	en	Moderate	Burke Drain	Stream Corndor	LOW						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden	Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
			Koad									Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Comuon	LOW						
												No Name Tributary of Dickson Drain	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0		Total High	0		Total High	0		Total High	0
				Total Moderate	4		Total Moderate	2		Total Low	2	-	Total Moderate	8		Total Low	2		Total Moderate	0
Communities/Ecosystems	Impacts to Terrestrial	Community type, area, significance and	Area Displaced	1.40	High	Area Displaced	0.00	High	Area Displaced	0.06	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
	Communities/ Ecosystems	sensitivity																		
			Area Displaced	6.29	Moderate	Area Displaced	0.33	Moderate	Area Displaced	0.66	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	10.65	Low	Area Displaced	2.91	Low	Area Displaced	2.82	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic	Community type, area, significance and	Basin Drain	0.11	Low	Basin Drain	0.21	Low	Basin Drain	0.04	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low
	Communities/	sensitivity		0.00																
			Basin Drain Cahill Drain	0.03	Low	Basin Drain Cahill Drain		Low	Basin Drain Cahill Drain	0.01	Low	Basin Drain Cahill Drain		Low	Basin Drain Cahill Drain		Low	Cahill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.01	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain Grand Marais Drain	0.09	Moderate	Cahill Drain Grand Marais Drain		Moderate	Cahill Drain Grand Marais Drain	0.03	Moderate	Cahill Drain Grand Marais Drain		Moderate	Cahill Drain Grand Marais Drain		Moderate	Cahill Drain Grand Marais Drain		Moderate
			Lennon Drain	0.03	Moderate	Lennon Drain	0.02	Moderate	Lennon Drain	0.06	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Marentette Drain	0.04	None	Marentette Drain		None	Marentette Drain		None	Marentette Drain	0.54	None	Marentette Drain		None	Marentette Drain		None
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.01	Low Moderate	Wolfe Drain	0.54	Low Moderate	Wolfe Drain		Low Moderate	Wolfe Drain		Low Moderate
			Youngstown Drain	0.08	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.02	Moderate	Area Displaced	0.39	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.07	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Demulations/Canadian	lana anto ta Calania at	Consist and the set similar	Total Area Displaced	(	0.35	Total Area Displaced		0.02	Total Area Displaced		0.41	Total Area Displaced	0.	54	Total Area Displaced	0.	00	Total Area Displaced	0.	00
Populations/opecies	Risk	Species name, type and significance	Specimens/Colonies		65	Specimens/Colonies		10	Specimens/Colonies		51	Specimens/Colonies		0	Specimens/Colonies		0	Specimens/Colonies		0
Surface Water	Changes in surface wate	area of surface drainage altered by each									İ									
	quantity)	number of surface water drainages crossings												-	-					
		by stream type																		
		number of encroachments on or severances or surface water drainages																		
		degree of compliance with Provincial and																		
		Federal Water Quality Guidelines and Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected																		
C. C. I.	conditions (quality and	area of groundwater recharge affected																		
	quantity)	areas of seepage affected		-																
		draw down zone)	1																	
		proximity of alternative to public and private																		
Other Natural Resources	Impacts to mineral	drinking water wells		+		+	-			+		-	+	+	+		+	+		-
outer Matural Resources	petroleum, granular (quarry) lands/easement	s																		
Eactor Summary:				1					1	1			1	1	1		1		1	
Factor Summary:				T	-	T	-		1	-	-	-	T	-	T	1	-		-	T

Factor Score: 1-High Impact 2-Medium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect the Natural Environment									Natu	ral Alternative 1	B Option 2 Plaza B	s or C							
	•									S	egments-Malden R	oad to North Talbot R	ld							
				Malden Rd to Pulford			Pulford north of Lennon	Drain	North of Lennon Drain to Cousineau Rd			Cousineau Rd to Howard Ave				Howard Ave to Highw	ay 401	Highway 3 to North Talbot Rd		
Performance Measure	Criteria/Indicator	Measurement/Units	G-H		H-I			ы			J-K			K-L			L-M			
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolle Dialit					
			0 IN . D .	0					Remnant to Spring Garde	n i i i i i i i i i i i i i i i i i i i		N.N. 73.4	0					-		
			Grand Marais Drain	Stream Corridor	Moderate				Canili Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden Road	n Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
												Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low					-	
												No Name Tributary of Dickson Drain	Stream Corridor	Low						
				Total High Total Moderate	0		Total High Total Moderate	0		Total High Total Moderate	0		Total High Total Moderate	0		Total High Total Moderate	0		Total High Total Moderate	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/	Community type, area, significance and sensitivity	Area Displaced	0.41	High	Area Displaced	0.00	High	Area Displaced	0.13	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
	Ecosystems		Area Displaced	2.29	Moderate	Area Displaced	0.33	Moderate	Area Displaced	1.20	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	7.42	Low	Area Displaced	2.91	Low	Area Displaced	3.94	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.04	Low	Basin Drain	5.24	Low	Basin Drain	5.20	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.01	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain Grand Marais Drain	0.09	Moderate Low	Cahill Drain Grand Marais Drain		Moderate Low	Cahill Drain Grand Marais Drain	0.04	Moderate Low	Cahill Drain Grand Marais Drain	-	Moderate Low	Cahill Drain Grand Marais Drain		Moderate Low	Cahill Drain Grand Marais Drain		Moderate Low
			Lennon Drain		Moderate	Lennon Drain	0.02	Moderate	Lennon Drain	0.06	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Marentette Drain Wolfe Drain	0.03	None Moderate	Marentette Drain Wolfe Drain		None	Marentette Drain Wolfe Drain	0.16	None Moderate	Marentette Drain Wolfe Drain		None Moderate	Marentette Drain Wolfe Drain		None Moderate	Marentette Drain Wolfe Drain		None Moderate
			Youngstown Drain	0.04	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.02	Moderate	Area Displaced	0.27	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.03	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Populations/Encoires	Impacts to Species at	Proving name, type and significance	Total Area Displaced	_	0.21	Total Area Displaced	0.0	2	Total Area Displaced	0.2	7	Total Area Displaced		0.00	Total Area Displaced		0.00	Total Area Displaced	0.0	0
	Risk	Species name, type and significance	Specimens/Colonies		40	Specimens/Colonies		6	Specimens/Colonies	4	1	Specimens/Colonies		0	Specimens/Colonies		0	Specimens/Colonies		0
Surface water	conditions (quality and	alternative																		
	quantity)	humber of surface water drainages crossings by stream type																		
		number of encroachments on or severances of surface water drainages	0																	
		degree of compliance with Provincial and Federal Water Quality Guidelines and																		
	01	Stormwater Management requirements																		
Groundwater	conditions (quality and	area of groundwater recharge affected																		
	quantity)	areas of seepage affected	ł	1		1		1	1	1	1		1		1			1	1	
		area of water table affected by each alternativ (draw down zone)	/																	
		proximity of alternative to public and private drinking water wells																	1	
Other Natural Resources	Impacts to mineral,	Area in ha within ROW	1			1	1	1	1	1	1		1		1	1	1	1	+	1
	petroleum, granular (quarry) lands/easement	ts																		
Factor Summary:			I	1		1		1	1	1	1		1		<u> </u>	<u> </u>		1		<u> </u>
Factor Score:											1		1					1	T	

