Natural Areas Inventory
Credit River Watershed & Region of Peel

Credit River Watershed and Region of Peel

Natural Areas Inventory - Volume 1

September 2011

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Toronto and Region Conservation for The Living City
Region of Peel Working for you
Halton/North Peel Naturalist Club
South Peel Naturalists' Club
CVC Credit Valley Conservation

ACKNOWLEDGEMENTS

Many people and organizations have contributed to this project.

The Credit River Watershed and Region of Peel Natural Areas Inventory Project is a partnership between Credit Valley Conservation (CVC), Toronto and Region Conservation Authority (TRCA), the City of Brampton, the Region of Peel, the Halton-North Peel Naturalists' Club (HNPNC) and the South Peel Naturalists' Club (SPNC). This partnership has been special as each partner has contributed in its own unique way, and all contributions are important and are appreciated. This project would not have been possible without the support and guidance of these groups, including the executive members and staff that stand behind them.

Over the years of this project, the members of the NAI Management Committee have contributed their time, expertise and perspective. The Management Committee members are as follows.

NAI Management Committee Members	Representing
Sue Hayes	TRCA
Susan Jorgenson	City of Brampton
Joyce Lechasseur	SPNC
Bill McIlveen	HNPNC
Bob Morris	CVC
Don Morrison	SPNC
Audrey Oswald	SPNC
Scott Sampson	CVC
Janet Wong	Region of Peel

The NAI Technical Steering Committee members have provided much-appreciated insights, advice and expertise, especially in guiding this project through a thoughtful planning process. The Technical Steering Committee members are as follows, in addition to the Management Committee members.

NAI Technical Steering Committee Members	Representing
Kim Barrett	Conservation Halton
Mark Head	Region of Peel
Mark Heaton	Ontario Ministry of Natural Resources
Natalie Iwanycki	Royal Botanical Gardens
Eva Kliwer	City of Mississauga
Rod Krick	CVC
Leilani Lee-Yates	Region of Peel (until 2010)
Deanna Lindblad	Conservation Niagara
Peter Lyons	City of Mississauga (until 2009)
Liam Marray	CVC
Bob Noble	West Humber Naturalists Club
John Pisapio	Ontario Ministry of Natural Resources
Dave Taylor	Mississauga Gardens Council
Bree Wilson	Conservation Niagara
Brenda Van Ryswyk	Conservation Halton

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NAI Municipalities Group Members	**Representing**
Warren Harris	Town of Halton Hills
Susan Mentis	CVC
Mirella Palermo	City of Brampton
Marsha Paley	Town of Caledon (until 2009)
Jason Scott	Region of Halton (until 2008)
Mary Shields	Town of Erin EAC
Sally Stull	Town of Erin

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Ontario Trillium Foundation
Fondation Trillium de l'Ontario

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Dawn Renfrew,
Credit River Watershed and Region of Peel Natural Areas Inventory Project Coordinator
Credit Valley Conservation
2011

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PART A BACKGROUND

1. INTRODUCTION

A Natural Areas Inventory (NAI) is an inventory of the biological resources of a natural area – it documents the species and ecological features that are present in an area. Natural Areas Inventories are designed to provide biological and ecological information that can be used to establish baseline conditions on natural heritage features and functions present at varying geographic scales, including at a project site, for an area or over a municipality or a watershed. A NAI will enable municipalities and agencies to identify the significance and ecological sensitivities of natural features and areas in accordance with municipal and provincial policy, such as significant woodlands, wetlands, wildlife habitat, fish habitat, and the habitat for threatened and endangered species. Natural Areas Inventories are conducted using standardized inventory protocols (e.g. Ecological Land Classification for Southern Ontario, Forest Breeding Bird Monitoring, and Amphibian Call Counts) that are scientifically defensible. Therefore this inventory will ensure consistent data collection across the entire study area which will improve the utility of the data in environmental management programs, including the review of planning applications, environmental and/or ecological assessments and monitoring programs.

Ecological information for natural areas and features may not exist, be out-of-date or scattered in a variety of places including studies by various government agencies, development applications, and staff files. Many of the core resources for natural heritage information, such as Environmentally Significant Area reports, wetland evaluations and Forest Resource Inventories, were generated between the late 1970's to mid-1980's and are now out-of-date. More current data may be available from studies such as recent updates to wetland evaluations, subwatershed studies, and inventories conducted in relation to planning and development applications. Often, these studies have been carried out using a variety of inventory protocols. Some of the data may be useable, some may be incomplete and some may be lacking in quality. The variable quality of this data makes it very difficult to analyze in a manner that provides meaningful interpretation to accurately characterize the ecological landscape on a broader scale. This NAI sets out to address these deficiencies in biological knowledge of natural areas in the Credit River watershed and the Region of Peel.

Municipalities in other areas have also identified issues with the lack of adequate and good quality environmental data. In response to this, Natural Areas Inventories were undertaken in Haldimand-Norfolk, 1985; Hamilton – Wentworth, 1990 & 2001; Halton Region, 2003; and Niagara Region, 2006. Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) have been conducting ongoing inventories of natural areas as part of their Natural Heritage Programs. The City of Mississauga developed a Natural Areas Survey (NAS) in 1995 and has maintained the NAS through annual surveys for the natural areas in each quadrant of the City on a four year rotation.

1.1. REPORT FORMAT - OVERVIEW

The Credit River Watershed and Region of Peel Natural Areas Inventory Report has three parts. Part A Background: describes the study area, physical and natural heritage context and methodology used to undertake fieldwork. Part B Site Summaries and References Cited: contains the site summaries for the natural areas covered, location maps of the natural areas summarized, and general concepts and terms to assist with reading site summaries. The site summaries contain the site-specific information collected for the natural areas inventoried. Also in Part B are general stewardship opportunities for landowners to consider. Appendix A contains descriptions of vegetation communities, listing plant species that are commonly encountered as community dominants, for each vegetation type found in the study area. Appendices B and C contain lists of all flora and fauna species (respectively) known to be present in natural areas of the NAI study area with the distribution of each species by Region/County given.

Site summaries presented here are designed to be self-contained, paginated according to site name. The report user may choose to order the summaries as desired. As well, site summaries produced in future NAI reports can also be inserted.

2. THE CREDIT RIVER WATERSHED AND REGION OF PEEL NATURAL AREAS INVENTORY PROJECT

The Region of Peel and the Credit River watershed are one of the fastest growing regions in Canada. Given the tremendous development pressures this area will be facing, it is essential that the existence and composition of natural areas in the region are known and their functions are understood. The Credit River Watershed and Region of Peel Natural Areas Inventory Project was initiated in 2007. The study area was defined to include the entire Credit River watershed and all of the Region of Peel, providing both watershed and municipal context for the data coverage.

The objective of the NAI project is to assemble existing information, identify basic data gaps and address the data gaps by documenting the existence and distribution of plant communities, and flora and fauna species in natural areas of the study area, that is accurate, up-to-date, easily accessible and in context. Ideally, inventory of all natural areas within the study area will be undertaken, although achieving this will take many years to complete due to the extensive area to cover. Information gathered by the NAI project can be used for land-use and natural heritage system planning, lands management, environmental monitoring, stewardship, restoration, and public education.

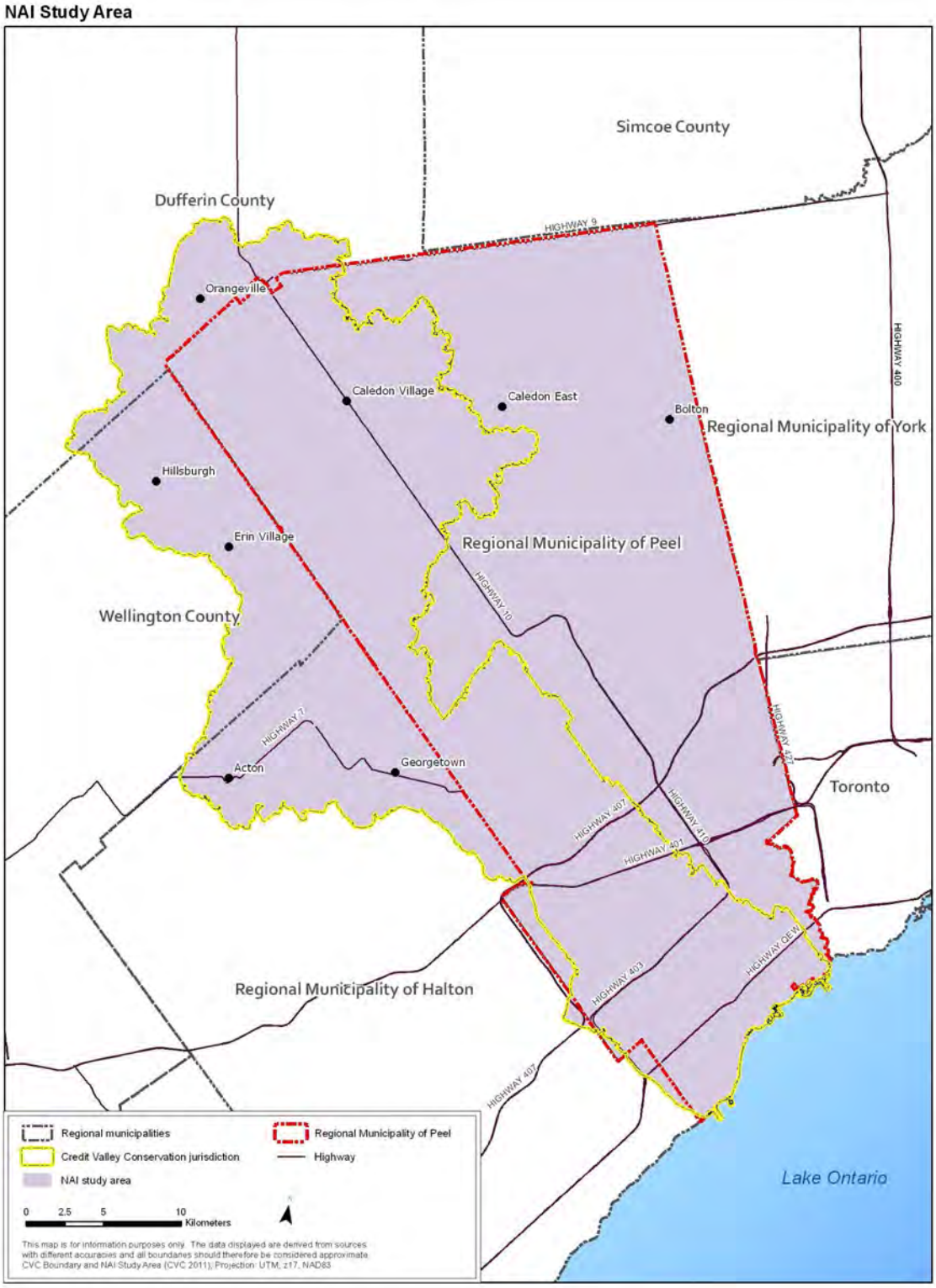
This NAI is a collaborative effort between Credit Valley Conservation (CVC), the Halton/North Peel Naturalist Club (HNPNC), the South Peel Naturalists' Club (SPNC), Toronto and Region Conservation Authority (TRCA), the Region of Peel and the City of Brampton. Credit Valley Conservation and the naturalist clubs jointly applied for, and received, a grant from the Ontario Trillium Foundation (OTF), which got the project started. All of the partners have made substantial contributions in various ways – providing financial support, providing data sets representing large inputs of field time, providing in kind contributions of facilities, expertise and manpower and providing assistance in meeting funding-related deliverables.

The NAI project is directed by a Management Committee consisting of representation from the project partners: CVC, TRCA, Region of Peel, City of Brampton, HNPNC and SPNC. The NAI Management Committee is responsible for all key decisions on NAI direction, staffing, financial matters and reporting.

The NAI project received technical guidance from a NAI Technical Steering Committee, composed of individuals or representatives of groups with expertise in biological inventory (OMNR, Royal Botanical Gardens), groups with experience with NAI projects in other jurisdictions (City of Mississauga, Conservation Halton, Conservation Niagara), a planning perspective (CVC Planner-Ecologist) and representatives of groups to help deliver public participation and education objectives (Mississauga Gardens Council, West Humber Naturalists Club). The Technical Steering Committee provided advice on technical/scientific matters primarily biological, mapping, development of field protocols and facilitated the delivery of public education and participation deliverables associated the OTF grant. A Municipalities Group, composed of one representative from each of the lower tier municipalities that fall in the study area plus a representative from the Region of Peel and a representative from the Management Committee was also convened on occasion to inform the municipalities on the project and to obtain feedback on municipal needs and interests with respect to the NAI.

While initially supported as a four-year project with two field seasons, the NAI has evolved into a natural heritage program for CVC, and in 2011 completed its fourth field season. The NAI has also served to initiate the Brampton NAI (BNAI) project, which conducts additional field work and data compilation for the City of Brampton. The BNAI data set is fully integrated with the NAI data set.

Figure 1


NAI Study Area
Simcoe County
Dufferin County
HIGHWAY 9
Orangeville
HIGHWAY 400
Caledon Village
Caledon East
Bolton
Regional Municipality of York
Hillsburgh
Erin Village
Regional Municipality of Peel
HIGHWAY 10
Wellington County
HIGHWAY 7
Acton
Georgetown
HIGHWAY 427
Toronto
HIGHWAY 407
HIGHWAY 410
HIGHWAY 401
HIGHWAY 403
HIGHWAY QEW
Regional Municipality of Halton
HIGHWAY 407
Lake Ontario
Regional municipalities
Credit Valley Conservation jurisdiction
NAI study area
Regional Municipality of Peel
Highway
0 2.5 5 10
Kilometers
This map is for information purposes only. The data displayed are derived from sources with different accuracies and all boundaries should therefore be considered approximate.
CVC Boundary and NAI Study Area (CVC 2011); Projection: UTM, z17, NAD83

This is the first report volume produced by the NAI project, providing summaries on NAI data for 100 natural areas across the study area. Additional site summaries will be published as ecological data is gathered. In addition to the production of these volumes, the NAI project has produced a web application with basic information on NAI areas (hosted on the Region of Peel website) and an internal database cataloging collected ecological data.

