

## **6.6 Vegetation**

### **6.6.1 Methods: Ecological Land Classification**

Field data collection was undertaken in order to classify and map ecological communities (including wetlands) to the vegetation level. Vegetation was characterized along the road alignment using the Ecological Land Classification System for Southern Ontario (Lee et al., 1998) on June 2-5<sup>th</sup> and reviewed again on July 15<sup>th</sup> 2009 to record mid-summer emerging plant species. This survey was done using the Ontario Ministry of Natural Resources updated classification developed in early 2007 (Community Codes Updated in 2008). These new ELC codes have been used for reporting purposes here as they are more representative of the vegetation communities within the study area. It may be expected that this method will be applicable to the lands under future development.

Communities surveyed were generally those found within 100 m of the TFD centre-line, but also included significant natural heritage features located within 200 m of the centre-line. Vegetation community boundaries (including wetlands) were determined through the review of aerial photography, and then further refined through on site soil and vegetation studies. Soil investigations were completed in order to gain a better understanding of ecological conditions on site. Soil studies involved the examination of a 120 cm soil profile dug using a hand auger. This allows for the description of soil texture and site moisture characteristics, which influence plant distributions and result in the observed vegetation assemblage. Other physical traits such as topography and slope aspect were also noted within each community. Vegetation studies involved identifying the dominant species in each vegetation cover type based on visual estimates of species abundances and biomass, or, in the case of accessible forest stands, by quantitative sampling using a factor 2 wedge prism.

The Ecological Land Classification (ELC) system recommends that a vegetation community be a minimum of 0.5 ha in size before it is defined. Patches of vegetation less than 0.5 ha or disturbed/planted vegetation were described to the community level only. In some instances, where vegetation is less than 0.5 ha, but appears relatively undisturbed and clearly fits within an ELC vegetation type, the more refined classification was used.

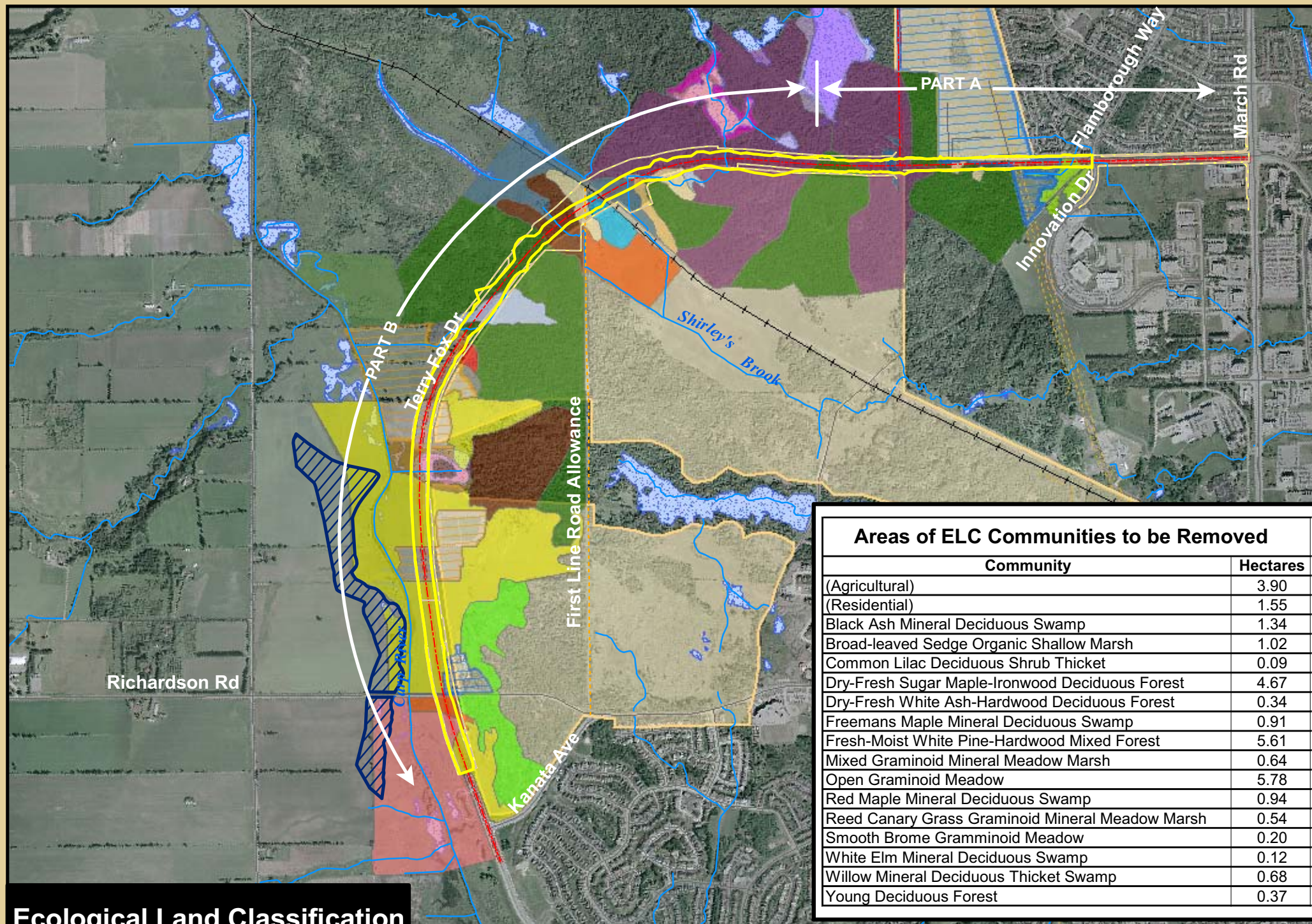
Vegetation communities were mapped on aerial photography according to ELC nomenclature to graphically represent the specific spatial pattern in the vegetation cover according to species composition, physiognomy, and physical site characteristics (**Figure 6**).