Factor score: 1-High Impact 2-Medium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect the Natural Environment										Natural Alterna	ative 2A Plaza A								
											Segments-Malden Ro	ad to North Talbot Rd								
Performance Measure			Malden Rd to Pulford G-H			P	ulford north of Lennon I	Drain	North of Lennon Drain to Cousineau Rd				Cousineau Rd to Howa	ırd Ave		Howard Ave to Highv	vay 401	Highway 3 to North Talbot Rd		
	Criteria/Indicator	Measurement/Units				H-I			LJ			J-K			K-L			L-M		
			Nama	Tupo	Significance	Namo	Tuno	Significance	Nama	Tuno	Significance	Name	Type	Significance	Namo	Turne	Significance	Nama	Tuno	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and	Basin Drain	Stream Corridor	low	Oakwood Bush to Spring	Strip Corridor	low	Lennon Drain	Stream Corridor	low	Wolfe Drain	Stream Corridor	low	Wolfe Drain	Stream Corridor	low	Wolfe Drain	Stream Corridor	Significance
	Landscapes	significance	Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie Remnant to Spring Garder	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolle Drain					
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden Road	Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
												Benson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	1.61	High	Area Displaced	0.25	High	Area Displaced	0.36	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	6.31	Moderate	Area Displaced	0.29	Moderate	Area Displaced	1.04	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Total Area Displaced	18.93	LOW	Total Area Displaced	4.23	LOW	Total Area Displaced	3.86	LOW	Total Area Displaced	0.00	LOW	Total Area Displaced	0.66	LOW	Total Area Displaced	0.00	LUW
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.11	Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low
			Basin Drain	0.03	None	Basin Drain		None	Basin Drain Cabill Drain	0.02	None	Basin Drain		None	Basin Drain		None	Basin Drain		None
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.02	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.04	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.06	Low	Grand Marais Drain		Low	Grand Marais Drain	0.05	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain Marentette Drain	0.02	None	Lennon Drain Marentette Drain		None	Lennon Drain Marentette Drain	0.05	None	Lennon Drain Marentette Drain		None	Lennon Drain Marentette Drain		None	Lennon Drain Marentette Drain		Noderate
			Wolfe Drain	0.02	Low	Wolfe Drain		Low	Wolfe Drain	0.01	Low	Wolfe Drain	0.58	Low	Wolfe Drain		Low	Wolfe Drain		Low
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.09	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low
			Area Displaced	0.26	Low	Area Displaced	0.00	Low	Area Displaced	0.02	Low	Area Displaced	0.58	Low	Area Displaced	0.00	low	Area Displaced	0.00	low
			Area Displaced	0.05	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
			Total Area Displaced	0.	31	Total Area Displaced	0.0	00	Total Area Displaced	0	.40	Total Area Displaced	C	0.58	Total Area Displaced		0.00	Total Area Displaced		0.00
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare		94	Provincially Rare	3	55	Provincially Rare		33	Provincially Rare	-	U	Provincially Rare	-	U	Provincially Rare	-	U
Surrace water	conditions (quality and quantity)	each alternative number of surface water drainages																		
		crossings by stream type number of encroachments on or severances of surface water																		
		degree of compliance with Provincia and Federal Water Quality	t																	
Groundwater	Change in groundwater	area of infiltration zones affected	1	1		1	1	1	1	1		1		-		-		-	+	
	conditions (quality and	area of groundwater recharge																		
	quantity)	areas of seepage affected																		
		area of water table affected by each				1		1	1	1									1	1
		alternative (draw down zone) proximity of alternative to public and private drinking water wells																		
Other Natural Resources	Impacts to mineral	Area in ha within ROW			-			+							-	+				
Curier Matural Resources	petroleum, granular (quarry) lands/easements																			
Factor Summary:		I	1		1	1	I		1	1		1	1					1		
Factor Score:	1																			

1-High Impact 2-Medium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit
PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment									Natural Alternat	ive 2A Plaza B or (	C							
											Segments-Malden	Road to North Talbot Rd								
				Malden Rd to Pul	lford		Pulford north of Lennon	Drain	North c	of Lennon Drain to Cou	sineau Rd	c	Cousineau Rd to Hov	vard Ave		Howard Ave to Highw	ray 401		lighway 3 to North Talb	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			ŀJ			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie Remnant	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of Wolfe Drain	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie Remnant to Spring Garde	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden Road	n Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
			-									Benson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
Communities/Ecosystems	Impacts to Terrestrial Communities/	Community type, area, significance and sensitivity	Area Displaced	0.58	4 High	Area Displaced	0.25	2 High	Area Displaced	0.36	2 High	Area Displaced	0.00	8 High	Area Displaced	0.00	2 High	Area Displaced	0.00	1 High
	Ecosystems		Area Displaced	2.31	Moderate	Area Displaced	0.29	Moderate	Area Displaced	1.04	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	7.57	Low	Area Displaced	4.23	Low	Area Displaced	2.46	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Imposto to Aquatia	Community type, area, significance and	Total Area Displaced	10.46	l our	Total Area Displaced	4.77	Low	Total Area Displaced	3.86	Low	Total Area Displaced	0.00	Low	Total Area Displaced	0.66	Low	Total Area Displaced	0.00	Low
	Communities/	sensitivity	Cabill Drain	0.04	Low	Cabill Drain		Low	Cabill Drain	0.02	Low	Cabill Drain		Low	Cabill Drain		Low	Cabill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.00	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.04	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.06	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain	0.00	Moderate	Lennon Drain		Moderate	Lennon Drain	0.05	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Wolfe Drain	0.02	1 ow	Wolfe Drain		Low	Wolfe Drain	0.01	Low	Wolfe Drain	0.58	I ow	Wolfe Drain		Low	Wolfe Drain		Low
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain	0.50	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.38	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.11	Low	Area Displaced	0.00	Low	Area Displaced	0.02	Low	Area Displaced	0.58	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Total Area Displaced	0.02	0.13	Total Area Displaced	0.00	00	Total Area Displaced	0.00	40	Total Area Displaced	0.00	0.58	Total Area Displaced	0.00	0.00	Total Area Displaced	0.00	0
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare		54	Provincially Rare		35	Provincially Rare		33	Provincially Rare		0	Provincially Rare		0	Provincially Rare	-	0
Surface Water	Changes in surface wate conditions (quality and	area of surface drainage altered by each alternative																		
	quantity)	number of surface water drainages crossings by stream type																		
		number of encroachments on or severances of surface water drainages	0																	
		degree of compliance with Provincial and Federal Water Quality Guidelines and																		
Groundwater	Change in groundwater	Stormwater Management requirements																		
Groundwater	conditions (quality and	area of groundwater recharge affected		1		1	+				1	-	1			+	-		+	
	quantity)	areas of seepage affected					-									-			+	
		area of water table affected by each alternativ (draw down zone)	/										1						1	
		proximity of alternative to public and private drinking water wells											1						1	
Other Natural Resources	Impacts to mineral,	Area in ha within ROW	1			1							1			1			+	
	petroleum, granular (quarry) lands/easement	is a second second second second second second second second second second second second second second second s																		
Faster Cummeru								1							1			1		
Factor Summary:			1			1		1	1	1	-	-	1	-		-	-	1		1
1 40101 30018.	1		1	1	1		1		1	1		1	1			1		1		

PRACTICAL ALTERNATIVE EVALUATION	Factor: F	Protect the Natural Environment								N	atural Alternative	2A Option 2 Plaz	a A							
											Segments-Malden Ro	oad to North Talbot Rd							·	
				Malden Rd to Pulfor	rd		Pulford north of Lennon	Drain	North c	of Lennon Drain to Cou	sineau Rd	c	Cousineau Rd to How	ard Ave		Howard Ave to Highw	vay 401		Highway 3 to North Talb	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-1			ĿJ			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes				-	Garden ANSI	3 - 1				-			-			-			
			Youngstown Drain	Stream Corridor	Low	Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Morontotto Droin	Stroom Corridor	Low	-			Remnant St. Clair collogo Brairia	Strip Corridor	Modorato	Rurko Droin	Stroom Corridor	l ou	Wolfe Drain			-		
			Marentette Drain	Stream Comuon	LOW				Remnant to Spring Garde	n	wouerate	Burke Drain	Stream Comuoi	LOW						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garder	n Matrix	Low							Howard Avenue Drain	Stream Corridor	Low					-	
			Road										A							
												Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
														-						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	1.61	High	Area Displaced	0.25	High	Area Displaced	0.36	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
	Loodyotomo		Area Displaced	6.31	Moderate	Area Displaced	0.29	Moderate	Area Displaced	1.19	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	10.78	Low	Area Displaced	4.23	Low	Area Displaced	3.00	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
			Total Area Displaced	18.70		Total Area Displaced	4.77		Total Area Displaced	4.55		Total Area Displaced	0.00	-	Total Area Displaced	0.66		Total Area Displaced	0.00	-
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.11	Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low
			Basin Drain	0.03	None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.04	Moderate	Cahill Drain			7 Cahill Drain		Moderate	Cahill Drain	-	Moderate
			Grand Marais Drain	0.06	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain	0.05	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Voungstown Drain	0.02	None	Voungstown Drain		None	Marentette Drain		None	Marentette Drain		None	Marentette Drain		None	Voungstown Drain		None
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.08	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.26	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.05	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Denulations (Canadian	Inconstanta Consistant	Consist some tage and similiares	Total Area Displaced	0.	31	Total Area Displaced	0.0	00	Total Area Displaced	0.0	08	Total Area Displaced		0.00	Total Area Displaced		0.00	Total Area Displaced	0.0	00
Populations/Species	impacts to Species at	Species name, type and significance	Provincially Rare		94	Provincially Rare	2	5	Provincially Rare		26	Provincially Rare		0	Provincially Rare		0	Provincially Kare		0
Surrace water	conditions (quality and	alternative							1	1			1							1
	quantity)	number of surface water drainages crossings																		
		by stream type				1			1				1					1		1
		number of encroachments on or severances	a																	
		surface water drainages																		
		degree of compliance with Provincial and																		
		Federal Water Quality Guidelines and Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected																		
	conditions (quality and	area of groundwater recharge affected																		
	quantity)	areas of seepage affected							-											
		area of water table affected by each alternation	v	-	1	1	1	1	1	1	1	1	1					1	+	1
		(draw down zone)				1			1				1					1		1
		proximity of alternative to public and private							1											
		drinking water wells				1			1				1					1		1
Other Natural Resources	Impacts to mineral,	Area in ha within ROW																		
	petroleum, granular (quarry) lands/easemen	ts																		
Factor Summers		1	1					1	1	1		1	1		1	1				
Factor Summary:			1					T					1		T					