2.1. THE STUDY AREA

The study area for this NAI combines two elements: the jurisdiction of the Credit Valley Conservation Authority and the Region of Peel (Fig. 1).

Most of CVC's jurisdiction is comprised of the Credit River watershed but 13 small urban watersheds within Mississauga to the east and west of the Credit River that flow directly into Lake Ontario are also included (see the Hydrology section, later in this report, for more details). These small urban watersheds are also included in the NAI study area and their inclusion is implied throughout this report when general references are made to "the Credit River watershed". The Credit watershed covers approximately 1000 km^2 and is home to over 750,000 residents, inhabiting 11 municipalities (Fig. 2).

The Region of Peel covers 1254 km^2 and contains three municipalities (Fig. 2) with a total population of over 1.2 million. The majority of this population resides in the southern half of the region. Portions of 21 watersheds lie within the Region of Peel (Fig. 7).

Municipalities of the Study Area	Region or County
Township of Amaranth	County of Dufferin
Township of East Garafraxa	County of Dufferin
Town of Mono	County of Dufferin
Town of Orangeville	County of Dufferin
City of Brampton	Region of Peel
City of Mississauga	Region of Peel
Town of Caledon	Region of Peel
Town of Erin	County of Wellington
Town of Halton Hills	Halton Region
Town of Milton	Halton Region
Town of Oakville	Halton Region

Watersheds of the Region of Peel	% of Region of Peel	Conservation Authority Jurisdiction
Credit River	42%	Credit Valley Conservation
13 small Mississauga watersheds draining into Lake Ontario	5%	Credit Valley Conservation
Humber River	31%	Toronto and Region Conservation Authority
Etobicoke Creek	16%	Toronto and Region Conservation Authority
Mimico Creek	4%	Toronto and Region Conservation Authority
Nottawasaga River	0.9%	Nottawasaga Valley Conservation Authority

Holland River	0.8%	Lake Simcoe Region Conservation Authority
Joshua Creek & Sixteen Mile Creek	0.25%	Conservation Halton

The overall size of the NAI study area is 1607 km^2. The northern half of the study area is generally rural in nature and the southern half is urban. The area's population is concentrated in the southern, urban municipalities but the rural portion of the area does contain several smaller settlement areas. The study area contains three major physical features: the Oak Ridges Moraine, the Niagara Escarpment and the Lake Ontario shoreline.

3. PHYSICAL AND HISTORICAL CONTEXT

3.1. BEDROCK GEOLOGY

The Precambrian "basement" or Canadian Shield rocks of this area are granites and gneisses. During the Paleozoic era (505-408 million years ago), this area was covered by a sea. Marine sediments were deposited over the Canadian Shield rocks forming a thick layer of sedimentary bedrock: dolostones, limestones, sandstone, and shales. The oldest layer is the Georgian Bay Formation, composed of blue-grey shales with interbeds of siltstone, sandstone, limestone and dolostone. The soft red shales of the Queenston Formation were deposited next, over the older Georgian Bay Formation. Queenston Formation shales are predominantly red but also have narrow grey-green inter-bedded layers. Both the Georgian Bay and Queenston Formations are deep-water deposits. Later the sea became shallower and carbonate sedimentary rocks were deposited, first as the Amabel Formation and later as the Guelph Formation. These formations are of limestone and dolostone, much harder than the soft shale layers lying below them of the older formations (Fig. 3). The bedding plane of all of these formations is tilted from east to west, slightly higher in the east.

Over the next approximately 360 million years, weathering and erosion of the bedrock occurred. River valleys were carved into the bedrock, now filled by younger sediments and glacial deposits. The difference in hardness between the hard Amabel Formation dolostone and the soft Queenston shales below allowed differential erosion to create the Niagara Escarpment. The harder dolostone was more resistant to weathering and as the softer rock was eroded from beneath it, an escarpment face was formed. The weight of large overhanging blocks of dolostone would eventually collapse, maintaining a vertical escarpment face (Chapman and Putman, 1984; Credit Valley Conservation, 2007a; Davies and Holysh, 2007; Ontario Geological Survey, 2011).

More recently, glaciers covered southern Ontario and dramatically changed the landscape as they scraped and scoured the bedrock and deposited particulate debris, called till, ranging in size from boulders to fine sand and silt. The last glaciation occurred from 25,000 to 10,000 years ago. Water flowing within and off of the glacier formed glaciofluvial deposits: outwash plains, meltwater channels, kame moraines and eskers, all visible in the NAI study area. When glacial runoff was blocked and lakes were created, fine clays, silts and sands, called lacustrine deposits, were laid down (Chapman and Putman, 1984). Where arms of the glaciers met and where the edge of the glacial advance extended to, thick sand and gravel deposits formed hilly areas called moraines. Whaleback-shaped hills called drumlins formed during the advance of the glaciers and the axis of their orientation indicates the direction of movement of the glacier that deposited them. On occasion, large chunks of ice were left behind by the retreating glacier. When the ice chunk finally melted, kettle lakes were created in the depression that had been occupied by the ice.

In the NAI study area, exposed bedrock outcrops are limited to the Niagara Escarpment and along river valleys where the overlying overburden has been eroded away (Chapman and Putman, 1984;

Figure 2

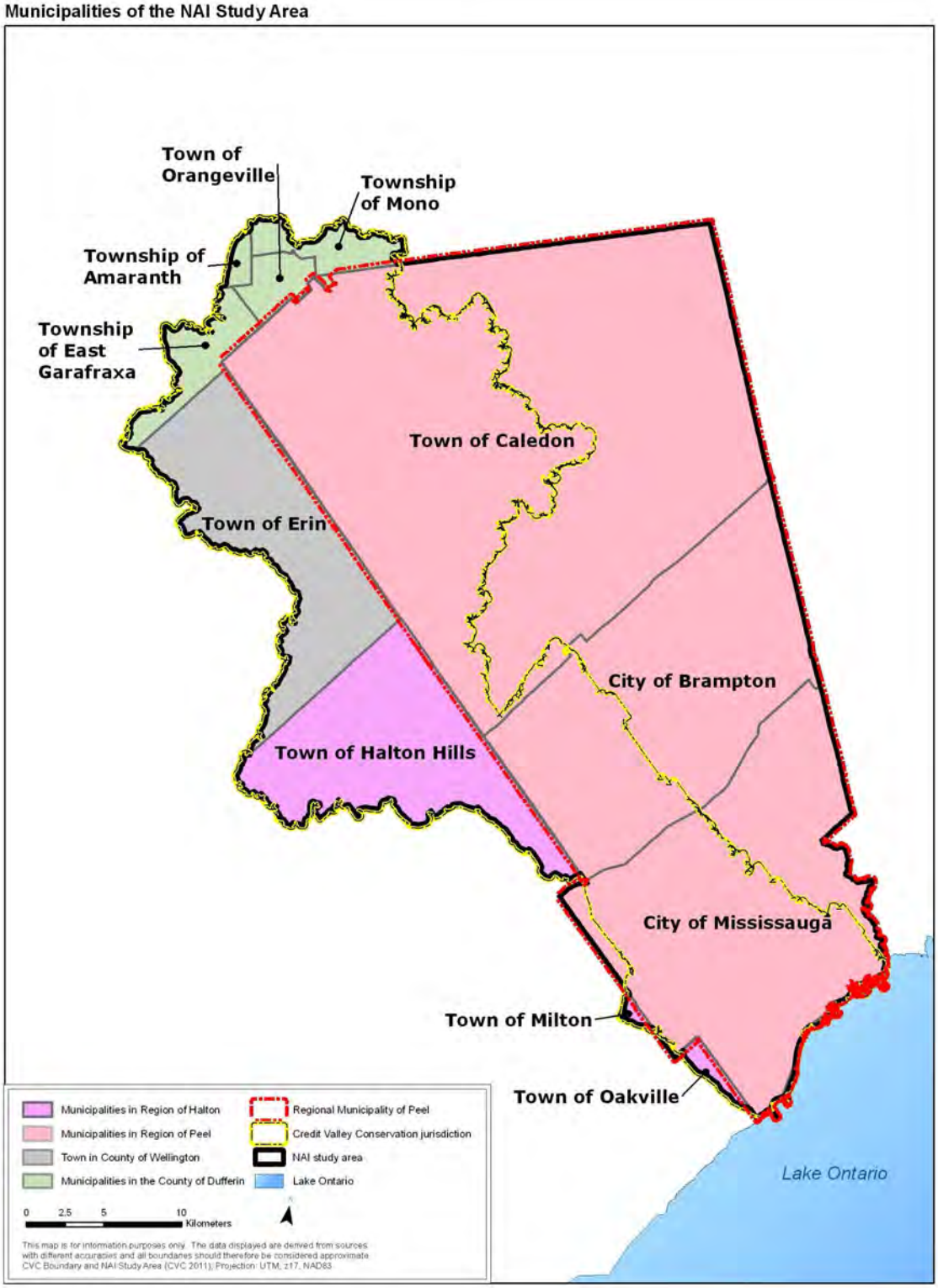
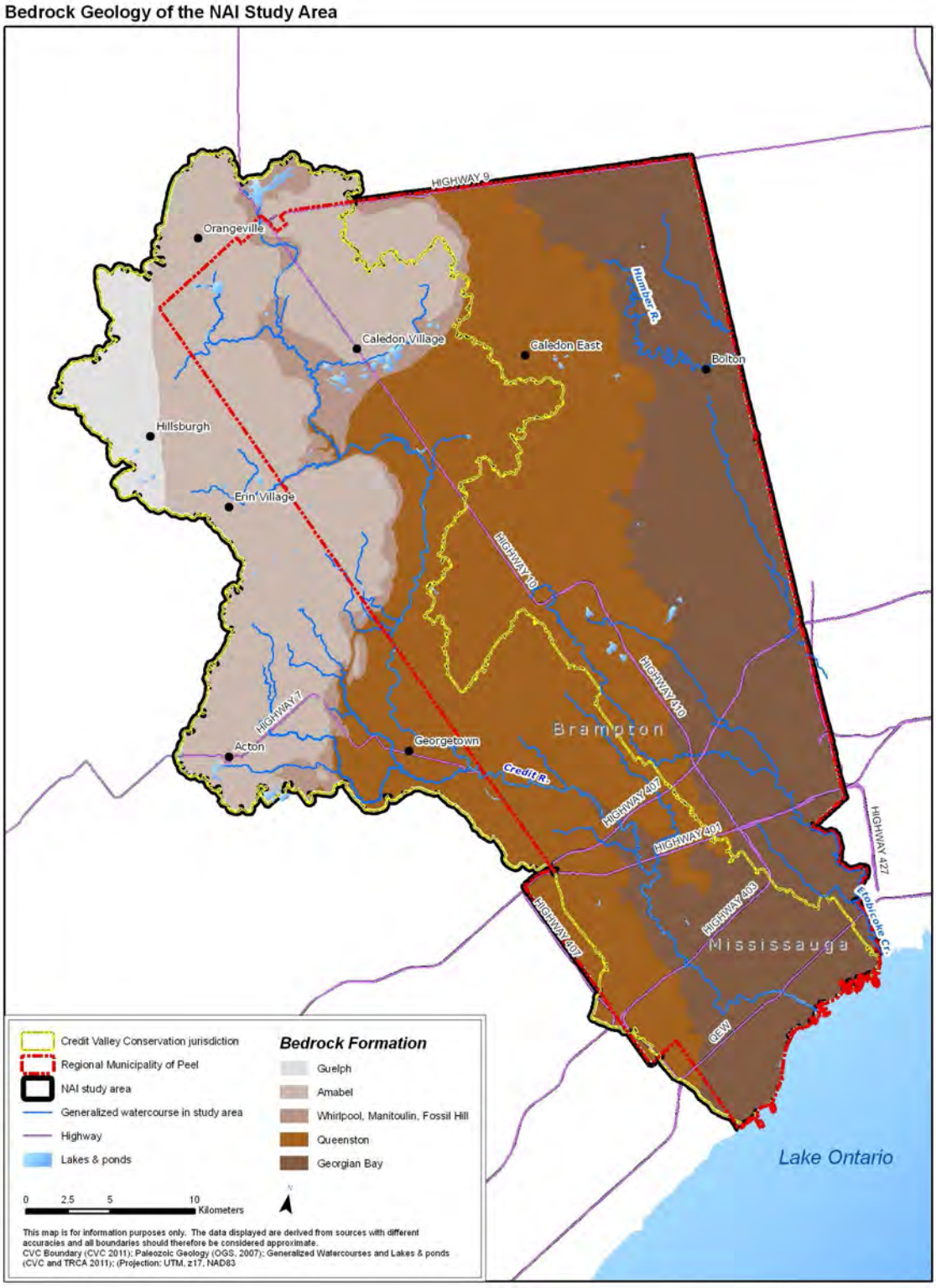

Municipalities of the NAI Study Area
Town of Orangeville
Township of Mono
Township of Amaranth
Township of East Garafraxa
Town of Caledon
Town of Erin
City of Brampton
Town of Halton Hills
City of Mississauga
Town of Milton
Town of Oakville
Lake Ontario
Municipalities in Region of Halton
Municipalities in Region of Peel
Town in County of Wellington
Municipalities in the County of Dufferin
Regional Municipality of Peel
Credit Valley Conservation jurisdiction
NAI study area
Lake Ontario
0 2.5 5 10 Kilometers
This map is for information purposes only. The data displayed are derived from sources with different accuracies and all boundaries should therefore be considered approximate.
CVC Boundary and NAI Study Area (CVC 2011); Projection: UTM, z17, NAD83

Figure 3


Bedrock Geology of the NAI Study Area
HIGHWAY 9
Orangeville
Caledon Village
Caledon East
Bolton
Humber R.
Hillsburgh
Erin Village
HIGHWAY 10
HIGHWAY 410
HIGHWAY 17
Acton
Georgetown
Brampton
Credit R.
HIGHWAY 407
HIGHWAY 401
HIGHWAY 427
HIGHWAY 409
Etobicoke Cr.
Mississauga
HIGHWAY 427
QEW
Lake Ontario
Credit Valley Conservation jurisdiction
Regional Municipality of Peel
NAI study area
Generalized watercourse in study area
Highway
Lakes & ponds
Bedrock Formation
Guelph
Amabel
Whirlpool, Manitoulin, Fossil Hill
Queenston
Georgian Bay
0 2.5 5 10 Kilometers
This map is for information purposes only. The data displayed are derived from sources with different accuracies and all boundaries should therefore be considered approximate.
CVC Boundary (CVC 2011); Paleozoic Geology (OGS, 2007); Generalized Watercourses and Lakes & ponds (CVC and TRCA 2011); (Projection: UTM, z17, NAD83

Credit Valley Conservation, 2007a, b). Over the rest of the study area, glacial deposits cover the bedrock.