### **6.6.2 Methods: Botanical Surveys**

Botanical surveys were conducted May 5-6, 2009, June 3-5, 2009 and on July 15, 2009. Surveys consisted of wandering transects along the alignment centerline to determine species presence within the study area. This approach limited the possibility that potentially significant species would be missed. Species were recorded as they were encountered within each vegetation community. Nomenclature is based on the Ontario Plant List (Newmaster *et al*, 1998).

# Terry Fox Drive Road Corridor Canadian Environmental Assessment Screening Part A & B Summary

Figure 6: Ecological Land Classification

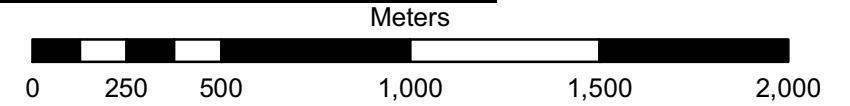


Areas of ELC Communities to be Removed	
Community	Hectares
(Agricultural)	3.90
(Residential)	1.55
Black Ash Mineral Deciduous Swamp	1.34
Broad-leaved Sedge Organic Shallow Marsh	1.02
Common Lilac Deciduous Shrub Thicket	0.09
Dry-Fresh Sugar Maple-Ironwood Deciduous Forest	4.67
Dry-Fresh White Ash-Hardwood Deciduous Forest	0.34
Freemans Maple Mineral Deciduous Swamp	0.91
Fresh-Moist White Pine-Hardwood Mixed Forest	5.61
Mixed Graminoid Mineral Meadow Marsh	0.64
Open Graminoid Meadow	5.78
Red Maple Mineral Deciduous Swamp	0.94
Reed Canary Grass Graminoid Mineral Meadow Marsh	0.54
Smooth Brome Graminoid Meadow	0.20
White Elm Mineral Deciduous Swamp	0.12
Willow Mineral Deciduous Thicket Swamp	0.68
Young Deciduous Forest	0.37

### Legend

- Grading Limit Footprint
- TFD Right of Way
- Road Centreline
- Railway
- Hydro Lines
- Wetland
- Floodplain Cut Area
- Watercourse
- Future Land Development

1:20,000  
Projection: UTM NAD83, Zone 18



Project Name: Terry Fox Drive EA  
 Map Created By: BC  
 Map Checked By: AZ/SFG  
 Date Created: July 16, 2009  
 Date Modified: April 1, 2010  
 File Name: I:\GIS\091518 - Terry Fox Drive Final  
 Design\Mapping\Part B Figures - CEAA 113009/  
 Figure 6 Ecological Land Classification.mxd

