

Regional Municipality of York

Appendix 4C-2

Terrestrial Environment

Field Investigations

Prepared by:

AECOM

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60114489

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Table of Contents

	page
1. Purpose of the Field Investigations Report.....	1
2. Study Area for the Field Investigations	1
3. Methodology for Field Investigations	3
4. Results of Field Investigations	3
4.1 Major Mackenzie Drive West	3
4.1.1 Designated Natural Areas	3
4.1.2 Vegetation Communities	4
4.1.3 Rare Species or Endangered Species	5
4.2 Rutherford Road.....	5
4.2.1 Designated Natural Areas	5
4.2.2 Vegetation Communities	6
4.2.3 Rare Species or Endangered Species	7
4.3 Highway 27.....	7
4.3.1 Designated Natural Areas	7
4.3.2 Vegetation Communities	7
4.3.3 Rare Species or Endangered Species	8
4.4 Weston Road.....	8
4.4.1 Designated Natural Areas	8
4.4.2 Vegetation Communities	9
4.4.3 Rare Species or Endangered Species	9
4.5 Highway 50.....	9
4.5.1 Designated Natural Areas	10
4.5.2 Vegetation Communities	10
4.5.3 Rare Species or Endangered Species	10
4.6 Pine Valley Drive	11
4.6.1 Designated Natural Areas	11
4.6.2 Vegetation Communities	11
4.6.3 Rare Species or Endangered Species	11
5. Summary	12

List of Figures

Figure 1. Western Vaughan Transportation Improvements IEA Study Area	2
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1. Purpose of the Field Investigations Report

This report documents the results of field investigations of the natural environment and hydrogeological features conducted for the Western Vaughan Transportation Improvements Individual Environmental Assessment (IEA). These investigations focused on the proposed road and transit improvements associated with the preferred Alternative to the Undertaking, Alternative 8. Investigations were also completed for the following disciplines:

- Built Heritage;
- Archaeology; and,
- Socio-Economics.

The results of these investigations will be used as part of the net effects analysis and comparative evaluation of the Alternative Methods of Carrying out the Undertaking.

2. Study Area for the Field Investigations

In accordance with the approved Terms of Reference (ToR), the Study Area for the IEA includes the western portion of the City of Vaughan from Highway 400 to the east, Highway 50 in the west, Steeles Avenue to the south and Teston Road to the north (see **Figure 1**). As mentioned in the ToR, the Study Area was reviewed following the identification of a preferred Alternative to the Undertaking.

The Study Area for the field investigations has been scoped to reflect the improvements associated with Alternative 8, the preferred Alternative to the Undertaking. Nine Alternatives to the Undertaking were evaluated based on a comprehensive list of factors and criteria, indicators and measures, completed as part of the IEA methodology. Alternative 8 was the most preferred based on the results of the evaluation and feedback from the public, as well as analysis of the Study Area environment (natural, social, built, and cultural environment), technical and financial factors.

Alternative 8 is comprised of a series of road and transit improvements, which include:

- Widening Major Mackenzie Drive to 6 lanes, from Highway 400 to Highway 50;
- Widening Rutherford Road to 6 lanes, from Weston Road to Highway 50;
- Widening Highway 27 to 6 lanes from Major Mackenzie Drive West to Steeles Avenue;
- Widening Highway 27 to four lanes, from Major Mackenzie Drive West to Teston Road;
- Widening Weston Road to 6 lanes including HOV lanes, from Major Mackenzie Drive West to Steeles Avenue;
- Widening Pine Valley Drive (North) to four lanes, from Teston Road to Major Mackenzie Drive;
- Widening Pine Valley Drive (South) to six lanes including HOV lanes, from south of Hwy. 7 to Steeles; and
- Widening Highway 50 (north) by six lanes, from Major Mackenzie Drive West to Rutherford Road; and south will be widened to 6 lanes.

For each of these improvements, the study team identified a 30-metre buffer that extended on either side of the existing road's centre line. The only exception was along Major Mackenzie Drive in the vicinity of Highway 27, where the proposed improvement includes elimination of the jog at this particular intersection. At this location, a wider buffer was identified. These buffers define the extent of the Study Area for field investigations, as shown in **Figure 1**.