It is this history of glaciation and the bedrock geology that have largely shaped the current physiography of the NAI study area. Some later erosion and alluvial deposits have occurred in river valleys and organic deposits have formed more recently.

3.2. PHYSIOGRAPHY (SURFICIAL GEOLOGY)

The physiography of a landscape dictates elevation, drainage patterns, soil texture and chemistry, and thus influences hydrology, as well as local climate and the movement and accumulation of materials across the landscape (Lee *et al*., 1998). Through these mechanisms, physiography influences ecological patterns of the landscape. Physiographic regions have been identified in southern Ontario (Chapman and Putnam, 1984) and the NAI study area falls mainly into eight physiographic regions as outlined below (Credit Valley Conservation, 2007b; Toronto and Region Conservation Authority, 2002, 2008; Fig 4)

3.2.1. Dundalk Till Plain: This physiographic region occurs in what is commonly referred to as the "the roof of Ontario". It is a plain that slopes to the basins of Georgian Bay, Lake Huron and Lake Ontario. The plain is gently rolling with low topographic relief and many shallow, poorly-draining depressions containing wetlands. Some low drumlins are present with long axes oriented northwest-southeast. Glacial overburden deposits are shallow in this area. Soils here are primarily silty loams with imperfect drainage. Only a small part of the NAI study area occurs in this physiographic region.

3.2.2. Hillsburgh Sandhills (Orangeville Moraine): The Hillsburgh Sandhills physiographic region is found in the northwestern portion of the study area and consists of coarse-grained sediments. It is an area of high relief with thick deposits of glacial outwash (sandy materials) overlying glacial tills and bedrock. In higher regions, well-drained terrestrial communities (e.g. forests) are found, while lower areas yield wetlands (e.g. swamps) (Chapman and Putman, 1984; Credit Valley Conservation, 2007b).

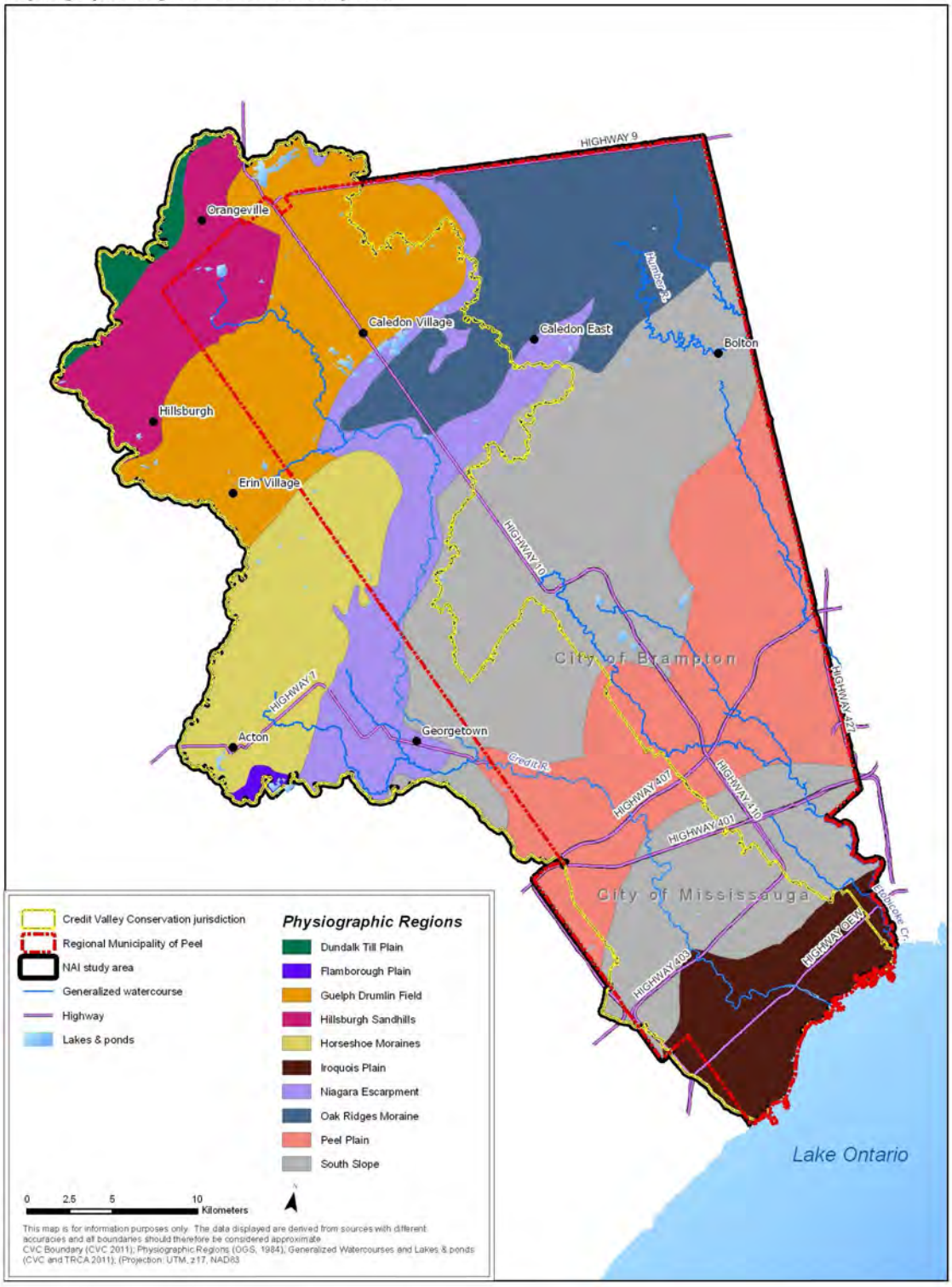
3.2.3. Guelph Drumlin Field: This is a region of low, rolling, streamlined drumlins located between the Hillsburgh Sandhills to the west and the Horseshoe Moraines to the southeast. The drumlins are separated from one other by interconnected meltwater channels, which in some instances have formed valleys. The drumlin till is loamy and calcareous and the valleys often have sand and gravel terraces along their edges; the low-lying area is comprised of mostly fluvial materials and is often swampy (Chapman and Putman, 1984; Credit Valley Conservation, 2007b).

3.2.4. Horseshoe Moraines (Paris and Singhampton Moraines): This physiographic region consists of a broad belt of north-south trending moraines (of sand and salt tills) lying west of the Niagara Escarpment, between Orangeville and Acton (Chapman and Putman, 1984). Soils of this physiographic region are coarse-grained and more permeable than in other parts of the study area, allowing for significant recharge (infiltration) of water to underground aquifers (Credit Valley Conservation, 2007b).

3.2.5. Flamborough Plain: This physiographic region consists of a level plain of shallow glacial deposits overlying limestone bedrock. The flat topography produces numerous shallow wetland pockets. Some scattered low drumlins are present with long axes oriented east-west. Soils in this physiographic region are shallow with an exception being on the drumlins that have somewhat deeper soils (and making them attractive for agriculture). Only a very small part of the NAI study area occurs on the Flamborough Plain.

Figure 4

Physiographic Regions of the NAI Study Area



3.2.6. Niagara Escarpment: The Niagara Escarpment is the most distinctive physiographic feature in the NAI study area. The community interest to strike a balance between preservation, development and enjoyment of the landscape associated with the Niagara Escarpment led to its declaration as a World Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization (UNESCO). This physiographic region forms a north-south trending strip along the escarpment, which is a major topographic break in the bedrock (between the carbonate Amabel Formation to the west and the soft sediments of the Queenston Formation to the east). Vertical cliffs and frequent bedrock exposures exist along the Niagara Escarpment south of Forks of the Credit but glacial deposits (primarily the Oak Ridges Moraine) generally bury the escarpment bedrock north of Forks of the Credit. Areas of exposed bedrock, cliffs, caves, crevices, talus slopes and thin soils are not suitable for many types of plants; however the escarpment geology does provide habitat for specialized species that cannot survive elsewhere. Bedrock and fine-grained till such as that found in this physiographic region typically do not conduct water easily. Groundwater is only plentiful when the porous Amabel Formation underlies the shallow glacial till (Credit Valley Conservation, 2008), and in these areas, large wetlands exist (Credit Valley Conservation, 2007b; Credit Valley Conservation 2007c). Forests are possible in areas where adequate soils exist (Credit Valley Conservation, 2007b).

3.2.7. Oak Ridges Moraine: This physiographic region consists of an extensive interlobate moraine (i.e. a moraine formed from the deposits of multiple lobes of a glacier) that extends from the Niagara Escarpment east to the Trent River (just west of Belleville). Most of this physiographic region is characterized by hummocky hills of fine grained sand and gravel, allowing infiltration of water to underground aquifers and the slow release of water into rivers flowing to Lake Ontario. The Oak Ridges Moraine plays a crucial role in maintaining the quality and quantity of drinking water. The moraine itself, however, lacks many streams, as the water drains vertically through the sand and gravel, moving laterally only when it reaches less pervious beds and reappearing as springs along the slopes of the moraine. Small kettle wetlands exist in depressions between hills, made by the melting of glacial ice blocks. Much of the original vegetation of this physiographic region was a mixed forest of pine and hardwoods (Sugar Maple, *Acer saccharum* ssp. *saccharum*; American Beech, *Fagus grandifolia*; Red Oak, *Quercus rubra*; and White Oak, *Quercus alba*). However, many trees, especially Eastern White Pine (*Pinus strobus*) were heavily harvested in the past and few large trees remain today (Chapman and Putman, 1984; Credit Valley Conservation, 2007b, 2010a; Toronto and Region Conservation Authority, 2008).

3.2.8. South Slope: This physiographic region extends from the base of the Niagara Escarpment to the Iroquois Plain physiographic region and encompasses portions of the Palgrave and Cheltenham Moraines and part of the Trafalgar Moraine. In the NAI study area the South Slope region is bisected by the Peel Plain physiographic region. The South Slope is characterized by low-lying, fine-grained, undulating ground moraine and knolls. The till is part of the Halton Till layer which created fertile soils, once supporting rich upland forests. In areas of groundwater discharge, cedar swamps and meadow marshes were present (Chapman and Putman, 1984; Credit Valley Conservation, 2007b; Toronto and Region Conservation Authority, 2008). However, this area is highly valued for agriculture and is also becoming increasingly urbanized. It has been greatly altered by agricultural and urban land use practices (in similar ways to the Peel Plain, see below). The soils have low permeability and groundwater infiltration is limited. Localized pockets of sand and gravel exist amongst the moraines (e.g. in Brampton and Georgetown) serving as areas of groundwater infiltration that feed local lakes and streams (Credit Valley Conservation, 2007b).

3.2.9. Peel Plain: An area of dense clay soils were deposited when glacial melt-water ponded on top of the low permeability Halton Till plain (underlain by shale and some limestone). This area of almost-flat topography forms the Peel Plain physiographic region (Chapman and Putman, 1984; Credit Valley Conservation, 2007b). Historically, parts of the Peel Plain were poorly-drained and other parts were well-drained. Well-drained areas had high-quality hardwood forests (e.g. Sugar Maple, American Beech, White Oak, Hickories, *Carya* spp.; American Basswood, *Tilia americana*) and some White Pine. Poorly-drained areas had forests of American Elm (*Ulmus americana*), White

Ash (*Fraxinus americana*) and White Cedar (*Thuja occidentalis*) as well as wetlands (Chapman and Putman, 1984; Toronto and Region Conservation Authority, 2002). Today, this physiographic region has been greatly altered by deforestation and wetland drainage to support agricultural and urban land uses. The extensive human use of this area has, in some places, actually changed the topography of the landscape, through earth displacement and filling, and watercourse alteration (re-alignment and engineering).

3.2.10. Iroquois Plain: This physiographic region is an area of gentle slope, from the shoreline of Lake Ontario, back about 3-5 km. This plain is the remnant shoreline of glacial Lake Iroquois. The plain was smoothed over time by wave action and lacustrine deposits. Now this physiographic region is composed of a thin veneer of glacio-lacustrine sand and silty sand. These sandy soils once supported forests, savannahs and prairies, populated by species of the Carolinian Ecoregion at close to their northern extent. In the NAI study area, all of the Iroquois Plain is urban.

3.3. SOILS

Soils are produced by the decomposition of mineral parent material and organic material. They are heavily influenced by the composition of the bedrock parent material, topography, climate and environmental conditions where they occur (Hoffman and Richards, 1953). Soils in the study area are closely influenced by the glacial history of the area and glacial deposits that remain.