## Ecological Land Classification

(Agricultural)	Dry-Fresh Sugar Maple-Ironwood Deciduous Forest	Fresh-Moist Manitoba Maple Deciduous Woodland	Open Graminoid Meadow	White Elm Mineral Deciduous Swamp
(Residential)	Dry-Fresh White Ash-Hardwood Deciduous Forest	Fresh-Moist White Pine-Hardwood Mixed Forest	Reed Canary Grass Graminoid Mineral Meadow Marsh	Willow Mineral Deciduous Thicket Swamp
Black Ash Mineral Deciduous Swamp	Freemans Maple Mineral Deciduous Swamp	Hawthorn Deciduous Shrub Thicket	Red Maple Mineral Deciduous Swamp	Young Deciduous Forest
Broad-leaved Sedge Organic Shallow Marsh	Fresh-Moist Burr Oak Deciduous Forest	Mixed Graminoid Mineral Meadow Marsh	Smooth Brome Graminoid Meadow	
Cattail Mineral Shallow Marsh	Fresh-Moist Elm-Mixwood Deciduous Woodland	Non-native Mineral Deciduous Swamp	Speckled Alder Mineral Deciduous Thicket Swamp	
Common Lilac Deciduous Shrub Thicket				

### 6.6.3 Current Baseline Conditions

#### 6.6.3.1 Results of Ecological Land Classification

The type of vegetation in the study area has been well documented through the Natural Environment Systems Strategy (NESS) for the former Region of Ottawa-Carleton (Brunton, 1992), in the Shirley's Brook/ Watts Creek Sub-watershed Plan (Dillon Consulting, 1999) and other local naturalist reports. Most of the existing natural areas (i.e. planned for development for urban or other uses) are northeast of the Carp Ridge running west from Richardson Side Road. The remaining sections of the study area are primarily urban or agriculture with minimal natural environment features.

A total of 22 different vegetation communities were observed in the TFD study area with 5 of these communities observed as distinct inclusions or complexes within the larger communities. None of the vegetation communities observed in the study area are considered rare or of concern in Ontario, however some of the individual flora specimens are listed species at risk. Species at Risk have been deleted from the table for maintaining confidentiality. The following **Table 6-8** outlines the communities documented during the 2009 ELC surveys (**Figure 6**):

**Table 6-8 – Description of ELC Communities Documented in the Terry Fox Drive Study Area**

ELC Code	Classification	Soils/ Hydrology	Vegetation	Comments
FODM4-2	<b>Dry-Fresh White Ash-Hardwood Deciduous Forest</b>	Sandy clay loam; 3 moisture regime	This community contains a diversity of canopy trees including bur oak, white ash, ironwood, butternut and black cherry. The understory contains choke cherry, narrow-leaved meadowsweet, beaked hazel and glossy buckthorn. The ground layer includes yellow trout lily, Canada mayflower, wild strawberry and cow vetch.	
FODM5-4	<b>Dry-Fresh Sugar Maple-Ironwood Deciduous Forest</b>	Loamy fine sand; 3-4 moisture regime	This community contains a good diversity of tree species including 50% sugar maple with ironwood, basswood, white pine, white ash, bitternut hickory and American beech. The understory contains choke cherry and alternate-leaved dogwood, while the ground layer is characterized by Canada violet, ostrich fern, blue cohosh, toothwort and sharp-lobed hepatica.	Note: This community dominates much of the upland areas along the alignment.
FODM9-3	<b>Fresh-Moist Bur Oak Deciduous Forest</b>	Silty clay; 3 moisture regime	This community is characterized by mature bur oak trees with an understory of ironwood, black cherry and white ash associates. Ground layer contains cleavers, yellow violet and enchanter's nightshade.	Small vegetation community on the edge of agricultural areas.
FOMM9-2 (MEGM3-5) (SWTM1-1)	<b>Fresh-Moist White Pine-Hardwood Mixed Forest</b> (Inclusion: Smooth Brome Graminoid Meadow (Inclusion: Speckled Alder Mineral Deciduous Swamp)	Sandy loam; 5 moisture regime	This mixed forest community has large mature white pines with hardwood associates in the canopy. Common associates include ironwood, basswood, white ash and sugar maple. The understory consists of a variety of hardwood and conifer species. Wild strawberry, ostrich fern, false nettle, enchanter's nightshade, rough bedstraw and Virginia creeper are common groundcover. Smooth brome graminoid and speckled alder deciduous swamp community inclusions are present in this mixed forest.	Note: This community dominates large portions of the upland areas in the northeastern section of the alignment.