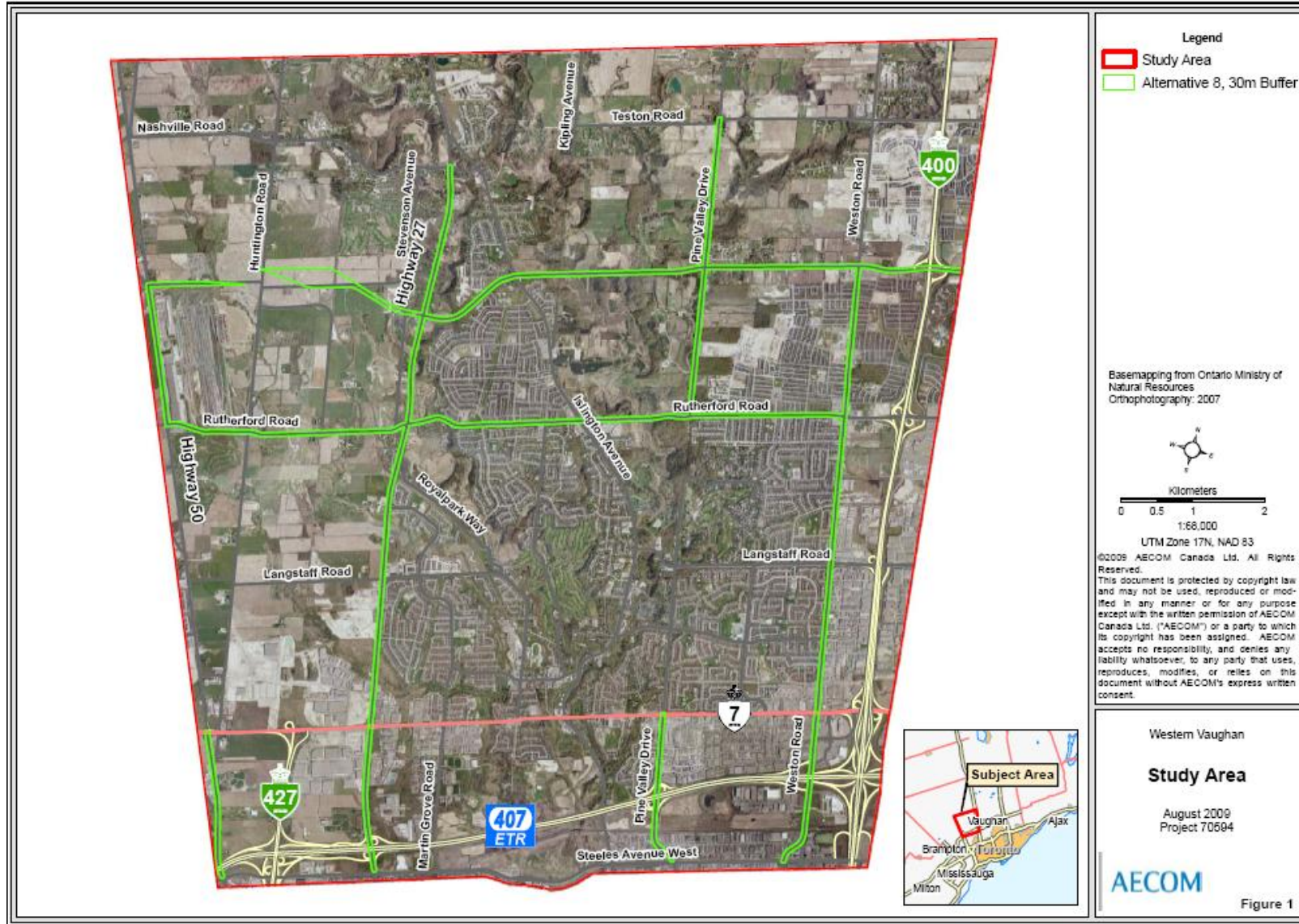


Figure 1. Western Vaughan Transportation Improvements IEA Study Area

3. Methodology for Field Investigations

Project study teams, consisting of terrestrial ecologists, were sent out to conduct a context analysis/field investigation of the Natural Environment features within the refined Study Area (within 30 m of the centre line of the road alignments in addition to areas where a temporary railway track diversion is required).