PRACTICAL ALTERNATIVE EVALUATION	Factor: F	Protect the Natural Environment								Nat	ural Alternative 2A	Option 2 Plaza	B or C							
		-									Segments-Malden Ro	oad to North Talbot Rd								
				Malden Rd to Pulfor	d	Pi	ulford north of Lennon	Drain	North o	f Lennon Drain to Cou	ısineau Rd		Cousineau Rd to Ho	ward Ave		Howard Ave to Highw	vay 401		Highway 3 to North Ta	lbot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			ŀJ			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Sprin	g Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Lanuscapes		Youngstown Drain	Stream Corridor	Low	Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolle Drain					
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low						
			North of Spring Garden	Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
			Road									Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0	-	Total High	0	-	Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	0.58	High	Area Displaced	0.25	High	Area Displaced	0.36	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	2.31	Moderate	Area Displaced	0.29	Moderate	Area Displaced	1.19	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	7.57	Low	Area Displaced	4.23	Low	Area Displaced	3.00	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic	Community type, area, significance and	Total Area Displaced Basin Drain	10.46	Low	Total Area Displaced Basin Drain	4.77	Low	Total Area Displaced Basin Drain	4.55	L OW	Total Area Displaced Basin Drain	0.00	Low	Total Area Displaced Basin Drain	0.66	L ow	Total Area Displaced Basin Drain	0.00	L OW
	Communities/	sensitivity	Basin Brain	0.04	LOW	Daain Drain		EGW	Dasiri Dialit		Low	Daam Drain		Edw	Basin Brain		Low	Basin Brain		Low
			Cahill Drain Grand Maraia Drain	0.06	Moderate	Cahill Drain Grand Maraia Drain		Moderate	Cahill Drain Grand Maraia Drain	0.04	Moderate	Cahill Drain		Moderate	Cahill Drain Grand Maraia Drain		Moderate	Cahill Drain Grand Maraia Drain		Moderate
			Lennon Drain	0.06	Low	Lennon Drain		Low	Lennon Drain	0.05	Low	Lennon Drain	-	Low	Lennon Drain		Moderate	Lennon Drain		Low
			Marentette Drain	0.02	None	Marentette Drain		None	Marentette Drain	0.00	None	Marentette Drain		None	Marentette Drain		None	Marentette Drain		None
			Youngstown Drain	0.05	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.08	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.16	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.02	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	0.00	Area Displaced	0.00	0.00	Area Displaced	0.00	None
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare		55	Provincially Rare	0.1	35	Provincially Rare		26	Provincially Rare		0.00	Provincially Rare		0	Provincially Rare	-	0
Surface Water	Changes in surface wat	elarea of surface drainage altered by each			~														-	
	quantity)	number of surface water drainages crossings																		
		number of encroachments on or severances of	2																	
		surface water drainages																	_	
		Federal Water Quality Guidelines and																		
-		Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected			-								_		-	_		-		
	quantity)	area of groundwater recharge affected																	_	
		areas or seepage arrected																		
		area of water table affected by each alternativ (draw down zone)																		
		proximity of alternative to public and private drinking water wells																		
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easemen	Area in ha within ROW																		
										1										
Factor Summary:			1				г	1	- 1	T		Т	- 1			- 1				
Factor Score:	1		I	1	1	1	1	1		1		1	1	1	1	1	1	1	1	1

PRACTICAL ALTERNATIVE EVALUATION	Factor: F	Protect the Natural Environment									Natural Altern	ative 2B Plaza A								
											Segments-Malden F	Road to North Talbot Rd								
				Malden Rd to Pulf	ord		Pulford north of Lenn	on Drain	North c	of Lennon Drain to Cous	sineau Rd	с	ousineau Rd to Hov	vard Ave		Howard Ave to Highw	ray 401		Highway 3 to North Talb	oot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			I-J			J-K			K-L			L-M	
			Name	Type	Significance	Name	Туре	Significance	Name	Type	Significance	Namo	Type	Significance	Name	Туре	Significance	Name	Тире	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Sp	ring Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie Remnant to Spring Garde	Strip Corridor n	Moderate	Burke Drain	Stream Corridor	Low	Hone Blan					
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden Road	Matrix	Low							Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	1.41	High	Area Displaced	0.09	High	Area Displaced	0.36	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	6.29	Moderate	Area Displaced	0.27	Moderate	Area Displaced	1.04	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	10.91	Low	Area Displaced	3.58	Low	Area Displaced	2.46	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.11	Low	Basin Drain	3.34	Low	Basin Drain	3.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low
			Basin Drain	0.03	None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None
			Cahill Drain		Low	Cahill Drain		Low	Cahill Drain	0.02	Low	Cahill Drain		Low	Cahill Drain		Low	Cahill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.00	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain	0.00	Moderate	Cahill Drain		Moderate	Cahill Drain	0.05	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.06	Low	Grand Marais Drain		Low	Grand Marais Drain	0.05	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain Marentette Drain	0.02	Noderate	Lennon Urain Marentette Drain		Noderate	Lennon Urain Marentette Drain	0.05	None	Lennon Drain Marentette Drain		None	Lennon Drain Marentette Drain		Noderate	Lennon Drain Marentette Drain		Noderate
			Wolfe Drain	0.02	low	Wolfe Drain		Low	Wolfe Drain	0.01	Low	Wolfe Drain	0.59	Low	Wolfe Drain		low	Wolfe Drain		Low
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.09	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.38	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.26	Low	Area Displaced	0.00	Low	Area Displaced	0.02	Low	Area Displaced	0.59	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.05	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Denviotione/Careline	Incorate to Consider at	Cassies associate and similarity	Total Area Displaced		0.32	Total Area Displaced		0.00	Total Area Displaced	0.4	40	Total Area Displaced	-	0.59	Total Area Displaced		0.00	Total Area Displaced	0.	.00
Surface Water	Changes in surface wat	Species name, type and significance	FIOVINCIALLY Rate		89	FIOVINCIALLY RATE		23	FIOVINCIALLY KALE		53	FIOVINCIALLY Rate		0	FIOVINCIALLY KALE	-	0	FIOVINCIALLY KALE	-	0
Surface Water	conditions (quality and	alternative										_								
	quantity	by stream type																		
		surface water drainages																		
		Federal Water Quality Guidelines and Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected																		
	conditions (quality and	area of groundwater recharge affected																		
1	quantity)	areas of seepage affected	1	1									1			1			1	
		area of water table affected by each alternati (draw down zone)	v																	
		proximity of alternative to public and private drinking water wells																		
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easemen	Area in ha within ROW																		
Factor Summary:	+	1	1	1		1			-1	1					_1			1		
Easter Searce	+								1		1		1			1			1	