ELC Code	Classification	Soils/ Hydrology	Vegetation	Comments
WODM5-2	<b>Fresh-Moist Elm-Mixwood Deciduous Woodland</b>	Silty very fine sand over bedrock; 3- 4 moisture regime	This woodland community has sparse to good coverage of white elm, bur oak, red oak, ironwood and white ash. The groundcover is sparse to full of herbaceous drought tolerant species.	This community is associated with rocky outcrop areas east of the alignment in the southern portion of the study area.
WODM5-3	<b>Fresh-Moist Manitoba Maple Deciduous Woodland</b>	Silty clay, 6 Moisture Regime.	This community is open woodland with Manitoba maple being the most common species. A small number of large balsam poplar are also present as well as staghorn sumac. Canada thistle, canary reed grass and Canada goldenrod are common herbaceous species.	This small community is located approximately 200 meters west of the 2 <sup>nd</sup> line alignment and almost 800 meters north of the TFD alignment.
THDM2-13	<b>Common Lilac Deciduous Shrub Thicket</b>	Shallow layer of mineral soil over bedrock; unknown moisture regime	A dense cultural thicket comprised of common lilac shrubs on rocky slope east of the alignment. Bedrock expose or below shallow soil layer.	Adjacent to white ash-hardwood deciduous forest community. Old farm house foundation observed in the vicinity of this community.
THDM2-11	<b>Hawthorn Deciduous Shrub Thicket</b>	No soil data.	This community is old field and overgrown pasture, with the dominant vegetation form being hawthorn shrubs.	This community is located at the northern extent of agricultural lands located north of Richardson Side Road.
	<b>Young Deciduous</b>	Disturbed soils along hydro corridor.	The young regenerating vegetation is likely Black Ash and other early successional species tolerant of disturbed soils.	
MAMM1-3 (MAMM1-16) (SWTM3-1)	<b>Reed Canary Grass Graminoid Mineral Meadow Marsh</b> (Complex: Mixed Graminoid Mineral Meadow Marsh) (Inclusion: Willow Mineral Deciduous Thicket Swamp)	Silty clay; 6 moisture regime. The water table is above or at substrate surface seasonally.	This meadow marsh community is dominant in reed canary grass and complexed with other graminoid meadow marsh species (e.g. soft stem bulrush, sedges) and hydrophilic herbaceous species (e.g. boneset, spotted Joe-pye-weed, jewelweed, etc.)	Meadow marsh vegetation communities are typical transition areas from wetland to upland communities.
MASM1-1	<b>Cattail Mineral Shallow Marsh</b> (Inclusion: Speckled Alder Mineral Deciduous Swamp)	Sandy Loam, 5 Moisture Regime. Water table is above soil, bedrock is close to soil surface perhaps accounting for poor drainage despite high sand content in soil.	Cattail dominated marsh with cyperus-like sedge common and occurrences of wild calla, fox sedge, bulbiferous water hemlock, blue vervain, water-shield and water plantain. The marsh is fringed by a speckled alder deciduous swamp community.	This large marsh is located approximately 130 meters west of the 2 <sup>nd</sup> line and 220 meters north of the TFD alignment in the northeast end of the study area.
MASO1-6 (SWTM5-8)	<b>Broad-leaved Sedge Organic Shallow Marsh</b> (Complex: Non-native Mineral Deciduous Thicket Swamp)	>30 cm Organic mesic peat on top of ; 6-7 moisture regime	This community is dominant in broad-leaved sedges such as lake sedge. Surrounding the sedge community is a complex of glossy buckthorn deciduous thicket swamp with speckled alder, narrow-leaved meadowsweet and gray dogwood associates.	Large wetland area within 100 metres of the road alignment.