In general, over the NAI study area, sandy loams and loams are the predominant soils above the Niagara Escarpment in the area with moraines and drumlins (Fig. 5). These soils are coarse-grained and tend to drain well, although there are also many small pockets of poorly draining soils associated with wetlands in moraine depressions and kettles (Fig. 6). A band of sandy loam soils also occur along the old Lake Iroquois shoreline. Soils below the Niagara Escarpment are mainly clay and clay loams. These fine-grained soils drain less well to poorly. The river valleys tend to have variable soils more closely associated with recent erosional processes and less related to the glacial deposits of the area.

3.4. HYDROLOGY

Watersheds are areas of land whose waters drain into one river, lake, or other body of water. Watershed boundaries are determined by the elevation and natural contours of the landscape. There are several major watersheds that fall partly or fully within the NAI study area: the watersheds of the Credit River, the Humber River, Etobicoke Creek and Mimico Creek (Fig. 7). As mentioned in an earlier section (The Study Area), there are also several minor watersheds of creeks within the NAI study area that flow directly into Lake Ontario, and small portions of headwater tributaries of the Nottawasaga River and Holland River in the northeast corner of the study area.

The drainage area of the Credit River watershed is approximately 1,000 square kilometers and the entire watershed is included in the NAI study area. The main branch of the Credit, originating north of Orangeville and flowing southerly to its mouth in Lake Ontario at Port Credit, Mississauga, is over 90 kilometers in length (Credit Valley Conservation, 2007b; Fig. 8). The Credit River has approximately 1500 km of tributaries. Credit Valley Conservation recognizes 15 major named tributaries of the Credit River (as subwatersheds). The Humber River drains an area of 912 km^2 of which approximately 350 km^2 lies in the study area. Its main course is over 100 km in length from the top of the Niagara Escarpment near Mono Mills to the shore of Lake Ontario at the western outskirts of Toronto. Most of the upper reaches of the main branch of the Humber River as well as the upper half of the West Branch of the Humber River fall within the study area. Toronto and Region Conservation Authority recognize 13 major named tributaries of the Humber River (some are outside this study area). Etobicoke Creek and Mimico Creek both originate on the south slope of the Oak Ridges Moraine near Caledon and flow southeast to their mouths at Lake Ontario. Mimico Creek has a total length of just over 32km and drains 77 km^2. Only the upper half of Mimico Creek's watershed is