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment									Natural Alternativ	ve 2B Plaza B or (	•							
											Segments-Malden Ro	oad to North Talbot Rd								
				Malden Rd to Pulfo	rd	F	Pulford north of Lenno	on Drain	North	of Lennon Drain to Co	usineau Rd	c	Cousineau Rd to Howar	rd Ave		Howard Ave to Highwa	ıy 401		Highway 3 to North Talbo	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			ĿJ			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spri	ng Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie Rempant	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of Wolfe Drain	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie Remnant to Spring Garde	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wond Brain					
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden Road	Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
												Benson Drain	Stream Corridor	Low						
												No Name Tributary of	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0	Dickson Drain	Total High	0		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
		-		Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	0.37	High	Area Displaced	0.09	High	Area Displaced	0.36	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	2.29	Moderate	Area Displaced	0.27	Moderate	Area Displaced	1.04	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	7.58	Low	Area Displaced	3.58	Low	Area Displaced	2.46	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic	Community type, area, significance and	Basin Drain	0.04	Low	Basin Drain	0.01	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low
	Communities/	sensitivity																		
			Cahill Drain		Low	Cahill Drain		Low	Cahill Drain	0.02	Low	Cahill Drain		Low	Cahill Drain		Low	Cahill Drain		Low
			Canill Drain Cahill Drain		Moderate	Cahill Drain	-	Moderate	Cahill Drain	0.00	Moderate	Cahili Drain Cahili Drain		Moderate	Cahill Drain Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.06	Low	Grand Marais Drain		Low	Grand Marais Drain	0.00	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain	0.05	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Marentette Drain	0.02	None	Marentette Drain		None	Marentette Drain	0.04	None	Marentette Drain	0.50	None	Marentette Drain		None	Marentette Drain		None
			Wolfe Drain		Low	Wolfe Drain		LOW	Wolfe Drain	0.01	LOW	Wolfe Drain	0.59	LOW	Wolfe Drain		LOW	Wolfe Drain		LOW
			Youngstown Drain	0.05	Low	Youngstown Drain		Low	Youngstown Drain	0.20	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.38	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.16	Low	Area Displaced	0.00	Low	Area Displaced	0.02	Low	Area Displaced	0.59	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Total Area Displaced	0.02	18	Total Area Displaced	0.00	0.00	Total Area Displaced	0.00	40	Total Area Displaced	0.00	59	Total Area Displaced	0.00	00	Total Area Displaced	0.00	0
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare	0	49	Provincially Rare	`	23	Provincially Rare		33	Provincially Rare	0.	0	Provincially Rare		0	Provincially Rare	0.0	0
Surface Water	Changes in surface wate conditions (quality and	area of surface drainage altered by each alternative																		
	quantity)	number of surface water drainages crossings by stream type																		
		surface water drainages degree of compliance with Provincial and																		
		Federal Water Quality Guidelines and Stormwater Management requirements																		
Groundwater	Change in groundwater	area of intiltration zones affected							+							+				
	quantity)	areas of groundwater recharge anected												_		-	_			
		area of water table affected by each alternativ		1	-	1	1	-	+	1	+	1	+		1	+	-	1	1	1
		(draw down zone) proximity of alternative to public and private																		
		drinking water wells																		
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easement	Area in ha within ROW																		
				l														l		<u> </u>
Factor Summary:							-							-					-	
Factor Score:	1		1	1											1			1		

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	Protect the Natural Environment								Na	atural Alternative	e 2B Option 2 Plaza	a A							
	•										Segments-Malden F	Road to North Talbot Rd								
				Malden Rd to Pul	ford		Pulford north of Lennor	n Drain	North	of Lennon Drain to Cous	sineau Rd	c	ousineau Rd to Hov	ward Ave		Howard Ave to Highw	ay 401		Highway 3 to North Talb	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			ЬJ			J-K			K-L			L-M	
			Namo	Тире	Significance	Name	Туре	Significance	Name	Туре	Significance	Name	Type	Significance	Name	Туре	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	I andscape name, type and significance	Basin Drain	Stream Corridor	low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				Remnant St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolfe Drain					
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garden Road	n Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
												Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
				Tatal I Kab			Tatal Link			Tetel I Keb	0	No Name Tributary of Dickson Drain	Stream Corridor	Low		Total Ulah			TatallEab	
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	1.41	High	Area Displaced	0.09	High	Area Displaced	0.36	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	6.29	Moderate	Area Displaced	0.27	Moderate	Area Displaced	1.19	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	10.91	Low	Area Displaced	3.57	Low	Area Displaced	3.09	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.11	Low	Basin Drain	3.93	Low	Basin Drain	4.64	Low	Basin Drain	0.00	Low	Basin Drain	0.66	Low	Basin Drain	0.00	Low
		,	Basin Drain	0.03	None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None	Basin Drain		None
			Cahill Drain		Low	Cahill Drain		Low	Cahill Drain	0.02	Low	Cahill Drain		Low	Cahill Drain		Low	Cahill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.00	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.05	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.06	Low	Grand Marais Drain		Low	Grand Marais Drain	0.05	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Marentette Drain	0.02	None	Marentette Drain		None	Marentette Drain	0.05	None	Marentette Drain		None	Marentette Drain		None	Marentette Drain		None
			Wolfe Drain		Low	Wolfe Drain		Low	Wolfe Drain	0.01	Low	Wolfe Drain	0.59	Low	Wolfe Drain		Low	Wolfe Drain		Low
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.09	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low	Youngstown Drain	0.00	Low
			Area Displaced	0.00	Low	Area Displaced	0.00	Low	Area Displaced	0.36	Low	Area Displaced	0.00	low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.05	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
			Total Area Displaced		0.32	Total Area Displaced	0	.00	Total Area Displaced	0.4	40	Total Area Displaced		0.59	Total Area Displaced		0.00	Total Area Displaced	0.	00
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare		89	Provincially Rare		23	Provincially Rare	Ę	33	Provincially Rare		0	Provincially Rare		0	Provincially Rare		0
Surface Water	conditions (quality and	erarea of surface drainage altered by each alternative																		
	quantity)	number of surface water drainages crossings by stream type																		
		surface water drainages																	_	
		Federal Water Quality Guidelines and Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected	1	1		1	1		1	1	1		1		1	1				1
	conditions (quality and	area of groundwater recharge affected																		
	quantity)	areas of seepage affected																		
		area of water table affected by each alternativ (draw down zone)	<i>,</i>																	
		proximity of alternative to public and private drinking water wells																		
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easement	Area in ha within ROW																		
Easter Summaril		1																		
Factor Summary:						1			1				1					1		

PRACTICAL ALTERNATIVE EVALUATION	Factor: F	Protect the Natural Environment								Natu	Iral Alternative 2	B Option 2 Plaza E	B or C							
											Segments-Malden F	Road to North Talbot Rd								
				Malden Rd to Pul	lford		Pulford north of Lennon	Drain	North	of Lennon Drain to Cous	sineau Rd	c	Cousineau Rd to Hov	vard Ave		Howard Ave to Highw	ray 401		Highway 3 to North Talb	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			I-J			Ј-К			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Sp	ring Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie Remnant	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of Wolfe Drain	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				St. Clair college Prairie Remnant to Spring Garde	Strip Corridor an	Moderate	Burke Drain	Stream Corridor	Low						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of Burke Draine	Stream Corridor	Low						
			North of Spring Garder Road	n Matrix	Low							Howard Avenue Drain	Stream Corridor	Low						
												Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
				Total High			Total High	0		Total High	0	Dickson Drain	Stream Corridor	Low		Total High	0		Total High	0
				Total Moderate	1		Total Moderate	0		Total Moderate	2		Total Moderate	0		Total Moderate	0		Total Moderate	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	0.37	High	Area Displaced	0.09	High	Area Displaced	0.36	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	2.29	Moderate	Area Displaced	0.27	Moderate	Area Displaced	1.19	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	7.58	Low	Area Displaced	3.57	Low	Area Displaced	3.09	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic	Community type area significance and	Total Area Displaced Basin Drain	10.24	Low	Total Area Displaced Basin Drain	3.93	Low	Total Area Displaced Basin Drain	4.64	L OW	Total Area Displaced Basin Drain	0.00	low	Total Area Displaced Basin Drain	0.66	Low	Total Area Displaced Basin Drain	0.00	L OW
	Communities/	sensitivity	Cabill Drain	0.04	Low	Cabill Drain		Low	Cabill Drain	0.02	Low	Cabill Drain		Low	Cabill Drain		Low	Cabill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.02	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.05	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.06	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain	0.05	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Watentette Drain	0.02	None	Warentette Drain Wolfe Drain		None	Warentette Drain Wolfe Drain	0.01	None	Wolfe Drain	0.59	None	Wolfe Drain		None	Wolfe Drain		None
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain	0.55	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Youngstown Drain	0.05	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.38	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.16	Low	Area Displaced	0.00	Low	Area Displaced	0.02	Low	Area Displaced	0.59	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Total Area Displaced	0.02	0.18	Total Area Displaced	0.00	none	Total Area Displaced	0.00	10	Total Area Displaced	0.00	0.59	Total Area Displaced	0.00	0.00	Total Area Displaced	0.00	none
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare		49	Provincially Rare		23	Provincially Rare		33	Provincially Rare		0	Provincially Rare		0	Provincially Rare		0
Surface Water	Changes in surface wat conditions (quality and	e area of surface drainage altered by each alternative																		
	quantity)	number of surface water drainages crossings by stream type	i																	
		number of encroachments on or severances of surface water drainages	q																	
		degree of compliance with Provincial and Federal Water Quality Guidelines and																		
	<u> </u>	Stormwater Management requirements					_				_									_
Groundwater	conditions (quality and	area of infiltration zones affected																		
	quantity)	areas of seenage affected									+					+			-	
		area of water table affected by each alternativ	v																	
		(uraw down zone) proximity of alternative to public and private							_											
Other Natural Resources	Impacts to mineral	Area in ha within ROW														-				
other Natural Resources	petroleum, granular (quarry) lands/easemen	its																		
Franker Cumme			<u> </u>																	
Factor Summary:			1	1				1		1	1		1			1		1		
	1				1									1						