ELC Code	Classification	Soils/ Hydrology	Vegetation	Comments
MEGM4-1	<b>Open Graminoid Meadow</b>	Silty very fine sand and silty clay; 4 moisture regime	This community is predominantly graminoid species with herbaceous groundcover associates. Typical species include reed canary grass, Kentucky bluegrass and other grasses mixed with common pasture flora.	Graminoid meadows occupy pasture areas adjacent to agricultural cropland. Moderate to heavy cultural influences.
SWDM2-1 (SWDM3-1)	<b>Black Ash Mineral Deciduous Swamp</b> (Inclusion: Red Maple Mineral Deciduous Swamp)	Fine sandy clay; 6 moisture regime. The water table is above or at substrate surface seasonally.	The canopy of this community is dominant in black ash, with abundant red maple and yellow birch. Other associates of this wetland type include white elm, eastern white cedar, and basswood. A red maple deciduous swamp inclusion is present in this community.	Black ash swamp communities range from small inclusions to >0.5ha units in depression areas within the expansive sugar maple-ironwood deciduous forest and a complex of the Freeman's maple swamp community. Ash swamps are typically associated with floodplain areas.
SWD3-3	<b>Freeman's Maple Mineral Deciduous Swamp</b>	Organic humic peat on top of clay mineral deposits; 6 moisture regime. The water table is above or at substrate surface seasonally.	This community is dominated by freeman maple and silver maple with occurrences of red maple, black ash, white elm and yellow birch. The understory contains sparse quantities of red elderberry, raspberry and glossy buckthorn. The ground layer contains an abundance of sensitive fern, stinging nettle, sedges and mosses.	This wetland community is inundated late into the growing season.
SWDM4-2	<b>White Elm Mineral Deciduous Swamp</b>	Silty clay; 6 moisture regime. The water table is above or at substrate surface seasonally.	Canopy is dominant in stunted white elm. The shrub understory contains narrow-leaved meadowsweet, sandbar willow and dotted hawthorn. A dense groundcover of mainly hydrophilic goldenrod species, reed canary grass, Kentucky bluegrass, etc.	This community marks a transition zone between the willow thicket swamp and the hardwood upland community.
SWTM3-1	<b>Willow Mineral Deciduous Thicket Swamp</b>	Silty clay; 6 moisture regime. The water table is above or at substrate surface seasonally.	A dense shrub thicket with hydrophilic flora dominant in sandbar willow. Other common associates include white elm, black ash, red-osier dogwood, narrow-leaved meadowsweet and glossy buckthorn. Groundcover has high abundance of sensitive fern.	This is the dominant community adjacent to the rail line in the vicinity of the proposed road right-of-way.

Vegetation communities were mapped on aerial photography according to ELC nomenclature to graphically represent the specific spatial pattern in the vegetation cover according to species composition, physiognomy, and physical site characteristics (**Figure 6**).

### 6.6.3.2 Botanical Survey Results

A complete list of plants observed, including the federal, provincial and conservation status of individual species is presented in **Appendix J**. In total, 218 flora species were identified within 100 m of the Terry Fox Drive Right of Way (ROW) the study area during the spring and early summer of 2009. Of these, 39 (17.9%) are listed as exotic or non-native species. A total of 54 (24.7%) of the species encountered have a coefficient of conservatism of 6 or greater. To put that into context, the coefficients of conservatism (CC) ranges from 0 to 10 and represents an estimated probability that a plant is likely to occur in the landscape in a relatively unaltered from what is believed to be a pre-settlement condition. For example, a CC of 0 is given to plants such as Manitoba maple (*Acer negundo*), which have demonstrated little fidelity to any remnant natural community, i.e. although native to the prairies, they may be found almost anywhere and may have ranged widely in pre-settlement periods due to their invasive nature. Conversely,

a CC of 9 is applied to plants like American ginseng that are almost always restricted to a pre-settlement remnant, i.e. a high quality, relatively undisturbed natural area. Introduced plants were not part of the pre-settlement flora, so no CC value is applied to these. Species normally observed in high quality habitats documented within the study area include American ginseng, water arum (*Calla palustris*), broad-leaved toothwort (*Cardamine diphylla*), brome-like sedge (*Carex bromoides*), silvery sedge (*Carex canescens*), Carolina spring beauty (*Claytonia caroliniana*) and brittle fern (*Cystopteris fragilis*).