2007 Ortho photographs were interpreted to derive a preliminary delineation of vegetation communities and their relation to terrain and human disturbance conditions. AECOM terrestrial ecologists conducted plant community inventories in September 2009. The vegetation communities were classified according to the standardized method of Ecological Land Classification (ELC; Lee *et al.* 2008). This system of classification is a province wide approach that standardizes classifications based on broad community types and dominant species associations. Vegetation communities accessible to the field team were classified to the finest level of vegetation type, where possible. Where access was not possible, communities were classified to the finest level of ecosite/vegetation site possible.

Field visits were conducted for breeding birds in June 2009, for amphibians in April and June of 2009, and for vegetation in September/October 2009 and again in March 2010 for areas requiring track diversion. The seasonality of vegetation visits documents communities but does not provide a complete flora.

According to the Natural Heritage Information Centre (NHIC), none of the communities identified are listed as rare within the province of Ontario.

4. Results of Field Investigations

Field investigations are summarized within the following sub-sections based on the proposed road improvements. A plant list of species encountered during field investigations found 154 species of which 51 were non native or 33%.

4.1 Major Mackenzie Drive West

The Study Area for this road lies between Highway 50 to the west and Highway 400 to the east.

4.1.1 Designated Natural Areas

Provincially Significant Wetlands

Wetlands are evaluated by the Ontario Ministry of Natural Resources (OMNR) according to the Ontario Wetland Evaluation System (1994), in which the importance of a wetland is determined based on biological, social, hydrological and special features. Evaluated wetlands are categorized as either provincially or locally significant. These designations protect wetlands from development and alteration according to the Provincial Policy Statement (PPS) (2005).

While there are no official Provincially Significant Wetlands (PSWs) within 30 m of the centre line, there are a couple wetlands which have been labelled "Draft PSW" as part of the "Humber Wetland Complex," currently under review by the OMNR.

Areas of Natural and Scientific Interest

An Area of Natural and Scientific Interest (ANSI) is defined by the OMNR as an area that contains natural features that are provincially or regionally significant (NHIC). Earth Science ANSIs contain important geological features, and Life Science ANSIs contain representative ecological features. ANSIs are considered to be the best representation of a natural area within each site district and can be considered ecological benchmarks. Provincially designated ANSIs are protected from development under the PPS.

Several sections of a Provincially Significant Life Science ANSI within 30 m of the centre line are crossed, both north and south of Major Mackenzie Drive (between Islington Avenue and Pine Valley Drive) as well as just east of Pine Valley Drive.

Environmentally Sensitive Areas

An area that has ecological significance may be identified as an Environmentally Significant Area (ESA) and designated for protection by a municipality or Conservation Authority.

Two ESAs are crossed within 30 m of the centre line along Major Mackenzie Drive between Islington and Pine Valley.

4.1.2 Vegetation Communities

Natural vegetation cover along Major Mackenzie Drive is generally concentrated between Islington Avenue and Pine Valley Drive. A significant portion of the land area west of Highway 27 is active agriculture and also houses a large train depot. Natural vegetation occurs along the Humber River (just west of Highway 27); while east of Pine Valley Drive is highly urbanized. There are a number of wetlands within 30 m of the centre line, many of which are as a result of local landforms and drainage. The most common communities (in no particular order) found within the Study Area are summarized as follows:

- **Open Agriculture (OAG)**
Agricultural lands account for the majority of polygons west of Highway 27.
- **Fresh – Moist Willow Lowland Deciduous Forest Type (FODM7-3)**
Crack Willow (*Salix fragilis*) dominant forest units, with a sparse understorey.
- **Coniferous Plantation (TAGM1)**
These treed communities are human created and managed. They offer minimal ecological value and poor species and structural diversity. They are generally composed of Red Pine (*Pinus resinosa*) or Scots Pine (*Pinus sylvestris*).
- **Deciduous Woodland (WOD)**
These woodlands are defined as an area with a relatively recent history of human disturbance, with tree canopy cover between 35 and 60%. The woodlands found are low in quality, and have a sparse understorey. They are typically comprised of Crack Willow, Manitoba Maple (*Acer negundo*), White Ash (*Fraxinus americana*) and White Elm (*Ulmus americana*).
- **Mixed Meadow (MEM)**
Old field habitats account for a large portion of the Study Area. Dominant species include: Smooth Brome (*Bromus inermis*), Sweet White Clover (*Mellilotus alba*), Queen Anne's Lace (*Daucus carota*), Bird's foot-trefoil (*Lotus coniculatus*), Canada thistle (*Cirsium arvensis*), Common Milkweed (*Asclepias syriaca*) and various Goldenrod (*Solidago*) species. All dominant species are non-native except the Goldenrod and Common Milkweed.