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment									Natural Altern	ative 3 Plaza A								
											Segments-Malden R	oad to North Talbot Rd								
				Malden Rd to Pulfo	rd		Pulford north of Lenno	on Drain	North	of Lennon Drain to Co	usineau Rd		Cousineau Rd to Howard	l Ave	ŀ	Howard Ave to Highway	/ 401	н	ighway 3 to North Talb	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			ŀJ			J-K			K-L			L-M	
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Name Basin Drain	Type Stream Corridor	Significance	Name Oakwood Bush to Spr	Type	Significance	Name Lennon Drain	Type Stream Corridor	Significance Low	Name Wolfe Drain	Type Stream Corridor	Significance	Name Wolfe Drain	Type Stream Corridor	Significance Low	Name Wolfe Drain	Type Stream Corridor	Significance
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI Lennon Drain	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Collins Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low			
			Marentette Drain	Stream Corridor	Low				Remnant St. Clair college Prairie	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low	Wolfe Drain					
			Grand Marais Drain	Stream Corridor	Moderate				Remnant to Spring Garde Cahill Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low						-
			North of Spring Garder	Matrix	Low							Burke Draine Howard Avenue Drain	Stream Corridor	Low						-
			Road									Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low						
												No Name Tributary of Dickson Drain	Stream Corridor	Low						
				Total High	0		Total High	0		Total High	0		Total High	0		Total High	0		Total High	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	1.40	High	Area Displaced	0.00	High	Area Displaced	0.09	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	6.29	Moderate	Area Displaced	0.26	Moderate	Area Displaced	0.85	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Total Area Displaced	9.43	LOW	Total Area Displaced	2.09	LOW	Total Area Displaced	3.38	LOW	Total Area Displaced	0.00	LOW	Total Area Displaced	0.66	LOW	Total Area Displaced	0.00	LOW
	Impacts to Aquatic Communities/	Community type, area, significance and sensitivity	Basin Drain	0.11	Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low	Basin Drain		Low
			Basin Drain	0.03	None	Basin Drain		None	Basin Drain	0.00	None	Basin Drain		None	Basin Drain		None	Basin Drain		None
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.00	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.03	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.08	Low	Grand Marais Drain		Low	Grand Marais Drain	0.05	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low
			Marentette Drain	0.03	None	Marentette Drain		None	Marentette Drain	0.05	None	Marentette Drain		None	Marentette Drain		None	Marentette Drain		None
			Wolfe Drain		Low	Wolfe Drain		Low	Wolfe Drain	0.01	Low	Wolfe Drain	0.12	Low	Wolfe Drain		Low	Wolfe Drain		Low
			Wolfe Drain	0.00	Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain		Moderate
			Area Displaced	0.08	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.37	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.27	Low	Area Displaced	0.00	Low	Area Displaced	0.01	Low	Area Displaced	0.12	Low	Area Displaced	0.00	Low	Area Displaced	0.00	Low
			Area Displaced	0.06	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare	0	.32	Provincially Rare		6	Provincially Rare		41	Provincially Rare	0.1	0	Provincially Rare	0.	0	Provincially Rare	0.	0
Surface Water	Changes in surface wate	area of surface drainage altered by each			-									-				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		-
	conditions (quality and	alternative																		_
	quantity)	number of surface water drainages crossings by stream type	-																	
		surface water drainages																		
		Federal Water Quality Guidelines and																		
	a	Stormwater Management requirements			_	_									_		_	_		
Groundwater	conditions (quality and	area of inflitration zones affected area of groundwater recharge affected															-			
	quantity)	areas of seepage affected																		-
		area of water table affected by each alternativ	v																	
		proximity of alternative to public and private																		-
Other Natural Resources	Impacts to mineral	Area in ha within ROW					-					+		+						+
	petroleum, granular (quarry) lands/easement	s																		
Factor Summary:		1	<u> </u>		<b>L</b>	1		1			1			1	<u> </u>			<b>L</b>	<u>I</u>	
Factor Score:															1	1			1	
1 High Impost 2 Medium Imp	act 2 Low Impact 4	Noutral/No Impact E Low Papafit & Mad	lium Ropofit 7 High R	opofit		1				1			4	1	1	!	4		Į	