Two of the plant species observed are listed federally and provincially as Endangered, the American ginseng and Butternut trees. American ginseng is also considered regionally significant within the City of Ottawa. Three individuals of American ginseng were located near Station [Confidential]. A Butternut Health assessment was conducted by a qualified assessor in September 2009 as discussed in **Chapter 9**. In total, 177 butternut individuals were marked by GPS at various spots on the proposed alignment and an additional 2 individuals around the Shirley's Brook realignment. The majority of butternut trees were concentrated between Stations 16+250 and 15+850 in Part A of the Terry Fox Drive Project. In addition, 3 more native plant species considered regionally significant, and 22 native plant species considered uncommon within the City of Ottawa, were observed during fieldwork. Refer to **Appendix J** for a full list of plant species observed in the study area by Dillon staff including potential significant species occurrences.

#### **6.6.4 Effects Assessment: Vegetation**

The Terry Fox Drive extension will affect several vegetation communities identified along the ROW alignment during the ELC surveys in 2009. The incremental impact to individual flora species, as a result of the roadway alone, includes the removal of two identified *Species at Risk* (SAR), butternut trees and American ginseng and the loss of regionally or locally *Rare* or *Uncommon* plants in the Study Area. The mandatory requirement under municipal, provincial and federal legislation and regulations for mitigation and/or compensation of impacts to vegetation resources is limited to provincially-listed species at risk and listed vegetation communities (i.e. alvar communities). No listed vegetation communities were identified within the study area.

##### **6.6.4.1 Impacts to Plants and Plant Communities**

The development of the Terry Fox Drive (Part B) extension as part of the future planned development will result in the incremental removal of natural vegetation communities identified during ELC surveys (**Figure 6**). The natural vegetation communities that will be predominantly affected by the road extension are the sugar maple-ironwood deciduous forest (4.67 ha) and white pine-hardwood mixed forest (5.61 ha). These forest vegetation community types are not significant or rare in Ontario; however, these communities are within the boundaries of the South March Highland ANSI. Further, provincially and locally significant plants were documented in these forests. Following is the analysis of the impacts and mitigation measures that will be utilized to reduce the impact of losing these communities from the natural heritage system.

As discussed above, wetland vegetation communities that will also be affected by the TFD extension include black ash (1.34 ha), red maple (0.94 ha) and Freeman's maple (0.91 ha) deciduous swamps, willow deciduous thicket swamp (0.68 ha), mixed graminoid mineral meadow marsh (0.64 ha) and broad-leaved sedge organic shallow marsh (1.02 ha). While these ELC wetland communities are not all provincially significant, some of the wetland areas are units of the South March Highland PSW Complex. Four units of the PSW are in close proximity to the road and parts will be directly removed or in-directly effected. The impacts to wetland vegetation communities as well as the mitigation strategies that will be employed to reduce or avoid these impacts are discussed below.

Mitigation and compensation for impacts to mixed forest, deciduous forest and wetland communities will focus on compensatory restoration of the Carp River floodplain (**Chapter 7**). Specifically as part of the floodplain compensation along the Carp River, restoration of 10 ha of productive farmland, 8.2 ha of swamp wetland and afforestation of 2.0 ha of abandoned farmland will be implemented.

#### **6.6.4.2 Botanical**

Vegetation removal in the TFD grading limit footprint will impact forest, wetland and open country botanical communities. The South March Highland ANSI and PSW units are home to several locally and regionally significant species as well as two federally and provincially listed at-risk plants, both *Endangered*: {Names and locations withheld at the request of the Ontario Ministry of Natural Resources}. **Chapter 9** of this document addresses in detail the specific species found, the potential and direct effects of the roadway and how mitigation will be applied to minimize the effects of the road construction on these sensitive populations.