Figure 5

Soil Types of the NAI Study Area

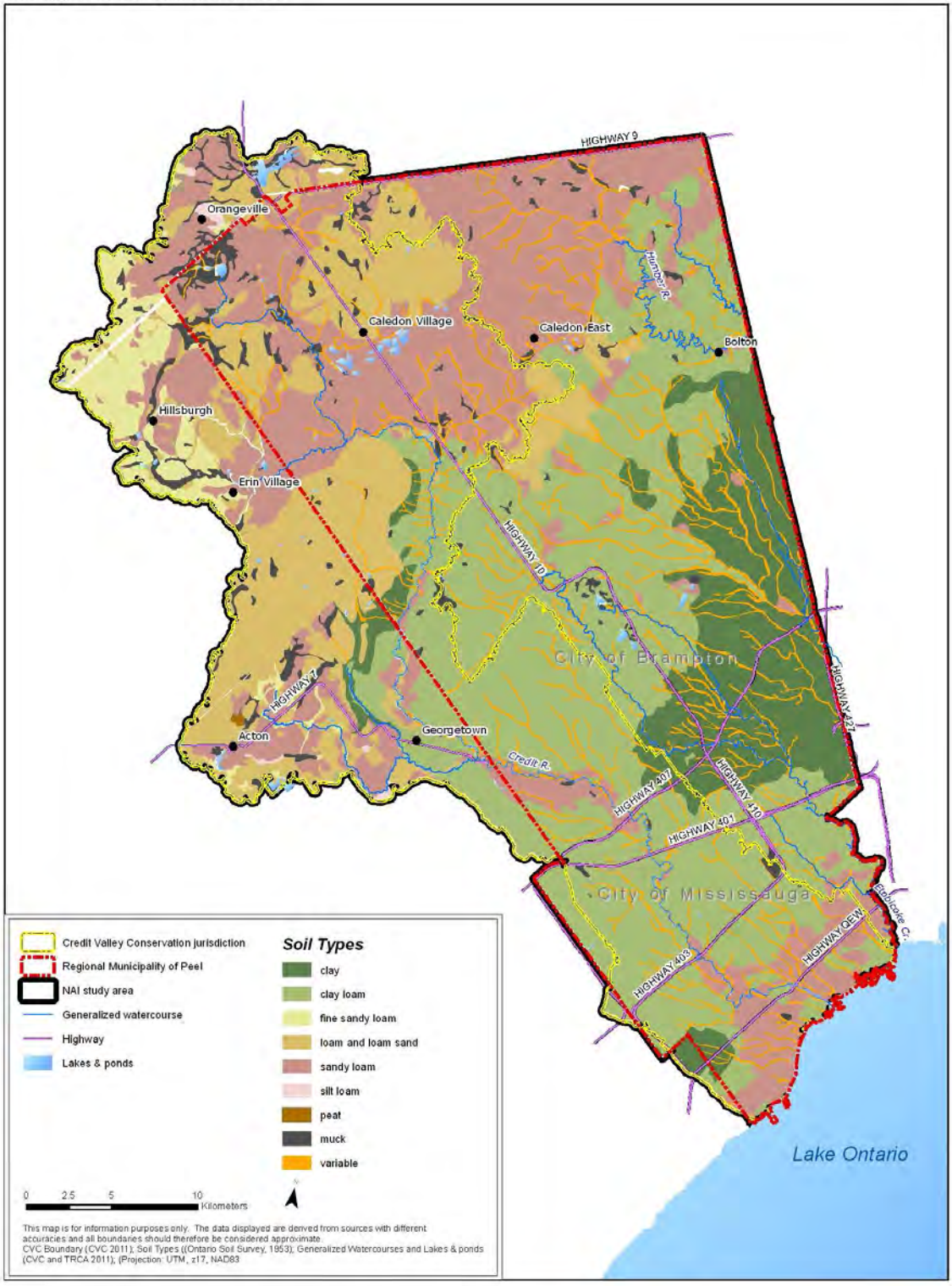


Figure 6

Soil Drainage of the NAI Study Area

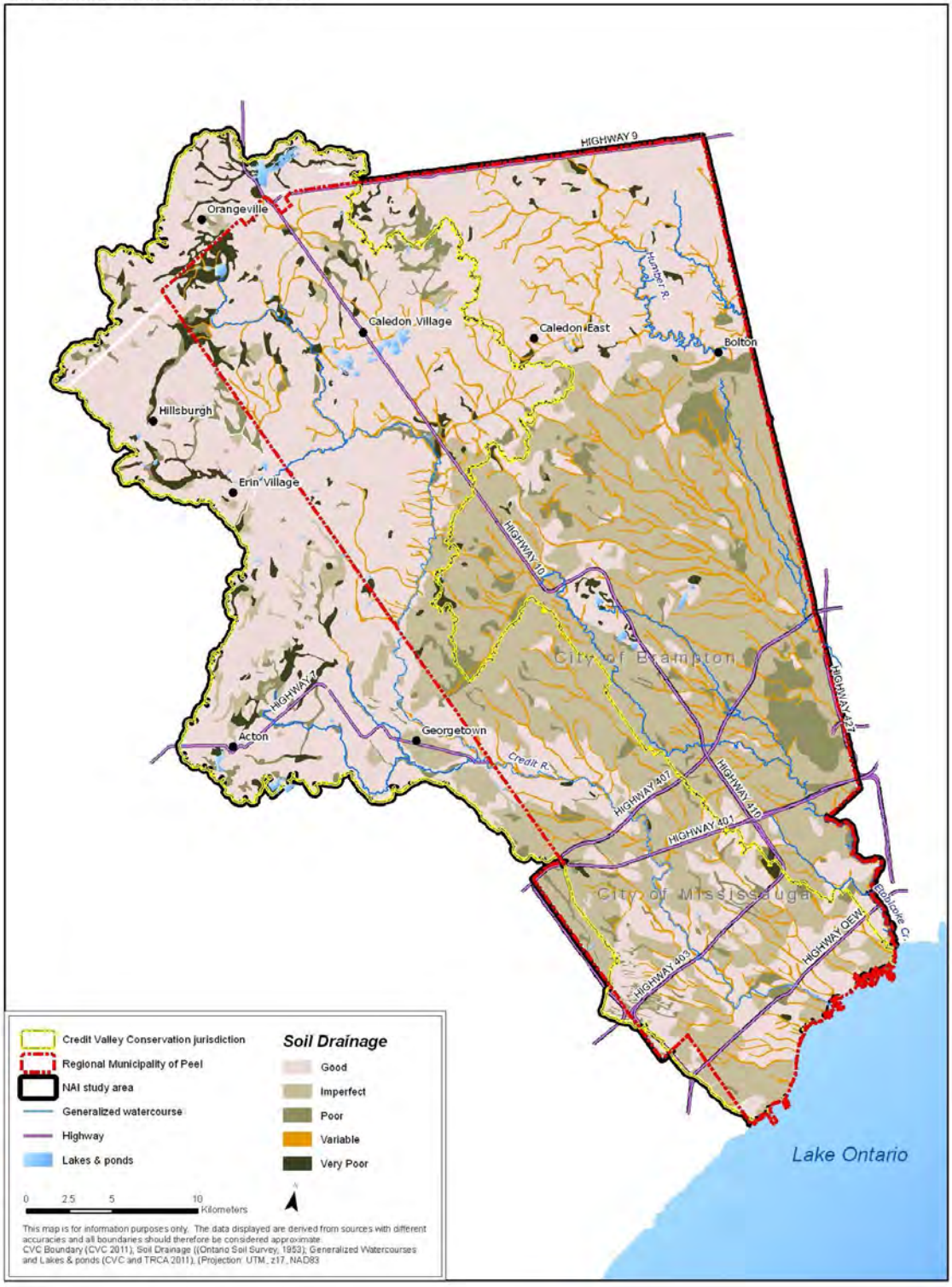


Figure 7

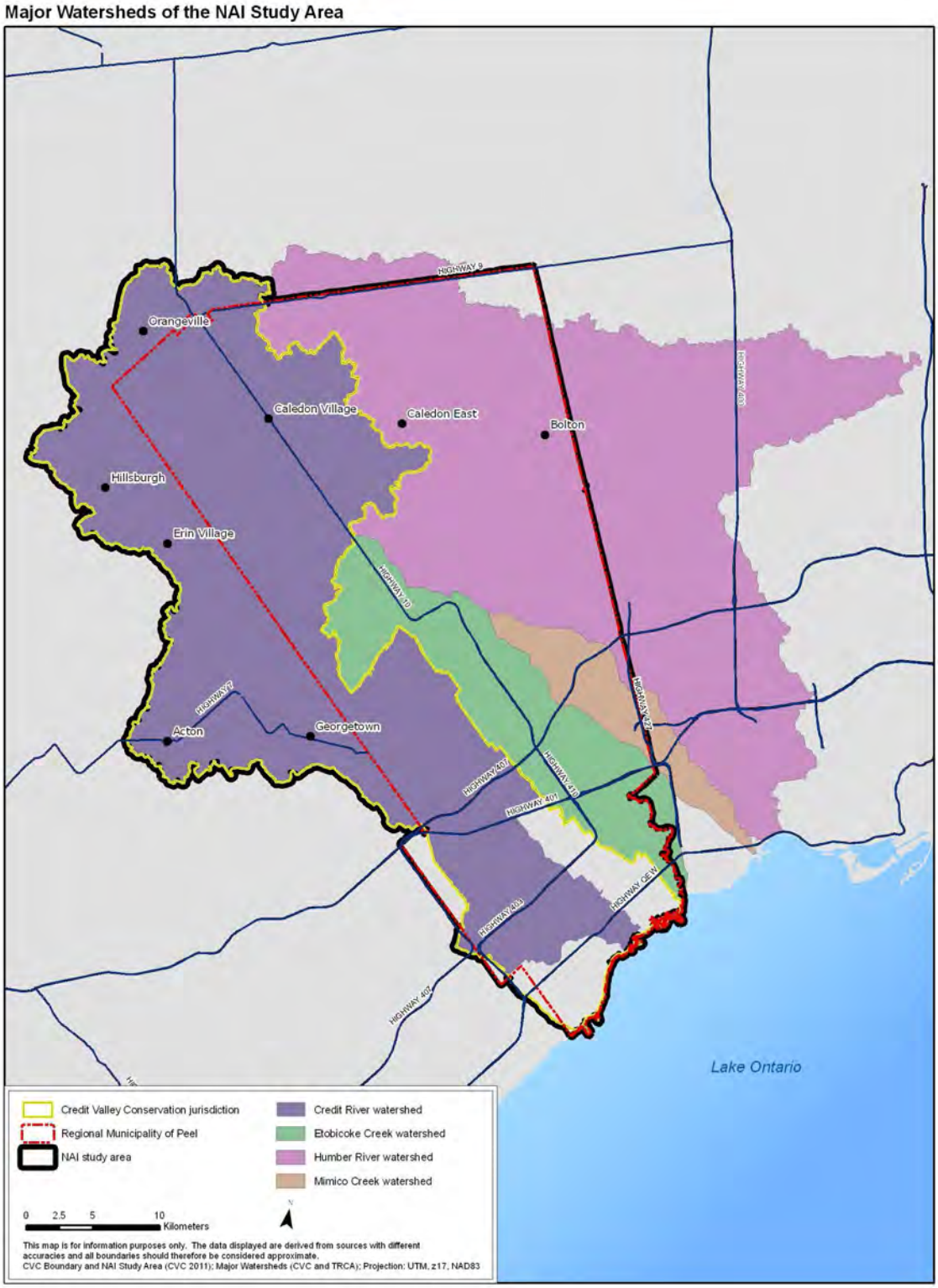
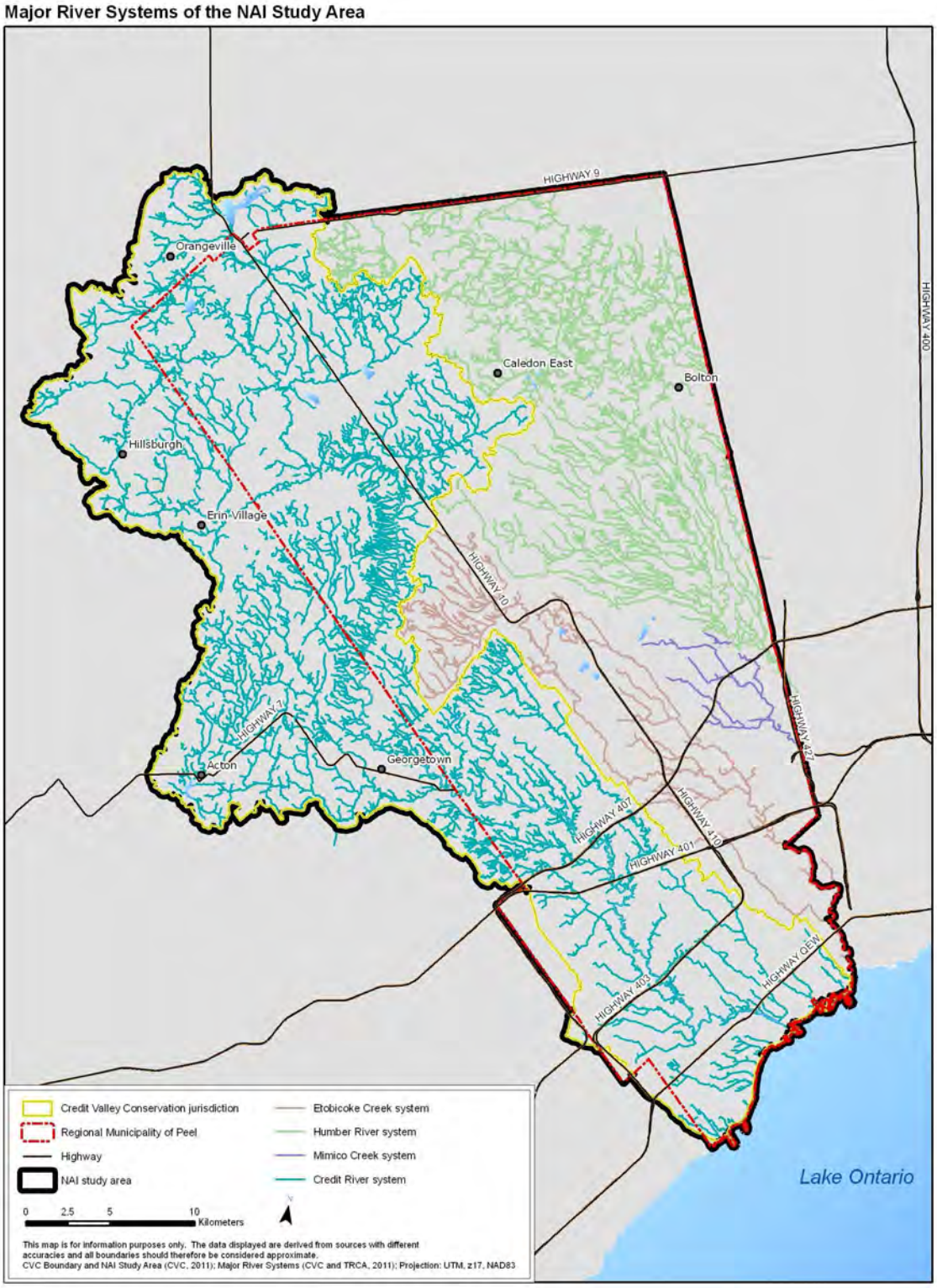

Major Watersheds of the NAI Study Area
Orangeville
Caledon Village
Caledon East
Bolton
Hillsburgh
Erin Village
Acton
Georgetown
HIGHWAY 9
HIGHWAY 10
HIGHWAY 7
HIGHWAY 27
HIGHWAY 407
HIGHWAY 401
HIGHWAY 403
HIGHWAY 427
HIGHWAY 400
Lake Ontario
Credit Valley Conservation jurisdiction
Regional Municipality of Peel
NAI study area
Credit River watershed
Etobicoke Creek watershed
Humber River watershed
Mimico Creek watershed
0 2.5 5 10
Kilometers
This map is for information purposes only. The data displayed are derived from sources with different accuracies and all boundaries should therefore be considered approximate.
CVC Boundary and NAI Study Area (CVC 2011); Major Watersheds (CVC and TRCA); Projection: UTM, z17, NAD83

Figure 8


Major River Systems of the NAI Study Area
HIGHWAY 9
Orangeville
Caledon East
Bolton
HIGHWAY 400
Hillsburgh
Erin Village
HIGHWAY 10
HIGHWAY 7
Acton
Georgetown
HIGHWAY 427
HIGHWAY 407
HIGHWAY 410
HIGHWAY 401
HIGHWAY QEW
HIGHWAY 403
Lake Ontario
Credit Valley Conservation jurisdiction
Regional Municipality of Peel
Highway
NAI study area
Etobicoke Creek system
Humber River system
Mimico Creek system
Credit River system
0 2.5 5 10 Kilometers
This map is for information purposes only. The data displayed are derived from sources with different accuracies and all boundaries should therefore be considered approximate.
CVC Boundary and NAI Study Area (CVC, 2011); Major River Systems (CVC and TRCA, 2011); Projection: UTM, z17, NAD83

included in the NAI study area. Etobicoke Creek's watershed is 211 km^2 in size and is situated between Mimico Creek and the Credit River (Toronto and Region Conservation Authority, 2002, 2008). Almost all of the Etobicoke Creek watershed lies within the NAI study area with only a small part of the east side of the lower creek basin outside the Region of Peel. The lower reaches of Etobicoke Creek form the municipal boundary between the City of Mississauga and the City of Toronto.

In addition to the four major watersheds described above, there are small portions of other watersheds or small creek basins that are also included in the study area. The study area includes the small watersheds of Applewood Creek, Avonhead Creek, Birchwood Creek, Cawthra Creek, Clearview Creek, Cooksville Creek, Lakeside Creek, Lornewood Creek, Moore Creek, Serson Creek, Sheridan Creek, Tecumseh Creek, Turtle Creek, all of which drain directly into Lake Ontario, to the east or west of the Credit River. The northeast corner of the study area contains small portions of the headwaters of the Nottawasaga River and Holland River. The southwest edge of the study area includes small parts of the watersheds of Joshua Creek and Sixteen Mile Creek.

Precipitation falling in areas with highly permeable soils (e.g. sand, gravel) will infiltrate to the water table and flow within the groundwater system at a greater rate than precipitation falling on soils with low permeability (e.g. silt, clay). Groundwater flows both laterally and vertically depending on soil and rock permeability and the presence of boundaries (i.e. streams, lakes) which can either add or remove water from the groundwater system (Credit Valley Conservation, 2007b).

The regional groundwater flow system is controlled primarily by topographic relief, and the ability of the subsurface geologic material to transmit water. Highest groundwater levels are in the northwest, declining towards the Escarpment, except where influenced by buried bedrock valleys, such as along the West Credit and main branch of the Credit River above Forks of the Credit. In areas where rivers or streams intersect the water table, groundwater will discharge into the stream or river and contribute baseflow to the surface water feature (Credit Valley Conservation, 2007b). For example, 65% of the Credit River's flow comes from groundwater (Credit Valley Conservation, 2010a). Groundwater is also important for improving water quality, and supporting seeps which often have a high diversity of plant communities and species (Credit Valley Conservation, 2007a, b). In addition to maintaining river flow rates during periods of low or no precipitation, groundwater also helps to keep temperatures of streams low, supporting cold and cool-water aquatic communities. During the winter months, when groundwater is warmer than (frozen) surface water, the presence of groundwater flows provides important wildlife habitat.

There are two regionally significant groundwater aquifers within the Credit River Watershed: the Guelph/Amabel Formation found west of the Niagara Escarpment and buried bedrock valleys (filled with coarse-grained glacial overburden deposits) found throughout the study area (Credit Valley Conservation, 2007b). Some of these buried valleys are known to contain large volumes of groundwater, including aquifers in both Halton and Peel Regions (Credit Valley Conservation, 2007b), that municipalities tap to supply municipal water. The Oak Ridges Aquifer Complex (shallowest), Thorncliffe Aquifer Complex and Scarborough Aquifer Complex (deepest) are other regionally important groundwater sources in the east part of the study area.

3.5. HUMAN HISTORY

After the last glaciers retreated about 10,000 years ago, this area would have become habitable, and archaeological evidence has been collected of aboriginal hunting camps and villages along the Credit River and Humber River valleys that date from approximately 8000 B.C (City of Brampton, 2011).

Early inhabitants included people of the Iroquois First Nations and the Mississauga First Nation. By the mid-1600's, Europeans began visiting the area and had initiated trade with the First Nations by the 1720's. For example, the Credit River is so-named because trade goods were provided to the

First Nations at the mouth of the Credit River "on credit" in exchange for furs that would be delivered later (Heritage Mississauga, 2009). Between 1805 and 1820, the Mississaugas signed land treaties with the British Crown and the area became available for European settlement (*ibid*).

In addition to European settlers, some of the settlers to this area were United Empire Loyalists who had remained loyal to the British Crown during the American Revolution. After the Revolution they immigrated to this area and were given land grants (Mackenzie, 2008). Steady settlement occurred throughout the early 1800's. Land clearing for agriculture and to support logging were major activities. Many wetlands were filled in to accommodate alternative land uses and certain wildlife species were extirpated from the area due to human persecution (e.g. Wolves, Massasauga Rattlesnakes; Bull, 1938, Mulvany *et al*., 1885). Stone quarrying for building materials was also a significant land use in some parts of the study area.

During the 1900's, increased industrial development put strain on the natural environment and resulted in impacts such as sewage problems, industrial waste from saw and grist mills entering waterways, and sedimentation from sand and gravel extraction operations. Atlantic Salmon (*Salmo salar*), once extremely abundant, were extirpated from the area around the 1890's (Credit Valley Conservation, Undated).

Throughout the 1900's, the population of the study area grew. A large portion of the study area is located within the Greater Toronto Area (GTA). The population of the GTA tripled between 1951 and 2001 and is the largest urban concentration of people within Canada, with over five million inhabitants (Credit Valley Conservation, 2004). The population of the GTA is expected to swell to eight million by 2031 (Ontario Ministry for Public Infrastructure and Renewal, 2006)

Urban development creates extensive areas of impermeable surfaces (e.g. roads, roofs and pavement) that will adversely affect water quantity and quality. Development can lead to an outright loss of natural areas with consequent biodiversity decreases, fragmentation and isolation of remaining natural patches, an increase in surface water flows and a contamination of groundwater supplies, and a decrease in quality and diversity of aquatic communities. Larger urban populations put increased pressure on those natural resources and areas that remain. More recently though, public awareness and understanding of natural processes, ecological issues and environmental benefits and services has been gradually increasing. Municipalities, the public, institutions, agencies and businesses are increasingly interested and engaged in the stewardship of natural areas and in the restoration of degraded areas.

4. NATURAL HERITAGE CONTEXT

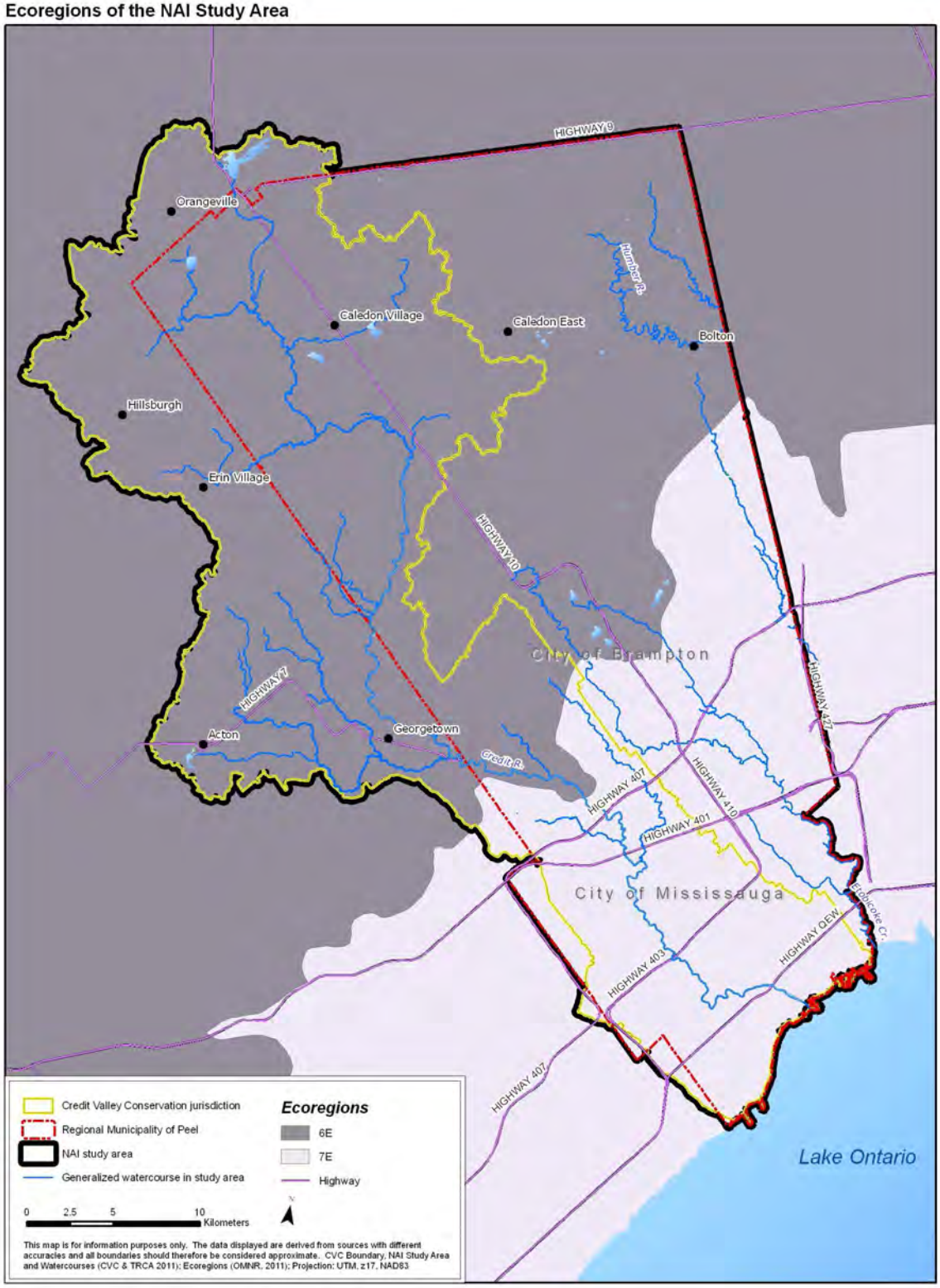
4.1 ECOREGIONS

The Ontario Ministry of Natural Resources has defined broad "ecoregions" in Ontario, characterized by climate, forest ecosystems and wildlife species (Watkins, 2006). The NAI study area includes two ecoregions: the Lake Erie-Lake Ontario Ecoregion 7E (more familiarly known as the Carolinian Forest Region) and the Lake Simcoe-Rideau Ecoregion 6E (Fig. 9).