PRACTICAL ALTERNATIVE EVALUATION	Factor: F	rotect the Natural Environment									Natural Alternat	ive 3 Plaza B or C	:							
											Segments-Malden R	oad to North Talbot Rd								
				Malden Rd to Pulfor	rd		Pulford north of Lennon	Drain	North	of Lennon Drain to Cou	usineau Rd	c	Cousineau Rd to How	vard Ave		Howard Ave to Highw	ray 401		Highway 3 to North Talb	ot Rd
Performance Measure	Criteria/Indicator	Measurement/Units		G-H			H-I			Ы			J-K			K-L			L-M	
			Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance	Name	Type	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Basin Drain	Stream Corridor	Low	Oakwood Bush to Spr	ing Strip Corridor	Low	Lennon Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low	Wolfe Drain	Stream Corridor	Low
	Landscapes		Youngstown Drain	Stream Corridor	Low	Garden ANSI	Stream Corridor	Low	St. Clair College Prairie	Patch	Moderate	Colline Drain	Stream Corridor	Low	No Name Tributany of	f Stream Corridor	Low			
			Toungstown Drain	offean condor	Low	Lennon Diam	Stream Comdo	LOW	Remnant	i aton	Moderate	Comina Diam	Stream Contabi	Eow	Wolfe Drain	ou canadi comadi	LOW			
			Marentette Drain	Stream Corridor	Low				St. Clair College Prairie Remnant to Spring Garde	Strip Corridor	Moderate	Burke Drain	Stream Corridor	Low						
			Grand Marais Drain	Stream Corridor	Moderate				Cahill Drain	Stream Corridor	Low	No Name Tributary of	Stream Corridor	Low					-	
			North of Spring Garde	en Matrix	Low							Burke Draine Howard Avenue Drain	Stream Corridor	low						
			Road																	
												Benson Drain	Stream Corridor	Low						
												Dickson Drain	Stream Corridor	Low					-	
												No Name Tributary of			-					
					-						-	Dickson Drain	Stream Corridor	Low			-			-
				Total High	1		Total High	0		Total High	2	-	Total High	0	-	Total High	0	-	Total High	0
				Total Low	4		Total Low	2		Total Low	2		Total Low	8		Total Low	2		Total Low	1
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	0.41	High	Area Displaced	0.00	High	Area Displaced	0.09	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High
			Area Displaced	2.29	Moderate	Area Displaced	0.26	Moderate	Area Displaced	0.85	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	6.53	Low	Area Displaced	1.82	Low	Area Displaced	2.44	Low	Area Displaced	0.00	Low	Area Displaced	0.66	Low	Area Displaced	0.00	Low
	Impacts to Aquatic	Community type, area, significance and	Basin Drain	0.04	Low	Basin Drain	2.09	Low	Basin Drain	3.36	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low	Basin Drain	0.00	Low
	Communities/ Ecosystems	sensitivity	_																	
			Cahill Drain		Low	Cahill Drain		Low	Cahill Drain	0.00	Low	Cahill Drain		Low	Cahill Drain		Low	Cahill Drain		Low
			Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain	0.03	Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate	Cahill Drain		Moderate
			Grand Marais Drain	0.08	Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain		Low	Grand Marais Drain	-	Low
			Lennon Drain	0.00	Moderate	Lennon Drain		Moderate	Lennon Drain	0.05	Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate	Lennon Drain		Moderate
			Warentette Drain	0.02	None	Warentette Drain Wolfe Drain		None	Warentette Drain Wolfe Drain	0.01	None	Warentette Drain Wolfe Drain	0.12	None	Warentette Drain Wolfe Drain		None	Warentette Drain Wolfe Drain		None
			Wolfe Drain		Moderate	Wolfe Drain		Moderate	Wolfe Drain	0.29	Moderate	Wolfe Drain	0.12	Moderate	Wolfe Drain		Moderate	Wolfe Drain	-	Moderate
			Youngstown Drain	0.03	Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low	Youngstown Drain		Low
			Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.37	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate
			Area Displaced	0.02	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None	Area Displaced	0.00	None
			Total Area Displaced	0.17		Total Area Displaced	0.00		Total Area Displaced	0.38		Total Area Displaced	0.12		Total Area Displaced	0.00		Total Area Displaced	0.00	
Populations/Species	Impacts to Species at	Species name, type and significance	Provincially Rare	45.	00	Provincially Rare	6.	00	Provincially Rare	41	.00	Provincially Rare		0.00	Provincially Rare		0.00	Provincially Rare		DO
Surface Water	Changes in surface wate conditions (quality and	e area of surface drainage altered by each alternative																		
	quantity)	number of surface water drainages crossings	5																	
		number of encroachments on or severances	a																	
		surface water drainages																		
		degree of compliance with Provincial and Federal Water Quality Guidelines and																		
		Stormwater Management requirements																		
Groundwater	Change in groundwater	area of infiltration zones affected																		
	conditions (quality and	area of groundwater recharge affected																		
	qualitity)	areas of seepage affected																		
		area or water table affected by each alternati (draw down zone)	v								1									
		proximity of alternative to public and private						1				1								
		drinking water wells																		
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easemen	Area in ha within ROW																		
Factor Summary:			-																	
IEWTOT SCOTO																				

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment	Natural Nev	v Alternative Pa	rkway Plaza A		
Performance Measure	Criteria/Indicator	Measurement/Units		New Parkway			
			Name	Type/Area	Significance	Total Area	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, Type/Area and significance	Basin Drain	Stream Corridor	Low		
	Landscapes		Youngstown Drain	Stream Corridor	Low		
			Marentette Drain	Stream Corridor	Low		
			Grand Marais Drain	Stream Corridor	Moderate		
			North of Spring Garden Road	Matrix	Low		
				Total High	0	0	Total High
				Total Moderate	1	1	Total Moderate
				Total Low	4	4	Total Low
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community Type/Area, area, significance and sensitivity	Area Displaced	2.54	High	2.54	Total High
			Area Displaced	1.05	Moderate	1.05	Total Moderate
			Area Displaced	39.00	Low	39.00	Total Low
			Total Area Displaced	42.59		42.59	Total Area Displaced
	Impacts to Aquatic Communities/	community Type/Area, area, significance and sensitivity	Basin Drain	0.11	Low		
			Basin Drain	0.03	None		
			Burk Drain	0.11	Low		
			Burk Drain	0.00	low		
				0.01	Low		
			Cahill Drain	0.00	Moderate		
			Collins Drain	0.01			
			Grand Marais Drain	0.13			
			Lennon Drain	0.10	Moderate		
			Marentette Drain	0.04	None		
			No Name3	0.01	None		
			No Name4	0.11	None		
			No Name5	0.00	None		
			Wolfe Drain	1.03	Low		
			Wolfe Drain	0.29	Moderate		
			Youngstown Drain	0.06	Low		
			Area Displaced	0.47	Moderate	0.47	Total Moderate
I	I	1	Area Displaced	1.47	Low	1.47	Total Low

		1	Area Displaced	0.20	None	0.20	Total None
			Total Area Displaced	2.14		2.14	Total Area Displaced
Populations/Species	Impacts to Species at Risk	Species name, Type/Area and significance	Provincially Rare Specimens/Colonies	180	High	180	Total Provincially Rare Specimens/Colonies
Surface Water	Changes in surface water conditions (quality and	area of surface drainage altered by each alternative					
	quantity)	number of surface water drainages crossings by stream Type/Area					
		number of encroachments on or severances of surface water drainages					
		degree of compliance with Provincial and Federal Water Quality Guidelines and Stormwater Management requirements					
Groundwater	Change in groundwater	area of infiltration zones affected					
	conditions (quality and	area of groundwater recharge affected					
	quantity)	areas of seepage affected					
		area of water table affected by each alternative (draw down zone)					
		proximity of alternative to public and private drinking water wells					
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easements	Area in ha within ROW					
Factor Summary:							
Factor Score:							

PRACTICAL ALTERNATIVE EVALUATION	Factor: P	rotect the Natural Environment	Natural New Alt	ernative Parkw	ay Plaza B, B1 or C		
Performance Measure	Criteria/Indicator	Measurement/Units		New Parkway			
			Name	Туре	Significance	Total Area	Significance
Ecological Landscapes	Impacts to Ecological Landscapes	Landscape name, type and significance	Basin Drain	Stream Corridor	Low		
			Youngstown Drain	Stream Corridor	Low		
			Marentette Drain	Stream Corridor	Low		
			Grand Marais Drain	Stream Corridor	Moderate		
			North of Spring Garden Road	Matrix	Low		
				Total High	0	0	Total High Total Moderate
				Total Low	4	4	Total Low
Communities/Ecosystems	Impacts to Terrestrial Communities/ Ecosystems	Community type, area, significance and sensitivity	Area Displaced	1.47	High	1.47	′Total High
			Area Displaced	1.26	Moderate	1.26	Total Moderate
			Area Displaced	34.48	Low	34.48	Total Low
			Total Area Displaced	37.21		37.21	Total Area Displaced
	Impacts to Aquatic	Community type, area, significance and	Basin Drain	0.05	Low		
			Burk Drain	0.11	Low		
				0.00	None		
			Cahill Drain		LOW		
				0.00	Moderate		
				0.08			
			Grand Marais Drain	0.01			
			Lennon Drain	0.10	Moderate		
			Marentette Drain	0.04	None		
			No Name3	0.01	None		
			No Name4	0.11	None		
			No Name5	0.00	None		
			Wolfe Drain	1.03	Low		
			Wolfe Drain	0.29	Moderate		
			Youngstown Drain	0.04	Low		
I		1	Area Displaced	0.47	Moderate	0.47	Total Moderate

			Area Displaced	1.39	Low		
						1.39	Total Low
			Area Displaced				
				0.17	None	0.17	Total None
			Total Area Displaced	2.0	3	2.03	Total Area Displaced
Populations/Species	Impacts to Species at Risk	Species name, Type/Area and significance	Provincially Rare Specimens/Colonies	14	1	141	Total Provincially Rare Specimens/Colonies
Surface Water	Changes in surface water conditions (quality and	area of surface drainage altered by each alternative					
	quantity)	number of surface water drainages crossings by stream type					
		number of encroachments on or severances of surface water drainages					
		degree of compliance with Provincial and					
		Federal Water Quality Guidelines and					
		Stormwater Management requirements					
Groundwater	Change in groundwater conditions (quality and	area of infiltration zones affected					
	quantity)	area of groundwater recharge affected					
		areas of seepage affected					
		area of water table affected by each					
		alternative (draw down zone)					
		proximity of alternative to public and private drinking water wells					
Other Natural Resources	Impacts to mineral,	Area in ha within ROW					
Factor Summary:							
Factor Score:							
1-High Impact 2-Medium Im	npact 3-Low Impact 4-N	leutral/No Impact 5-Low Benefit 6-Mediu	m Benefit 7-High Ben	efit			