Beyond the communities removed during the development of the road, there is also the potential for conversion of vegetation communities to negative edge-effects along the newly exposed communities outside of the roadway arc. Some edge effects include colonization of non-native or invasive species, wind blow-down, sunscald of shade tolerant species. Mitigation for the potential introduction of invasive species will be addressed through following the guidance provided in *A Strategic Plan for Managing Invasive Plants in Southern Ontario* (OIPWG, 2000). An Edge Management Plan (EMP) is a common tool for controlling undesirable edge effects at the interface between natural ecosystems and urban environments. The following is recommended for inclusion in the EMP:

#### **Construction Measures**

- On the landscape plans, specify native tree and dense shrub plantings along the forest edge:
  - Do include butternut tree saplings in the community mix;
  - Match the existing species mix as much as practical;
  - Maintain plantings of species at risk within same-species population groups to avoid contamination of the gene pool with inferior qualities;
- Avoid the use of unsterilized topsoil from areas with invasive species for fill or landscaping along the portion of the ROW within the boundaries of the South March Highlands or other natural features:
  - This is to avoid the importation of exotic species such as wild garlic, *Phragmites* or Scotch thistle; and,
- Keep construction equipment vehicles free of residual soil deposits that could carry non-native seeds into the area. Establish a truck-tire wash station at the entrances to the work site.

#### **Interim Measures**

- Conduct a post-construction survey of the ROW one year after construction to identify and recommend removal strategies for invasive species before they become firmly established.

#### **Long Term Measures**

- Monitor butternut health following the agreement with the MNR (**Chapter 9**)

### **6.6.5 Assessment of Significance: Vegetation**

**Table 6-9** provides a summary of the vegetation effects assessment.

**Table 6-9 – Summary of Effects on Vegetation**

Project Interaction	Potential Effects	Mitigative Factor and Measure	Significance Criteria	Assessment of Significance)
<b>Timing: Construction</b>				
Site Preparation	<ul style="list-style-type: none"> <li>Loss of natural vegetation communities</li> <li>Loss of SAR plants;</li> <li>Loss of regionally and locally significant plant species</li> </ul>	<ul style="list-style-type: none"> <li>Prepare edge management landscaping plans for implementation;</li> <li>Avoid importation of exotic plant species; use only native species in all landscaping and ecological restoration works;</li> <li>Provide follow up monitoring of vegetation and replace dead stock within two years of planting.</li> </ul>	<ul style="list-style-type: none"> <li>Nature of Effect – <i>Negative, direct</i></li> <li>Magnitude – <i>Medium</i></li> <li>Geographic Extent - <i>Local</i></li> <li>Duration – <i>Short-term</i></li> <li>Frequency - <i>Low</i></li> <li>Permanence – <i>Permanent</i></li> </ul> <p>Recovery expected to occur within 3 years of substantial completion.</p>	Not significant with mitigation and compensation.
Demobilization / Cleanup	<ul style="list-style-type: none"> <li>Edge effects</li> <li>Wind-throw of trees along edge.</li> </ul>	<ul style="list-style-type: none"> <li>Compensation through the creation of a 8.2 ha forested swamp constructed wetland on the Carp River floodplain.</li> <li>Afforest 2 ha of the Carp River floodplain to offset remainder of woodland losses.</li> </ul>		Not significant with restoration strategy and mitigation.
<b>Timing: Operations</b>				
Site disturbance associated with routine operations and maintenance	<ul style="list-style-type: none"> <li>Introduction of invasive species affecting community;</li> <li>Conversion from interior forest conditions to edge habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Invasive species management following OIPWG guidance and City environmental sustainability policy;</li> <li>Development of an Edge Management Plan for the interface between the road infrastructure and the adjacent natural lands.</li> </ul>	<ul style="list-style-type: none"> <li>Nature of Effect – <i>Negative, indirect</i></li> <li>Magnitude – <i>Low</i></li> <li>Geographic Extent – <i>Local</i></li> <li>Duration - <i>Long-term</i></li> <li>Frequency – <i>Periodic (medium)</i></li> <li>Permanence - <i>Permanent</i></li> </ul>	Not significant with mitigation.

## 6.7 Wildlife

### 6.7.1 Survey Methods

In general, wildlife such as reptiles and mammals were recorded through focused and incidental observations noted during all field investigations for the TFD alignment. **Figure 7** indicates the range and locations of the surveys during the spring and summer of 2009. The location and species of each observation was recorded along with a photograph, if possible, for inclusion into the report. Field