The Carolinian Forest Ecoregion (Lake Erie-Lake Ontario Ecoregion) occurs in the southern portion of southern Ontario (Lee *et al*., 1998). The predominantly limestone bedrock is deeply buried by tills and sediments in this ecoregion and the topography is relatively flat. The Carolinian Forest Ecoregion coincides with the Deciduous Forest Region, representing the northernmost extension of the deciduous forests typical of the eastern and southeastern United States. Many tree and shrub species of the Deciduous Forest Region have their northern range limits in the Carolinian Forest Ecoregion, such as Tulip Tree (*Liriodendron tulipifera*), Black Gum (*Nyssa sylvatica*), Sassafras (*Sassafras variifolium*), Flowering Dogwood (*Cornus florida*), several species of Hickory and several Oak species. This ecoregion covers less than 1% of Canada's land mass but is home to more than 25% of Canada's population (of approximately 34 million) and over 90% of Ontario's 13 million

Figure 9

Ecoregions of the NAI Study Area



residents. This ecoregion has the highest proportion of development in Ontario. The resultant high level of natural habitat loss and limited extent of this ecoregion (in Ontario and in Canada) means that many species characteristic of this ecoregion are rare and may be at risk.

The Lake Simcoe-Rideau Ecoregion occurs south of the Precambrian shield, in the northern portion of southern Ontario (Lee *et al*., 1998). In the study area, the bedrock is buried by glacial deposits. The topography is relatively flat, except near the Niagara Escarpment. This ecoregion occupies the southern part of the Great Lakes-St. Lawrence Forest Region (the forest region extends north onto the Precambrian shield). This forest region is characterized by a variety of forest types (deciduous, coniferous, mixed) with a mixture of northern and southern species, as species composition transitions between the deciduous forests to the south and the coniferous (boreal) forests to the north. In the Lake Simcoe-Rideau Ecoregion, the forests tend to have a greater proportion of southern species than the same forest region does in the ecoregion to the north.

In the NAI study area, the transition between Ecoregions 6E and 7E occurs in the area of Brampton and southern Halton Hills.

4.2. THE STATE OF NATURAL HERITAGE AND ENVIRONMENTAL FEATURES

Natural areas face numerous threats in Ontario, including those in the NAI study area. Since European settlement a large portion of the forests have been cleared and wetlands drained. Urbanization of agricultural areas has caused even further fragmentation of natural areas, making them more susceptible to damage by invasive species, pests and disease. The loss and degradation of habitat has resulted in a loss of species and a decline in biodiversity. The effects of land clearing and urbanization have altered the quality and quantity of ground and surface waters. With increasing urbanization humans are becoming more heavily dependent on the remaining natural areas for the provision of ecosystem goods and services (Credit Valley Conservation, 2011). Non-native species alter existing species compositions and can crowd out native species. Climate change can increase environmental stress by increased storms, drought, and lower water levels.

4.2.1. Land Use Changes: Since European settlement, the landscape across southern Ontario has undergone dramatic change, including the NAI study area. Lands previously covered by continuous forests, swamps and marshes were cleared for agriculture and wood products by early settlers. It is estimated that about 90% of southern Ontario's land base was forested prior to European settlement (Larson *et al*., 1999). In the NAI study area, approximately 21% forest cover remains (Regional Municipality of Peel, 2008). The majority of this occurs above the Niagara Escarpment (42% forest cover). Rural areas below the escarpment (south Caledon) have only 11% forest cover remaining and urban areas (Brampton and Mississauga) have 7% forest remaining (Regional Municipality of Peel, 2008), a pattern that illustrates the northward advancement of urbanization from where it was initiated near the Lake Ontario shoreline. This pattern also reflects the high value of gently sloping lands with good soils below the escarpment for agriculture. Countering this trend (but not out-weighing it) is the more recent phenomenon of the return of marginal agricultural lands to natural cover. This is particularly noticeable above the escarpment where old fields are being allowed to undergo succession, eventually back to treed communities.

Wetland loss due to changing land use is an issue in the study area, as it is throughout southern Ontario. In southern Ontario, 76% of large (>10ha) wetlands have been lost following European settlement, primarily through early conversion of land for agriculture and more recently due to urban development. In addition to loss of wetland habitat and associated species, and thus decreases in overall biodiversity of the area, there is consequent loss in the ecological functions that wetlands provide. Wetlands play important roles in slowing runoff and reducing the potential for flooding, purifying water of nutrients and other pollutants, reducing sediment loads in water, providing nursery habitat for aquatic wildlife and nesting and foraging habitat for terrestrial wildlife.

4.2.2. Habitat Fragmentation: Habitat fragmentation has increased with more recent urbanization (Credit Valley Conservation, 2011). Roads can result in fragmented and isolated plant and wildlife populations. Natural areas that are fragmented by non-natural land are less resilient because species and genetic diversity are harder to maintain over time (Forman, 1995). Natural areas which are already under stress from fragmentation and degradation will be more susceptible to stresses caused in the future by climate change.

4.2.3. Water Quality and Quantity: Loss of natural vegetation cover has had a negative affect on water quality and quantity. The reduction of streamside vegetation and increased impervious (paved) cover associated with urbanization has caused an increase in runoff and sediment loading in watercourses (Credit Valley Conservation, 2007b). Hydrological regimes have been affected by land clearing and urbanization resulting in changes in groundwater levels and inputs to river and stream baseflow levels (Credit Valley Conservation, 2011). Land clearing and urbanization often cause streams and rivers in urban areas to experience rapid increases in runoff during storm events, elevated concentrations of nutrients and contaminants, altered channel morphology and/or realignment of watercourses, increased stream temperatures, depletion of dissolved oxygen, reduced biodiversity and an increase of tolerant species, and reduced nutrient uptake.

4.2.4. Invasive Species: Over time, many non-native species have been introduced to the area both intentionally and accidentally. While some of these non-native species are relatively benign, others can invade communities aggressively and negatively affect terrestrial, wetland and aquatic communities. It is thus important to mark the distinction between non-native and invasive species – not all non-native species are invasive, but all invasive species are non-native (Pysek *et al*., 2004).

To varying degrees, invasive species take over habitats, outcompeting and displacing native species. The more problematic invasive species are able to invade and dominate multiple habitat types. Some invasive species release chemical compounds that inhibit the germination and/or growth of native seeds and seedlings and thus simplify species diversity and ecosystems. (Complexity adds robustness to ecosystems.) Invasive species are considered one of the top five threats to biodiversity in the province of Ontario (Ontario Ministry of Natural Resources, 2005).

Invasive species established in the NAI study area include European Buckthorn (*Rhamnus cathartica*) in forests, Purple Loosestrife (*Lythrum salicaria*) in wetlands and Common Carp (*Cyprinus carpio*) in rivers and waterways. Invasive forest pests and diseases include the Emerald Ash Borer (*Agrilus planipennis*); a beetle accidentally introduced from Asia causing mortality in all Ash (*Fraxinus* spp.) tree species; Beech Scale (*Cryptococcus fagisuga*), an exotic insect which renders American Beech (*Fagus grandifolia*) trees susceptible to infection by the non-native *Nectria coccinea* var. *faginata* fungus leading to lethal Beech Bark Disease (Hodge *et al.,* 2008); Dutch Elm Disease, a lethal disease of Elm trees caused by a non-native fungus *Ophiostoma novo-ulmi* which is spread by the native Elm Bark Beetle (*Hylurgopinus rufipes*) and the non-native European Elm Bark Beetle (*Scolytus multistriatus*) (*ibid*). Butternut Canker is a lethal disease of Butternut (*Juglans cinerea*) trees caused by the non-native fungus *Sirococcus clavigignenti-juglandacearum* (Hodge *et al*. 2008). It has caused widespread death and decline of Butternut trees through their range.

4.2.5. Climate Change: Climate change is occurring and has caused visible local environmental effects. Temperature changes affect species ranges allowing more southern species to become established farther north. Species that cannot tolerate warmer temperatures must be free to move northward in order to avoid local extinctions. Thus wildlife movement corridors and linked natural areas across the landscape will become increasingly important as terrestrial and aquatic ecosystems are disrupted and/or are modified as a result of climate change. New relationships between species and habitat must be established. Drought is another anticipated effect of climate change. Drought tolerance may become a more important factor in shaping vegetation communities. Stress due to drought may also decrease resistance of species to disease. Drought can also lower water levels which can affect surface water and groundwater availability, changing the type and distribution of wetlands. Lower water levels in streams and rivers may affect fish habitat and spawning success.

Warmer winters are linked to increased insect pest population levels when temperatures do not drop low enough to kill them off. Warmer winter and drought during the winter also affect the amount of ice cover and the amount of snow pack, reducing the insulating capacity of ice and snow and possibly affecting wildlife behaviour over winter. Intense storms increase the risk of flooding events and erosion of stream banks and shorelines, threatening infrastructure such as dams and bridges over waterways and impacting water quality. Storms may damage trees and other vegetation along riverine systems and the lakefront.

4.2.6. Loss of Biodiversity: Loss of biodiversity is a major threat to ecosystem stability and resilience. Habitat loss, degradation of habitat quality (e.g. due to fragmentation and reduction in size of natural patches, pollution, etc.), competition with invasive species, losses to diseases particularly non-native pathogens, climate change effects and other factors all contribute to decreases in biodiversity. Maintenance of linkages between areas of natural habitat and provision for wildlife movement corridors can help to guard against biodiversity loss by allowing for re-population if local extinctions occur. Biodiversity gives strength to ecosystems as more niches are filled and greater complexity allows for more connections in food webs and support for more ecosystem services.

4.3. NATURAL HERITAGE AND ENVIRONMENTAL MANAGEMENT

Governing bodies and the public are becoming more aware of the environmental costs of urbanization and population growth. They are showing increasing concern for the environment, increasing interest in preserving and conserving the natural features that remain, and in mitigating and restoring what has been damaged. These interests and concerns are reflected in legislated and planning efforts.

4.3.1. Provincial Policy Statement (PPS): The PPS provides direction on all matters of provincial interest related to land use planning and development (Ontario Ministry of Municipal Affairs and Housing, 2005a). Among other things, the PPS directs municipalities to protect natural features and areas over the long term, with a focus on natural heritage systems planning that will preserve ecological function, biodiversity and linkages between features. The PPS identifies outright protection of significant features from the impacts of development (significant habitat of endangered and threatened species, significant wetlands, significant coastal wetlands) and requires demonstration of no negative impacts on the natural features or their ecological functions (significant woodlands south and east of the Canadian Shield, significant valleylands south and east of the Canadian Shield, significant wildlife habitat and significant areas of natural and scientific interest).

4.3.2. Niagara Escarpment Plan (NEP): The Niagara Escarpment Plan was established to provide protection to the unique ecological and geological features of the escarpment. As the Niagara Escarpment extends through a variety of Ontario landscapes, the NEP designates seven landuse categories, ranging from natural areas, to intensive urban development and mineral extraction areas. The Escarpment Natural Area designation gives the greatest protection to natural features, followed by the Escarpment Protection Area designation. The Escarpment Rural designation buffers the protected natural areas from the mineral extraction, major and minor urban and recreational designations.

4.3.3. Oak Ridges Moraine Conservation Plan (ORMCP): The Oak Ridges Moraine Conservation Plan was created to guide land use and resource management on the Oak Ridges Moraine, an area of unique environmental, geological and hydrological features that are essential to the well-being of south-central Ontario. The ORMCP recognizes four landuse designations of which the Natural Core Areas and Linkage Areas are most protective of natural features, and are buffered by Countryside Areas from Settlement Areas.

4.3.4. Greenbelt Plan: The Greenbelt Plan includes the protection afforded by the NEP, the ORMCP and the Parkway Belt West Plan and extends protection to additional lands identified as Protected

Countryside. In the Protected Countryside, natural areas are part of the Natural Heritage System that together with a Water Resource System provides a continuous and permanent landbase necessary to support ecological integrity.