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect th	e Natural Environment					N	atural Plazas	and Crossings					
								Pla	za A					
			Fr	om Crossing A		Fr	om Crossing B		F	rom Crossing C		Fr	om Crossing C	
Performance Measure	Criteria/ Indicator	Measurement/ Units		A-G			B-G			C-E-G			C-G	
			Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Detroit River	Stream Corridor	High	Detroit River	Stream Corridor	High	Detroit River	Stream Corridor	High	Detroit River	Stream Corridor	High
			Healy Drain	Stream Corridor	Low	Healy Drain	Stream Corridor	Low	McKee Creek	Stream Corridor	Low	McKee Creek	Stream Corridor	Low
			North of Amanda Street	Matrix	Moderate	North of Amanda Street	Matrix	Moderate	Healy Drain	Stream Corridor	Low	North of Amanda Street	Matrix	Moderate
			Malden Park to Prairie Remnants ANSI	Strip Corridor	Moderate	Malden Park to Prairie Remnants ANSI	Strip Corridor	Moderate	North of Amanda Street	Matrix	Moderate	Malden Park to Prairie Remnants ANSI	Strip Corridor	Moderate
			Chappus Street West of Sandwich Street NHF	Patch	Low	Ontario Power Generation NHF	Patch	Low	Malden Park to Prairie Remnants ANSI	Strip Corridor	Moderate			
									Sterling Marine Fuels NHF	Patch	Low			
Communities/ Ecosystems	Impacts to Terrestrial Communities/	Community type, area, significance and sensitivity												
	Ecosystems	,	Area Displaced	2.98	High	Area Displaced	2.70	High	Area Displaced	2.69	High	Area Displaced	2.70	High
			Area Displaced	1.83	Moderate	Area Displaced	1.82	Moderate	Area Displaced	2.74	Moderate	Area Displaced	2.73	Moderate
			Area Displaced	27.77	Low	Area Displaced	26.24	Low	Area Displaced	25.44	Low	Area Displaced	22.86	Low
			Total Area Displaced	32.58		Total Area Displaced	30.77		I otal Area Displaced	30.87		Total Area Displaced	28.29	
	Impacts to Aquatic Communities/	Community type, area, significance and	Healy Drain	0.01	Low	Healy Drain	0.03	Low	Healy Drain	0.03	Low	McKee Creek	0.03	Moderate
			McKee Drain	0.05	Moderate	Healy Drain	0.07	None	Healy Drain	0.04	None	McKee Drain	0.05	Moderate
			McKee Drain	0.11	None	McKee Drain McKee Drain	0.05	Moderate	McKee Creek	0.03	Moderate	McKee Drain	0.11	None
			Detroit River	0.05 Pier	Moderate	Titcombe Drain	0.11	Moderate	McKee Drain	0.05	None	No Name Tributary	0.05	
						Detroit River	Pier	Moderate	Titcombe Drain	0.05	Moderate		0.01	
			Area Displaced	0.10	Moderate	Area Displaced	0.10	Moderate	Area Displaced	0.13	Moderate	Area Displaced	0.13	Moderate
			Area Displaced	0.01	Low	Area Displaced	0.03	Low	Area Displaced	0.03	Low	Area Displaced	0.01	Low
			Area Displaced	0.11	None	Area Displaced	0.18	None	Area Displaced	0.15	None	Area Displaced	0.11	None
		-	Total Area Displaced	0.22	2	Total Area Displaced	0.31		Total Area Displaced	0.3	1 Low	Total Area Displaced	0.2	5
Populations/ Species	Impacts to Species at Risk	Species name, type and significance	Provincially Rare Specimens/Colonies	232	2 High	Provincially Rare Specimens/Colonies	223	High	Provincially Rare Specimens/Colonies	23	1 High	Provincially Rare Specimens/Colonies	186	6 High
Surface Water	Changes in surface	area of surface drainage												
	water conditions (quality and quantity)	altered by each number of surface water												
		drainages crossings by number of												
		encroachments on or												
		with Provincial and Federal Water Quality												
Groundwater	Change in	area of infiltration zones												
	groundwater	area of groundwater												
	conditions (quality	areas of seepage												
	and quantity)	area of water table												
		proximity of alternative to												
Other Natural	Imposto to minoral								<b> </b>	ł			ļ	<b>↓</b>
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easements	Area in na witnin KOW												
Factor Summary:		-	-		•	-			-	-	-	-	-	
Factor Score:														
						•				-	•	•		

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect th	e Natural Environment				Natural Plazas and Crossings							
					za A								
Performance Measure Criteria/ Indicator			Fr	om Crossing A		Fr	om Crossing B		From Crossing C				
	Measurement/ Units	A-G				B-G		C-E-G					
		Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Sig			

	Fr	From Crossing C										
		C-G										
gnificance	Name	Type/Area	Significance									

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect th	ne Natural Environment	vironment Natural Plazas and Crossings Plaza B											
		1					Plaza B							
						F	From Crossing C							
Performance Measure	Criteria/ Indicator	Measurement/ Units		C-E			E-F			F-G				
			Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance			
Ecological Landscapes	Impacts to Ecological	Landscape name, type and significance	Detroit River	Stream Corridor	High	Broadway Drain	Stream Corridor	Low	McKee Drain	Stream Corridor	Low			
			McKee Creek	Stream Corridor	Low				Titcombe Drain	Stream Corridor	Low			
			Healy Drain	Stream Corridor	Low				North of Amanda Street	Matrix	Moderate			
			Broadway Drain	Stream Corridor	Low				Malden park to Prairie Remnants ANSI	Strip Corridor	Moderate			
			Sterling Marine Fuels NHF	Patch	Moderate									
Communities/	Importo to				High					<u> </u>				
Ecosystems	Terrestrial Communities/	significance and sensitivity			nigri									
	Ecosystems		Area Displaced	1.12	Madarata	Area Displaced	0.01	High	Area Displaced	0.89	High			
			Area Displaced	0.90		Area Displaced	6.18		Area Displaced	13 55				
			Total Area Displaced	18.86	2010	Total Area Displaced	6.89	2011	Total Area Displaced	14.93				
	Impacts to Aquatic Communities/	Community type, area, significance and	Broadway Drain	0.05	Low	Healy Drain	0.03	None	McKee Drain	0.02	Moderate			
			Healy Drain	0.08	Low	McKee Drain	0.07	Moderate	McKee Drain	0.11	None			
			Healy Drain	0.16	None	McKee Drain	0.07	Moderate	Titcombe Draine	0.02	Moderate			
			McKee Creek	0.03	Moderate									
			Detroit River	Pier	Moderate									
			No Name Tributary	0.00	Low									
			Area Displaced	0.03	Moderate	Area Displaced	0.14	Moderate	Area Displaced	0.04	Moderate			
			Area Displaced	0.03		Area Displaced	0.00		Area Displaced	0.04				
			Area Displaced	0.16	None	Area Displaced	0.03	None	Area Displaced	0.11	None			
			Total Area Displaced	0.32	2	Total Area Displaced	0.1	7	Total Area Displaced	0.15	5			
Populations/ Species	Impacts to Species at Risk	Species name, type and significance	Provincially Rare Specimens/Colonies	83	3 High	Provincially Rare Specimens/Colonies	30	) High	Provincially Rare Specimens/Colonies	82	2 High			
Surface Water	Changes in surface	area of surface drainage												
	water conditions	altered by each												
	(quality and quantity)	number of surface water drainages crossings by												
		number of encroachments on or												
		degree of compliance with Provincial and Federal Water Quality												
Groundwater	Change in	area of infiltration zones												

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect th	e Natural Environment	Natural Plazas and Crossings											
				Plaza B										
				From Crossing C										
Performance Measure	Criteria/ Indicator	Measurement/ Units	C-E				E-F		F-G					
			Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance			
	groundwater conditions (quality and quantity)	area of groundwater												
co ar		areas of seepage												
		area of water table affected by each												
		proximity of alternative to public and private												
Other Natural Resources	Impacts to mineral, petroleum, granular (quarry) lands/easements	Area in ha within ROW												
Factor Summary:														
Factor Score:														
1-High Impact 2-Me	lium Impact 3-Low Impact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit													