- **Dry – Fresh White Pine – Sugar Maple Mixed Forest Type (FOMM2-2)**
These forests are mid-aged and are typically higher in quality than most other forests in the study. They are dominated either alone or in combination by White Pine (*Pinus strobus*) or Sugar Maple (*Acer saccharum*).
- **Dry – Fresh Sugar Maple – Hemlock Mixed Forest Type (FOMM3-2)**
This high quality, mixed deciduous and coniferous forest community is mid-aged to mature. The dominant species include Sugar Maple and Eastern Hemlock (*Tsuga canadensis*). This feature is found in the western portion of the alignment (west of Highway 27) along the Humber River.
- **Constructed Green Lands (CGL)**
These ELC polygons are defined as areas where greenspace has been constructed and are typically maintained by human influence. These areas include manicured lawns, planted street trees, parks, picnic areas, golf courses and common gardens for example. These units are primarily found west of Pine Valley Drive.
- **Cattail Graminoid Mineral Meadow Marsh Type (MAMM1-2)**
This low feature supports near-homogeneous stands of the non-native Narrow-leaved Cattail (*Typha angustifolia*). Narrow-leaved Cattail is a salt tolerant species and is generally found in urban environments where road salt application is common.

4.1.3 Rare Species or Endangered Species

Field investigations found three regionally rare plant species including Black Maple (*Acer nigrum*), Long-beaked Sedge (*Carex sprengelii*), and Hairy-beard Tongue (*Penstemon hirsutus*). There were several occurrences of area sensitive bird species, including the Bobolink, which has been provincially and federally designated as Threatened. Male Bobolinks were noted at two locations on the north side of Major Mackenzie Drive approximately 900 metres east of Islington Avenue and in another field approximately 500 metres further east. The birds use the portion of the field further back from the road that is removed from traffic noise. A narrow coniferous plantation provides a buffer between the traffic along Major Mackenzie Drive and the Bobolinks found within the field located further east of Islington Avenue.

No rare frog species were recorded during amphibian surveys.

4.2 Rutherford Road

The Study Area for this road lies between Highway 50 to the west and Weston Road to the east.

4.2.1 Designated Natural Areas

Provincially Significant Wetlands

While there are no official PSWs within 30 m of the centre line, there are a couple of wetlands which have been labelled “Draft PSW” as part of the “Humber Wetland Complex,” currently under review by the OMNR.

Areas of Natural and Scientific Interest

One section of a Provincially Significant Life Science ANSI within 30 m of the centre line is crossed north of Rutherford Road (between Islington Avenue and Pine Valley Drive). Two sections of a Provincially

Significant Earth Science ANSI are crossed, one section just west of Pine Valley Drive and the other east of Pine Valley Drive

Environmentally Sensitive Areas

Three ESAs are crossed within 30 m of the centre line, between Islington Avenue and just east of Pine Valley Drive. One further ESA is crossed just east of Highway 27.

4.2.2 Vegetation Communities

Natural vegetation cover along Rutherford Road is generally concentrated between Islington Avenue and Pine Valley Drive. A significant portion of the land area west of Highway 27 is active agriculture and is undergoing further urbanization. East of Pine Valley Drive is highly urbanized. There are a number of wetlands within 30 m of the centre line, many of which have resulted from local landforms and drainage. The most common communities (in no particular order) found within the Study Area are summarized as follows:

- **Open Agriculture (OAG)**
Agricultural lands account for the majority of polygons west of Highway 27.
- **Fresh – Moist Willow Lowland Deciduous Forest Type (FODM7-3)**
Crack Willow dominant forest units, with a sparse understorey.
- **Coniferous Plantation (TAGM1)**
These treed communities are human created and managed. They offer minimal ecological value and poor species and structural diversity. They are generally composed of Red Pine or Scots Pine.
- **Deciduous Woodland (WOD)**
These woodlands are defined as an area with a relatively recent history of human disturbance, with tree canopy cover between 35 and 60%. The woodlands found are low in quality, and have a sparse understorey. They are typically comprised of Crack Willow, Manitoba Maple, White Ash and White Elm.
- **Mixed Meadow (MEM)**
Old field habitats account for a large portion of the Study Area. Dominant species include: Smooth Brome, Sweet White Clover, Queen Anne's Lace, Bird's foot-trefoil, Canada thistle, Common Milkweed and various Goldenrod (Solidago) species. All dominant species are non-native except the Goldenrod and Common Milkweed.
- **Dry – Fresh White Pine – Sugar Maple Mixed Forest Type (FOMM2-2)**
These forests are mature and are typically higher in quality than most other forests in the study. They are dominated primarily by White Pine with Sugar Maple as an associate.
- **Constructed Green Lands (CGL)**
These ELC polygons are defined as areas where greenspace has been constructed and are typically maintained by human influence. These areas include manicured lawns, planted street trees, parks, picnic areas, golf courses and common gardens for example. These units are primarily found west of Pine Valley Drive.
- **Cattail Graminoid Mineral Meadow Marsh Type (MAMM1-2)**
This low feature supports near-homogeneous stands of the non-native Narrow-leaved Cattail.

- **Common Reed Graminoid Mineral Meadow Marsh Type (MAMM1-12)**
This is a very low quality wetland feature typical of urban environments. Common Reed (*Phragmites australis*) is non-native and salt tolerant and is generally found in urban environments where road salt application is common.
- **Deciduous Thicket (THD)**
Dominant plants included Hawthorn (*Crataegus*) species, Smooth Brome and Common Milkweed and are considered low quality.

4.2.3 Rare Species or Endangered Species

Field investigations found no rare plant species. There were several occurrences of area sensitive bird species located west of Pine Valley Drive. No rare frog species were recorded during amphibian surveys.

4.3 Highway 27

The study are for this road lies between Nashville Road to the north and Steeles Avenue to the south.

4.3.1 Designated Natural Areas

Provincially Significant Wetlands

There are no PSWs located within 30 m of the centre line.

Areas of Natural and Scientific Interest

There are no Provincially Significant ANSIs located within 30 m of the centre line.

Environmentally Sensitive Areas

One ESA is crossed along Highway 27 just south of Rutherford Road.

4.3.2 Vegetation Communities

Natural vegetation cover along Highway 27 is concentrated between Rutherford Road and Nashville Road. The majority of land south of Rutherford Road is highly urbanized and natural vegetation cover is limited. Higher quality wetland features are primarily found north of Major Mackenzie Drive, while lower quality wetlands are found throughout the Study Area. The most common communities (in no particular order) found within the Study Area are summarized as follows:

- **Fresh – Moist Willow Lowland Deciduous Forest Type (FODM7-3)**
Crack Willow dominant forest units, with a sparse understorey.
- **Coniferous Plantation (TAGM1)**
These treed communities are human created and managed. They offer minimal ecological value and poor species and structural diversity. They are generally composed of Red Pine or Scots Pine.