4.3.5. Natural Heritage Systems: A watershed natural heritage system has been defined by TRCA and is also being developed by CVC to identify, protect and enhance natural features in the watersheds of the NAI study area. The TRCA *Terrestrial Natural Heritage System Strategy* was developed between 2001 and 2006 and was approved in principle by the TRCA Board in 2007 (Toronto and Region Conservation Authority, 2007a). The Credit Valley Watershed Natural Heritage System is being defined through a four-phase study process. It is currently described in the document *Towards a Natural Heritage System for the Credit River Watershed Phases 1 & 2: Watershed Characterization and Landscape Scale Analysis,* Final Technical Report (Credit Valley Conservation, 2011).

These natural heritage systems are identified and designed at the watershed scale. It is intended that municipal planning authorities can use the watershed natural heritage systems and conservation authority strategies to identify regional and local natural heritage systems, and to review existing natural heritage system policies and strategies in municipal planning documents to enhance the protection of natural heritage features and functions over the long term (Credit Valley Conservation, 2011; Toronto and Region Conservation Authority, 2007a). These watershed natural heritage system srategies have been developed to address the natural heritage policies of the PPS 2005 and conform to provincial plans including the Niagara Escarpment Plan (Niagara Escarpment Commission, 2005, revised 2010), Oak Ridges Moraine Conservation Plan (Ontario Ministry of Municipal Affairs and Housing, 2002), Greenbelt Plan (Ontario Ministry of Municipal Affairs and Housing, 2005b) and the Growth Plan for the Greater Golden Horseshoe (Ontario Ministry for Public Infrastructure and Renewal 2006) (Credit Valley Conservation, 2011; Toronto and Region Conservation Authority, 2007a).

The PPS defines the natural heritage system as: a system of natural heritage features and areas, linked by natural corridors which are necessary to maintain biological and geological diversity, natural functions, viable populations of native species and ecosystems. These systems can include lands that have been restored and areas with the potential to be restored to a natural state. The *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005* (Ontario Ministry of Natural Resources, 2010a), and the previous 1999 edition were created to provide technical guidance to implement the natural heritage policies of the PPS. The guidelines of this manual represent the minimum standard required and planning authorities such as municipalities may choose to go beyond these standards (*ibid*). By implementing natural heritage systems throughout the coverage area the negative affects of past and present urban development will be minimized.

The NAI project contributes to the goal of identifying and refining the natural heritage features throughout the study area.

4.3.6. Region of Peel Greenlands System: The Region of Peel Official Plan (Regional Municipality of Peel, 2008) includes a Greenlands System designed to provide protection for the natural environment (Regional Municipality of Peel, 2008). It consists of Core Areas, Natural Areas and Corridors (NAC) and Potential Natural Areas and Corridors (PNAC). Core Areas are given the highest level of protection to provide uninterrupted natural systems and maximum biodiversity. These areas are protected and are functionally supported, connected and/or buffered by NAC and PNAC areas (*ibid*). The Peel Greenlands System includes Areas of Natural and Scientific Interest (ANSI), Environmentally Significant Areas (ESA), Escarpment Natural Areas and Escarpment Protection Areas identified in the *Niagara Escarpment Plan*, fish and wildlife habitat, endangered and threatened species habitat, wetlands, woodlands, valley and stream corridors, shorelines, natural lakes, natural corridors, groundwater recharge and discharge areas, open space portions of the Parkway Belt West Plan 1978 and other natural features and functional areas (Regional Municipality of Peel, 2008).

4.3.7. Provincially Significant Wetlands (PSW): The Ontario Ministry of Natural Resources has a program to evaluate the significance of wetlands based on a variety of physical, biological and social criteria (Ontario Wetland Evaluation System, 3rd edition). Wetlands may be evaluated individually or as complexes that have related hydrology and that function as a whole. The result of evaluations is the determination that a wetland, or wetland complex, is provincially significant or not. In the past, regional or local significance was determined by the wetland evaluation scores; however this is no longer the case. The significance of other evaluated and/or identified wetlands within municipalities is the responsibility of the regional and/or area municipalities.

The NAI study area includes provincially significant wetlands as well as other wetlands that are not provincially significant. Some wetlands are unevaluated. Development and site alteration are not permitted within PSWs in accordance with the PPS. Policies for protection, development and site alteration and mitigation/compensation for other wetlands are provided in provincial plans, municipal official plans, as well as the conservation authority regulations and policies.

4.3.8. Areas of Natural and Scientific Interest (ANSI): The PPS defines ANSIs as: "areas of land and water containing natural landscapes of features that have been identified as having life science or earth science values related to protection, scientific study or education." Earth science ANSIs contain significant geological features. Life science ANSIs are evaluated on an MNR Ecoregion scale and contain the best natural heritage features and landscapes outside of provincial parks and reserves. Life science ANSIs are selected based on quality and representation of the province's natural heritage. Both Life Science and Earth Science ANSIs are evaluated and identified as provincially or regionally significant.

The NAI coverage area contains both life science and an earth science ANSI's.

4.3.9. Environmentally Significant Areas (ESA): Environmentally Significant Areas (sometimes referred to as Environmentally Sensitive Areas) are identified areas that contain natural features or ecological functions that are significant at a regional scale and are recognized in order to provide protection to them. ESA areas may often coincide at least in part with ANSI boundaries. Conservation Authorities are responsible for identifying ESAs according to a set of criteria. The NAI study area contains ESA's, with those in the Credit River watershed identified by Credit Valley Conservation and those in the watersheds of Etobicoke Creek, Mimico Creek and the Humber River identified by the Toronto and Region Conservation Authority.

4.3.10. Significant Wildlife Habitat (Region of Peel): Significant wildlife habitat is a key natural feature identified for protection under the PPS. Documents such as OMNR's Significant Wildlife Habitat Technical Guide (Ontario Ministry of Natural Resources, 2000) provides technical information on the identification, description and prioritization of significant wildlife habitat. Municipalities were tasked with carrying out the details of putting the PPS directive into effect. Toward this end, the Region of Peel and the Town of Caledon jointly commissioned an analysis of the criteria and thresholds for identifying significant wildlife habitat in their respective jurisdictions (North-South Environmental Inc. *et al.*, 2009) and will consider this analysis when their respective Official Plans are updated. A variety of criteria have been identified that fall into four groupings: seasonal concentration areas, rare vegetation communities or specialized habitat for wildlife, habitats for Species of Conservation Concern and animal movement corridors. Thresholds for determination of significance for many of the criteria have been identified. For some criteria any occurrence is significant and for other criteria too little data exists currently to establish significance thresholds.

5. NAI METHODOLOGY

5.1. DATA COMPILATION FROM EXISTING SOURCES AND NATURAL HERITAGE DATABASE

One of the key objectives of the NAI project is to assemble natural heritage data for the study area into a single location. Available data compilation from existing sources, and its evaluation was conducted prior to initiating any field work, and is also a continuing process. Major inventory-type data sets from a variety of sources were assembled and assessed for currency (data older than 20 years was considered to be outdated), completeness (both taxonomic and geographic) and robustness (generated by knowledgeable professionals or their equivalent).

Examples of inventory-type data sets incorporated into the NAI data set are OMNR ANSI reports, PSW evaluations, species and community data and mapping generated by conservation authorities (CVC, TRCA, Conservation Halton), Mississauga Natural Areas Survey data and mapping; ESA reports and planning-related studies where raw data (i.e. more details than in summary reports) was available. Incidental data is also included in the database however it was not used to assess data gaps.

The NAI data set is inventory in nature, and thus collection of species/community presence data was the main objective. Incidental notation of population size, in particular for uncommon or tracked species, was collected at times but information on population sizes were not consistently collected.

All species data points accepted into the database were required to have a location, date of collection and identified observer associated with each record. Location was required to be ascribed to a natural area. Vegetation community data was required to have an associated polygon shape and the determination of vegetation type that is supported with field data (e.g. description of vegetation layer species composition, cover, height, soils etc).

A Natural Heritage Database has been developed as a product of the NAI project. This is an MS Access database that contains the most complete and most recent NAI data set covering all natural areas in the study area. This database includes all of the data compiled under this project and will serve as a single source for the most up-to-date natural heritage information on natural areas of the Credit River watershed and the Region of Peel, containing both vegetation community and species occurrence data. Direct access to the database is controlled in order protect sensitive data but data requests can be made by contacting CVC. Further work is needed to establish spatial linkage between the database and the GIS (Geographic Information System) that stores the community and natural area shapes.

Data on the presence of aquatic habitat is also of interest to the NAI project. However, at this time, the spatial definition of aquatic habitat differs from how terrestrial habitat is defined, and integration between data on aquatic habitats and the current terrestrial data set of the NAI has not occurred. Further work is needed to link aquatic data sets with terrestrial data sets.

5.2. NAI CORE INVENTORIES

Key inventory types were identified for the assessment of data gaps. These were selected to indicate data-completeness for basic characterization of natural areas.

The NAI core inventories are:

- vegetation communities (ELC)
- vascular plant species
- breeding bird species.

5.3. IDENTIFICATION OF NATURAL AREAS

For the purpose of this project, “natural areas” are defined as areas with natural or naturalizing vegetation communities. In practical terms, the NAI project identifies as “natural”, all community types presented in the Ecological Land Classification guide (Lee *et al*., 1998). Manicured and agricultural areas are excluded, as are non-natural non-vegetated areas. “Cultural communities” have a history of human origin, such as agricultural fields that have been allowed to naturalize or undergo natural succession (forming cultural meadows, cultural thickets, cultural savannahs and cultural woodlands), plantations that are being allowed to undergo natural processes (cultural plantations) and forests that are undergoing non-natural thinning in the form of selective logging (cultural woodlands). While these cultural communities are either currently highly disturbed or have a severe disturbance history, resulting in a potentially atypical appearance or atypical species composition for their location, their value as wildlife habitat is recognized and they are viewed as being in transition back to the natural state, for the purpose of the NAI.

From digital Community Series mapping (derived from air photo interpretation) across the NAI study area, natural areas have been identified as contiguous patches of natural community types. Fig. 10 Natural areas end at boundaries with non-natural land uses, such as standard-width roads, active railway lines, residential/commercial/industrial land use, manicured areas and agricultural fields. All natural areas have been given a unique identifying number (referred to as an NAI number). A natural area may contain one or many different vegetation communities/types. Cultural meadows over 2 ha in size are given their own NAI number, even though they may be contiguous with other natural communities. Cultural meadows less than 2 ha in size are included with the adjacent natural area.

While the initial delineation of natural areas is interpreted (from air photos), mapping generated by field work in a natural area is considered to be more authoritative. The final NAI mapping reconciles interpreted mapping derived from air photo interpretation by field verification.

It should also be noted that the boundaries of natural areas may change with time, due to land use changes and/or naturalization and restoration efforts. Natural cover may be removed to facilitate other land uses and natural cover may also be allowed to re-establish when restoration or natural succession of manicured, agricultural and non-natural non-vegetated areas occurs. The mapping presented in this report is thus, the state of land use and vegetation cover at the time that either the field work was done or when the mapping was generated.

5.4 DATA GAP ANALYSIS

Once all natural areas in the study area were identified, a data gap analysis, based on the compiled existing major data sources, was conducted to determine whether each natural area was data-complete or data-incomplete for each of the three NAI core inventories (vegetation communities, plant species, breeding bird species). To be data-complete, existing data had to fulfill four criteria:

1. Complete taxonomic coverage was possible – the existing data must be inventory, not incidental, in nature and must allow for the potential detection of all species in the targeted taxonomic group (i.e. all vascular plant species or all breeding bird species)
2. Complete geographic coverage - all parts of the natural area were visited within the bounds of where permission to access property was permitted
3. Data is defensible - the observer had to have sufficient expertise to provide highly accurate observations
4. Data is current - the data must be less than 20 years old.

It should be noted that as time passes, an area that was considered to be data-complete could become data-incomplete as the data set ages. Existing data older than 20 years should be re-confirmed or the natural area re-inventoried.

This data gap analysis was used to identify where field work was needed.

5.5 SELECTION OF SITES FOR FIELD WORK

All of the natural areas identified in the study area were assigned to a high, medium or low priority group.

High priority areas included at least part of an ESA or regionally significant Life Science ANSI, were flagged as being a high priority by CVC, TRCA or the municipalities (including the regional municipalities), or were considered by CVC's Terrestrial Ecosystem Enhancement Model (TEEM) to be high-functioning (TEEM score 4-6) at a landscape level. (TEEM rated all natural habitat patches in the Credit River watershed and the Region of Peel on the basis of 6 landscape-scale ecological functions, producing a score for each habitat patch that ranged between 0 and 6. Habitat patches that received TEEM scores over 4 were considered to have the potential to be higher-functioning at the landscape-scale. It should be noted that TEEM score indicates potential function based on landscape metrics and not on field observations.) Well over half of the natural areas fell into the high priority group.

Medium priority areas included all other natural areas with data gaps except for areas that were (largely) included in provincially significant Life Science ANSIs.

Low priority areas included natural areas that fall into provincially significant Life Science ANSIs and data complete areas. Provincially significant Life Science ANSI designation were viewed as providing sufficient protection to natural areas that inventories, where data gaps existed, could be delayed until after more urgently-needed data for other areas had been collected. Due to their status, most provincially significant ANSIs in the study area already had adequate inventory coverage. Data complete natural areas in this low priority grouping would be expected to move up- to higher priority ranking as their data sets aged, so they were not excluded from longer-term inventory efforts.

Over the long term, inventory work would cycle through the high, then medium and then low priority natural areas.