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect th	ne Natural Environment		Natural Plazas and Crossings										
								Pla	za B1					
					From C	rossing B			From Crossing C					
Performance Measure	Criteria/ Indicator	Measurement/ Units		B-F			F-G			C-F			F-G	
			Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance
Ecological	Impacts to	Landscape name, type	Detroit River	Stream Corridor	High	McKee Drain	Stream Corridor	Low	Detroit River	Stream Corridor	High	McKee Drain	Stream Corridor	Low
Landscapes	Ecological	and significance	Healy Drain	Stream Corridor	Low	Titcombe Drain	Stream Corridor	Low	McKee Creek	Stream Corridor	Low	Titcombe Drain	Stream Corridor	Low
			Broadway Drain	Stream Corridor	Low	North of Amanda Street	Matrix	Moderate	Healy Drain	Stream Corridor	Low	North of Amanda Street	Matrix	Moderate
			Ontario Power	Patch	Low	Malden Park to Prairie	Strip Corridor	Moderate	Broadway Drain	Stream Corridor	Low	Malden Park to Prairie	Strip Corridor	Moderate
			Generation NHF			Remnants ANSI			Sterling Marine Fuels	Patch	Low	Remnants ANSI		
									NHF					
Communities/	Impacts to	Community type, area												
Ecosystems	Terrestrial	significance and												
	Ecosystems	Sensitivity	Area Displaced	0.20	High	Area Displaced	0.89	High	Area Displaced	0.20	High	Area Displaced	0.89	High
	,		Area Displaced	0.70	Moderate	Area Displaced	0.49	Moderate	Area Displaced	1.60	Moderate	Area Displaced	0.49	Moderate
			Area Displaced	28.58	Low	Area Displaced	14.21	Low	Area Displaced	27.77	Low	Area Displaced	14.21	Low
			Total Area Displaced	29.48		Total Area Displaced	15.59		Total Area Displaced	29.57		Total Area Displaced	15.59	
	Impacts to Aquatic Communities/	Community type, area, significance and	Healy Drain	0.07	Low	McKee Drain	0.02	Moderate	Healy Drain	0.05	Low	McKee Drain	0.02	Moderate
			Healy Drain	0.24	None	McKee Drain	0.11	None	Healy Drain	0.22	None	McKee Drain	0.11	None
			McKee Drain	0.06	Moderate	Titcombe Drain	0.02	Moderate	McKee Creek	0.03	Moderate	Titcombe Drain	0.02	Moderate
			McKee Drain	0.07	Moderate				McKee Drain	0.06	Moderate			
			Detroit River	Pier	Moderate				McKee Drain	0.07 Dior	Moderate			
									No Name Tributary		low			
			Area Displaced	0.13	Moderate	Area Displaced	0.04	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.04	Moderate
			Area Displaced	0.07	Low	Area Displaced	0.00	Low	Area Displaced	0.05	Low	Area Displaced	0.00	Low
			Area Displaced	0.24	None	Area Displaced	0.11	None	Area Displaced	0.22	None	Area Displaced	0.11	None
			Total Area Displaced	0.44	1	Total Area Displaced	0.15	5	Total Area Displaced	0.43	3	Total Area Displaced	0.1	5
Populations/ Species	Impacts to Species	Species name, type and	Provincially Rare	100	) High	Provincially Rare	85	5 High	Provincially Rare	100	High	Provincially Rare	8	5 High
Surface Water	at Risk Changes in surface	significance area of surface drainage	Specimens/Colonies			Specimens/Colonies			Specimens/Colonies			Specimens/Colonies		
	water conditions	altered by each												
	(quanty and quantity	drainages crossings by		_										
		number of encroachments on or												
		degree of compliance												
		with Provincial and Federal Water Quality												
Groundwater	Change in	area of infiltration zones												
	groundwater	area of groundwater												
	conditions (quality	areas of seepage												
	and quantity)	area of water table affected by each												
		proximity of alternative to												
Other Natural	Impacts to mineral	Area in ha within ROW									<del> </del>			
Resources	petroleum, granular (quarry) lands/easements													
Eactor Summany		<u> </u>		1	1	1	I	1	1	1	I		1	1
Factor Score:					1	1		1	1	1	1		1	1
1 Lligh Impact O Ma	dium Imment Ola	ulassast 4 Nautral/Na l	Law Denefit	C Madium Danaf	it Zilligh Depetit	<u>I</u>	Į	<u>I</u>	<u>I</u>		<u> </u>	<u>ļ</u>		<u> </u>

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect th	e Natural Environment	Natural Plaz						s and Crossings				
				a B1									
	Performance Measure Criteria/ Indicator	Measurement/ Units											
Performance Measure				B-F			F-G			C-F			
				Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Sig		

From Crossing C											
		F-G									
gnificance	Name	Type/Area	Significance								

PRACTICAL ALTERNATIVE EVALUATION	Factor: Protect th	ne Natural Environment	Natural Plazas and Crossings													
								Pla	aza C						1	
								From C	rossing C							
Performance Measure	Criteria/ Indicator	Measurement/ Units		C-D			D-E			E-F			F-G			
			Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Name	Type/Area	Significance	Total Area	Significance
Ecological Landscapes	Impacts to Ecological Landscapes	Landscape name, type and significance	Detroit River	Stream Corridor	High	Healy Drain	Stream Corridor	Low				McKee Drain	Stream Corridor	Low		
			McKee Creek	Stream Corridor	Low	Ontario Power Generation NHF	Patch	Low				Titcombe Drain	Stream Corridor	Low		
			Healy Drain	Stream Corridor	Low							North of Amanda Street	Matrix	Moderate		
			Sterling Marine Fuels NHF	Patch	Low							Malden Park to Prairie Remnants ANSI	Strip Corridor	Moderate		
Communities/ Ecosystems	Impacts to Terrestrial Communities/	Community type, area, significance and													16.16	Total High
	Ecosystems	Sensitivity	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.00	High	Area Displaced	0.89	High	1 '	
			Area Displaced	1.62	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.49	Moderate	16.60	Total Moderate
			Area Displaced	6.97	Low	Area Displaced	2.76	Low	Area Displaced	10.09	Low	Area Displaced	13.41	Low	256.87	Total Low
			I otal Area Displaced	8.59		Total Area Displaced	2.76		I otal Area Displaced	10.09		Total Area Displaced	14.79		289.65	Total Area Displaced
	Impacts to Aquatic Communities/	Community type, area, significance and	Healy Drain	0.02	None	Healy Drain	0.05	None	Healy Drain	0.04	Low	McKee Drain	0.02	Moderate		
			McKee Drain	0.07	Moderate							McKee Drain	0.11	None	'	
			McKee Drain	0.08 Dier	Moderate							l Itcombe Drain	0.02	Moderate	í'	
			No Name Tributary	0.15	Low										ļ	
															,	
															'	
			Area Displaced	0.15	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.00	Moderate	Area Displaced	0.04	Moderate	1.23	Total Moderate
			Area Displaced	0.15	LOW	Area Displaced	0.00	LOW	Area Displaced	0.04	LOW	Area Displaced	0.00	LOW	0.52	Total Low
			Total Area Displaced	0.02	2	Total Area Displaced	0.05	5	Total Area Displaced	0.00	None	Total Area Displaced	0.1	5	3.46	Total Area
Populations/ Species	Impacts to Species at Risk	Species name, type and significance	Provincially Rare Specimens/Colonies	25	5 High	Provincially Rare Specimens/Colonies	43	3 High	Provincially Rare Specimens/Colonies	3	High	Provincially Rare Specimens/Colonies	82	2 High	1590	Total Provincially Rare
Surface Water	Changes in surface water conditions	area of surface drainage altered by each														
	(quality and quantity)	number of surface water														
		number of														
		degree of compliance													í′	
		with Provincial and													1 '	
		Federal Water Quality													<u> </u>	
Groundwater	Change in	area of infiltration zones													'	
	groundwater	area of groundwater													<u> </u>	
	and quantity)	areas of seepage													<b>↓</b> '	
		area of water table affected by each														
		proximity of alternative to public and private														
Other Natural	Impacts to mineral,	Area in ha within ROW	1			1	1						1			
Resources	petroleum, granular (quarry)															
Factor Orm	ianus/easements														<u> </u>	
Factor Summary:				1	1		1	1		1	1			1		
1 40101 00016.			1	1	1	1	1	1	1	1		1	1	1	1 '	