- **Deciduous Woodland (WOD)**
These woodlands are defined as an area with a relatively recent history of human disturbance, with tree canopy cover between 35 and 60%. The woodlands found are low in quality, and have a sparse understorey. They are typically comprised of Manitoba Maple, White Ash and White Elm.
- **Mineral Deciduous Swamp Ecosite (SWDM4)**
The dominant species are typically Crack Willow or Green Ash (*Fraxinus pennsylvanica*).
- **Green Ash Mineral Deciduous Swamp Type (SWDM2-2)**
This lowland swamp is of fairly high quality and is dominated almost entirely by Green Ash, with White Elm as an associate.
- **Mixed Meadow (MEM)**
Old field habitats account for a large portion of the Study Area. Dominant species include: Smooth Brome, Sweet White Clover, Queen Anne 's lace, Bird's foot-trefoil, Canada thistle, Common Milkweed and various Goldenrod (*Solidago*) species. All dominant species are non-native except the Goldenrod and Common Milkweed.
- **Constructed Green Lands (CGL)**
These ELC polygons are defined as areas where greenspace has been constructed and is typically maintained by human influence. These areas include manicured lawns, planted street trees, parks, picnic areas, golf courses and common gardens for example. These units are primarily found west of Pine Valley Drive.
- **Cattail Graminoid Mineral Meadow Marsh Type (MAMM1-2)**
This low feature supports near-homogeneous stands of the non-native Narrow-leaved Cattail.
- **Common Reed Graminoid Mineral Meadow Marsh Type (MAMM1-12)**
This is a very low quality wetland feature typical of urban environments. Common Reed is non-native and salt tolerant and is generally found in urban environments where road salt application is common. These units are more typically found south of Rutherford Road and form dense monocultures.
- **Open Agriculture (OAG)**
Agricultural lands account for a small portion of the Study Area.

4.3.3 Rare Species or Endangered Species

Field investigations found no rare plant species. Breeding Bird surveys found no area sensitive species. No rare frog species were recorded during amphibian surveys.

4.4 Weston Road

The Study Area for this road lies between Major Mackenzie Drive to the north and Steeles Avenue to the south.

4.4.1 Designated Natural Areas

Provincially Significant Wetlands

There are no PSWs located within 30 m of the centre line.

Areas of Natural and Scientific Interest

There are no Provincially Significant ANSIs located within 30 m of the centre line.

Environmentally Sensitive Areas

There are no ESAs located within 30 m of the centre line.

4.4.2 Vegetation Communities

Natural vegetation cover along Highway 27 is concentrated between Rutherford Road and Nashville Road. The majority of land south of Rutherford Road is highly urbanized and natural vegetation cover is limited. Higher quality wetland features are primarily found north of Major Mackenzie Drive, while lower quality wetlands are found throughout the Study Area. The most common communities (in no particular order) found within the Study Area are summarized as follows:

- **Deciduous Woodland (WOD)**
These woodlands are defined as an area with a relatively recent history of human disturbance, with tree canopy cover between 35 and 60%. The woodlands found are low in quality, and have a sparse understorey. They are typically comprised of Manitoba Maple, White Ash and White Elm.
- **Mixed Meadow (MEM)**
Old field habitats account for a large portion of the Study Area. Dominant species include: Smooth Brome, Sweet White Clover, Queen Anne's Lace, Bird's foot-trefoil, Canada thistle, Common Milkweed and various Goldenrod (Solidago) species. All dominant species are non-native except the Goldenrod and Common Milkweed.
- **Constructed Green Lands (CGL)**
These ELC polygons are defined as areas where greenspace has been constructed and are typically maintained by human influence. These areas include manicured lawns, planted street trees, parks, picnic areas, golf courses and common gardens for example. These units are primarily found west of Pine Valley Drive.
- **Common Reed Graminoid Mineral Meadow Marsh Type (MAMM1-12)**
This is a very low quality wetland feature typical of urban environments. Common Reed is non-native and salt tolerant and is generally found in urban environments where road salt application is common. These units are more typically found south of Rutherford Road and form dense monocultures.

4.4.3 Rare Species or Endangered Species

Field investigations found no rare plant species. Breeding Bird surveys found no area sensitive species. No rare frog species were recorded during amphibian surveys.

4.5 Highway 50

The study are for this road lies between two separate areas. The first runs between Major Mackenzie and Rutherford Road; and the second between Highway 7 and Highway 407.

4.5.1 Designated Natural Areas

Provincially Significant Wetlands

There are no PSWs located within 30 m of the centre line.

Environmentally Sensitive Areas

There are no ESAs located within 30 m of the centre line.

4.5.2 Vegetation Communities

The majority of land south of Rutherford road is highly urbanized and natural vegetation cover is limited. Higher quality wetland features are primarily found north of Major Mackenzie, while lower quality wetlands are found throughout the Study Area. The most common communities (in no particular order) found within the Study Area are summarized as follows:

- **Deciduous Woodland (WOD)**

These woodlands are defined as an area with a relatively recent history of human disturbance, with tree canopy cover between 35 and 60%. The woodlands found are low in quality, and have a sparse understorey. They are typically comprised of Manitoba Maple, White Ash and White Elm.

- **Mixed Meadow (MEM)**

Old field habitats account for a large portion of the Study Area. Dominant species include: Smooth Brome, Sweet White Clover, Queen Anne's Lace, Bird's foot-trefoil, Canada thistle, Common Milkweed and various Goldenrod (Solidago) species. All dominant species are non-native except the Goldenrod and Common Milkweed.

- **Open Agriculture (OAG)**

Agricultural lands account for the majority of polygons within the northern segment of Highway 50.

- **Constructed Green Lands (CGL)**

These ELC polygons are defined as areas where greenspace has been constructed and are typically maintained by human influence. These areas include manicured lawns, planted street trees, parks, picnic areas, golf courses and common gardens for example. These units are primarily found west of Pine Valley Drive.

- **Common Reed Graminoid Mineral Meadow Marsh Type (MAMM1-12)**

This is a very low quality wetland feature typical of urban environments. Common Reed is non-native and salt tolerant and is generally found in urban environments where road salt application is common. These units are typically found throughout Highway 50 in drainage ditches along the road.

4.5.3 Rare Species or Endangered Species

Field investigations found no rare plant species. Breeding Bird surveys found no area sensitive species. No rare frog species were recorded during amphibian surveys.

4.6 Pine Valley Drive

The study area for this road lies between Highway 7 to the north and Steeles Avenue to the south.

4.6.1 Designated Natural Areas

Provincially Significant Wetlands

There are no PSWs located within 30 m of the centre line.

Areas of Natural and Scientific Interest

There are no Provincially Significant ANSIs located within 30 m of the centre line.

Environmentally Sensitive Areas

There are no ESAs located within 30 m of the centre line.

4.6.2 Vegetation Communities

Natural vegetation cover along Pine Valley Drive is very limited. The land located south of Highway 7 is highly urbanized. Only one small wetland unit was found, and was comprised of non-native vegetation. The most common communities (in no particular order) found within the Study Area are summarized as follows:

- **Constructed Green Lands (CGL)**
These ELC polygons are defined as areas where greenspace has been constructed and is typically maintained by human influence. These areas include manicured lawns, planted street trees, parks, picnic areas, golf courses and common gardens for example. These units are composed of manicured lawn and street trees.
- **Mixed Meadow (MEM)**
Old field habitats account for a large portion of the Study Area. Dominant species include: Smooth Brome, Sweet White Clover, Queen Anne's Lace, Bird's foot-trefoil, Canada thistle, Common Milkweed and various Goldenrod (Solidago) species. All dominant species are non-native except the Goldenrod and Common Milkweed.
- **Deciduous Thicket (THD)**
Restricted mainly to the edges of the rail road. Dominant species include: Common Buckthorn, Red osier dogwood, Gray goldenrod (Solidago nemoralis) as well as other Goldenrod species in various stages of succession and regeneration. Most of the dominant species are non-native except Goldenrods and Gray dogwood.

4.6.3 Rare Species or Endangered Species

Field investigations found no rare plant species. Breeding Bird surveys found no area sensitive species. No rare frog species were recorded during amphibian surveys.

5. Summary

Natural vegetation cover is limited to several specific locations within the Study Area. These are centrally located, along Major Mackenzie Drive and Rutherford Road, as well as along the Humber River (adjacent to Highway 27). While these areas have significantly more vegetation than other locations within the Study Area, many are of poor quality and are heavily impacted by human activity. The remainder of the Study Area contains a mixture of active agricultural lands, abandoned fields converting into old fields and constructed greenspace, which offers minimal ecological value. The majority of wetlands found within the Study Area are of poor quality and typically dominated by non-native vegetation containing halophyte species adapted to high salt content areas, likely due to road salt application.

Only a few regionally rare species were found along Major Mackenzie Drive and Rutherford Road, with a few area sensitive bird species also encountered in the same vicinity. No rare frog species were identified within the Study Area. These findings are not unexpected due to the generally highly urbanized structure of the study environment.