Next, the high priority natural areas were prioritized within their group. For each of these high priority natural areas a score was calculated based on the area's TEEM score (4-6), the regional significance of the area (did it contain a regional Life Science ANSI or an ESA), whether it was flagged as high priority by a conservation authority or municipality, the presence of special features (such as Species At Risk, provincially or regionally rare species or communities, possible old growth forest, interior forest habitat) and whether the area was afforded protection by several plan areas (e.g. Greenbelt Natural Heritage System, some NEP designations, some ORMCP designations). The high priority natural areas were ranked according to their score and site selection proceeded downward from the top of the list. The number of sites selected for field work each year was limited by the estimated amount of field work that could be accomplished by the observer teams for each of the core inventories that had data gaps, and by the access permissions that were received. Private properties make up the largest proportion of many of the natural areas.

The intention of the NAI project is to achieve full data coverage for the NAI core inventories, for all of the high priority areas, and then proceed to undertaking the inventories for the medium priority areas and then the low priority areas.

5.6 FIELD WORK

Field work was conducted only where permission to access properties was obtained. While this results in gaps in coverage for some areas, one of the NAI project's primary principles was and is to respect landowner privacy. At times it was possible to observe species and communities from a distance, and such observations were recorded as long as trespass did not occur. Vegetation

communities usually do not coincide with property boundaries (although they can as a result of land use disturbance history) and if part of a community could be determined from a property with access, the boundary of that community could be extrapolated over the property line to an area not visited, where air photos suggested that the vegetation community was the same.

Some limitations on data collection should be noted. For the most part, data collection was conducted between May and October, during the weekday daylight hours (usually ”working hours”), except breeding bird inventories conducted from approximately first light until noon, and amphibian breeding surveys conducted during spring nights from dark until midnight. These factors may affect species observation as fauna activity may be different in the “off” hours, noise and traffic may be different on weekends, and early-blooming ephemeral plants may not be detectable during this period. Vegetation community surveyors generally made single visits to a natural area, although an extended time period may have been required to cover a large area. The NAI data reflects what is known to occur (species **presence** only) at each natural area and does **not** comment on species **absence**. It is possible that species that actually occur in natural areas were not observed and therefore, were not recorded in the inventory. The NAI methodology has considered the trade-off between increasing data coverage for a single area versus increasing the inventory coverage for many sites across the Credit watershed and Peel region and has attempted to strike a balance in light of the many data gaps across the study area.

5.6.1. Vegetation Community Inventories: Vegetation communities were classified using the OMNR Ecological Land Classification (ELC) for Southern Ontario First Approximation 1998 system, designed to provide a comprehensive, consistent provincial standard approach to describe, inventory and interpret ecosystems (Lee *et al*., 1998). Vegetation communities within the natural areas were classified to vegetation type, the most detailed level of classification in the ELC system. On occasion, there was insufficient data to classify a community beyond the ecosite level (due to insufficient soils data). Field work is necessary to be able to classify communities to ecosite and vegetation type levels.

In the field, vegetation communities were identified, their boundaries determined and the boundaries were mapped onto orthophotos. After field mapping was done, the orthophoto mapping was digitized to generate electronic mapping using GIS. Data was collected on each vegetation community, as per the OMNR ELC card.

During the first two field seasons of the NAI project, 2008 and 2009, some modifications were made to the ELC protocol, in order to cover more natural areas per season. For these years, plant species lists were collected over the whole natural area and not on a per-polygon basis and full determination of all soil characteristics were not mandatory. Sufficient soils data was collected to be able to determine whether the soil was mineral or organic, and if organic, the depth of the organic layer, depth to mottles and/or gley and depth to water table. The guiding principle for soil data collection was to gather enough data to enable accurate classification of the community to the vegetation type level. From 2010 onwards, more soil data was collected, to be able to determine soil texture and moisture regime and plant lists per polygon were recorded (although simply as a list of vascular plant species present, abundance in each vegetation layer not noted). This additional data collection was added in spite of slowing the rate of coverage on the ground, because the view of the NAI data gathering shifted from serving as a trigger for additional more detailed work, to serving as the core data-gathering for a community.

Due to time constraints and the large number of natural areas to be covered, cultural meadows and plantations were generally not included in the field work in 2008 and 2009. This was strictly a logistical decision, not a reflection on the ecological role or importance of cultural communities in the natural heritage landscape. Small cultural meadows and plantation patches surrounded by natural vegetation were included in ELC classification and mapping, and cultural meadows and plantations adjacent to natural communities as well as stand-alone cultural meadows and plantations were set as lower priorities to be addressed at a later date. From 2010 onward, some large cultural meadows were targeted as high priority areas for breeding bird inventories in order to gather data on grassland

bird species. ELC inventories were also done for these grassland areas to provide community context for the breeding bird observations. Also from 2010 onward, plantations are now covered when they are encountered as part of a larger natural area but they are not targeted as stand-alone areas.

5.6.2. Botanical Inventories: Botanical specialists conducted vascular plant inventories at selected sites. These targeted inventories were augmented by flora lists generated by ELC surveyors. The botanical inventories usually involved multiple visits throughout the plant growing season (May to October) to achieve as complete a list as possible. Multiple field visits are desirable as some species, such as spring ephemerals and late-blooming species are only detectable or identifiable at certain times of the growing season.

Botanists covered as much of each natural area as possible, determined by access permission, and cover the full range of habitat types present. Species presence was recorded. When Species At Risk, provincially rare species, regionally rare species (as per Kaiser, 2001) or species tracked by CVC or TRCA were encountered, the location was measured precisely with a GPS unit. Notes on the abundance of the species at that location and GPS accuracy were also recorded.

5.6.3. Breeding Bird Inventories: Ornithologists conducted breeding bird inventories at selected natural areas. During the breeding season from June through mid-July, each natural area was visited twice (except in rare circumstances) with at least one week between visits (to differentiate between migrants and species that were living and potentially breeding at the site). Ornithologists covered as much of each natural area as possible, determined by access permission, recording species presence and the type of breeding evidence. When a Species At Risk, provincially rare species or species tracked by CVC or TRCA was encountered, the territory or nest location was recorded either using a GPS unit (if feasible) or by approximating the position on orthophoto mapping. For probable and confirmed types of breeding evidence, a marked territory indicates the presence of two individuals (a breeding pair) rather than a single individual.

5.6.4. Other Species Records: Fish species records were obtained from fisheries inventory data collected by the conservation authorities, over the past 20 years. Fish observations were made using a variety of techniques including electro-fishing, seining and dip-netting. Fish data collected off-site (i.e. not within the natural area) but within 500 m upstream or downstream of the natural area under consideration were extrapolated to the natural area as long as there were no changes in stream order or size and there were no major barriers that would prevent the movement of fish along the watercourse.

Incidental observations of other fauna, including butterflies/skippers, dragonflies/damselflies, reptiles/amphibians and mammals were also recorded. Occasionally an inventory-type method was used to detect targeted groups of taxa (e.g. road call counts to detect breeding frogs and toads).

5.6.5. Species Nomenclature: Species nomenclature follows the CVC master species list. There are some differences between nomenclature used by CVC and by TRCA, but the CVC list was selected because the NAI data is stored in CVC's Natural Heritage Database and thus the nomenclature used must be compatible with the database. The CVC master species list uses combined nomenclature from the Natural Heritage Information Centre (Natural Heritage Information Centre, 2011), the Integrated Taxonomic Information System (IT IS; Government of Canada, 2011a), the FLORA Ontario - Integrated Botanical Information System (FOIBIS; University of Guelph, 2005) and occasionally other sources. This list is updated periodically as new species are added and taxonomic names are changed.

PART B SITE SUMMARIES AND REFERENCES CITED

1. SITES SELECTED FOR THIS REPORT

One hundred site summaries are presented in this first NAI report volume (Fig. 10, Figs. 11a-d). Currently, NAI data exists for well over 100 sites, although this volume was limited for practical reasons. Generally, the natural areas described in these summaries were visited in the 2008 and/or 2009 NAI field seasons. However, where additional data collection occurred at these sites in 2010, it has been included here as well so that a more complete characterization of the natural area can be presented.

The 100 natural area sites selected for presentation in this report volume were mainly chosen to be representative for various physiographic, conservation and municipal areas. All of the sites had to have sufficient progress toward being data complete to be reportable (although not all are data complete). The data for a few of the summarized sites comes primarily from some of the major data sets that were compiled for the NAI (rather than from NAI field work).

The breakdown of the 100 Volume 1 reporting sites by physiographic region is as follows:

Iroquois Plain	7 sites
Peel Plain	15 sites
South Slope	25 sites
Niagara Escarpment	12 sites
Oak Ridges Moraine	17 sites
Guelph Drumlin Field	10 sites
Horseshoe Moraines	10 sites
Hillsburgh Sandhills	8 sites

* Note that a natural area may fall within more than one physiographic region.

The breakdown of the 100 Volume 1 reporting sites by Conservation Authority is as follows:

CVC	50 sites	1 site in each of subwatersheds 1, 2, 3, 5, 6	
		2 sites in each of subwatersheds 8, 14, 21	
		3 sites in subwatershed 20	
		4 sites in each of subwatersheds 10, 12, 13, 19	
		5 sites in each of subwatersheds 9, 11, 18	
		6 sites in each of subwatersheds 16, 17	
		10 sites in subwatershed 15	
TRCA	50 sites	Etobicoke Creek watershed	20 sites
		Humber River watershed	29 sites
		Mimico Creek watershed	1 site

* Note that a natural area may fall within more than one watershed or subwatershed.

The breakdown of the 100 Volume 1 reporting sites by Regional municipality is as follows:

Region of Peel	80 sites
Halton Region	9 sites
Wellington County	8 sites
Dufferin County	3 sites

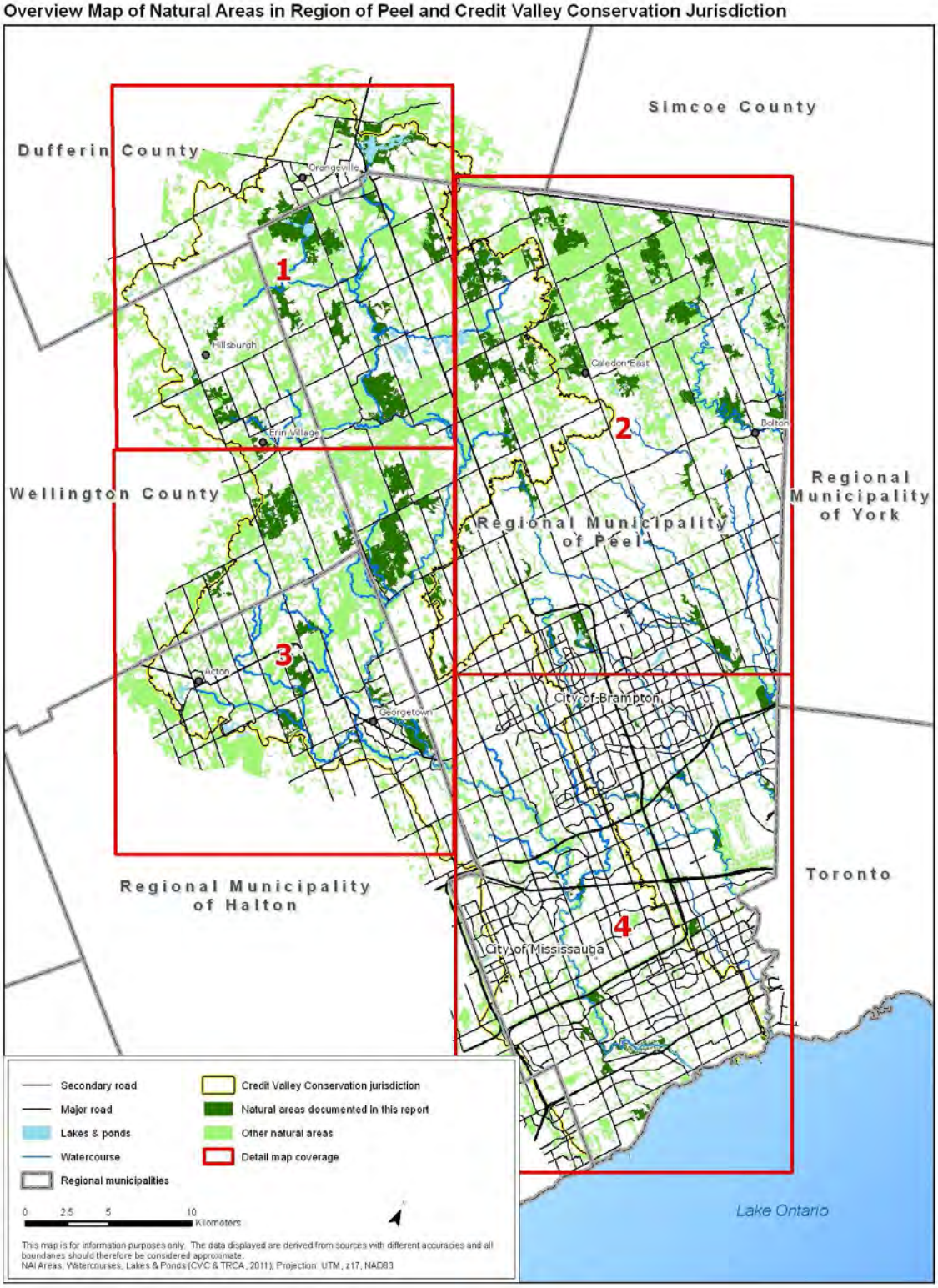
The breakdown of the 100 Volume 1 reporting sites by Municipality is as follows:

City of Brampton	15 sites
Town of Caledon	51 sites
City of Mississauga	14 sites
Town of Halton Hills	9 sites
Township of East Garafraxa	2 sites
Town of Mono	2 sites
Town of Orangeville	1 site
Town of Erin	8 sites

* Note that a natural area may fall into more than one municipality.

Figure 10

Overview Map of Natural Areas in Region of Peel and Credit Valley Conservation Jurisdiction



2. SITE LOCATOR MAPS

Figure 11a

Natural Areas in Map 1 Extent (North Credit River)

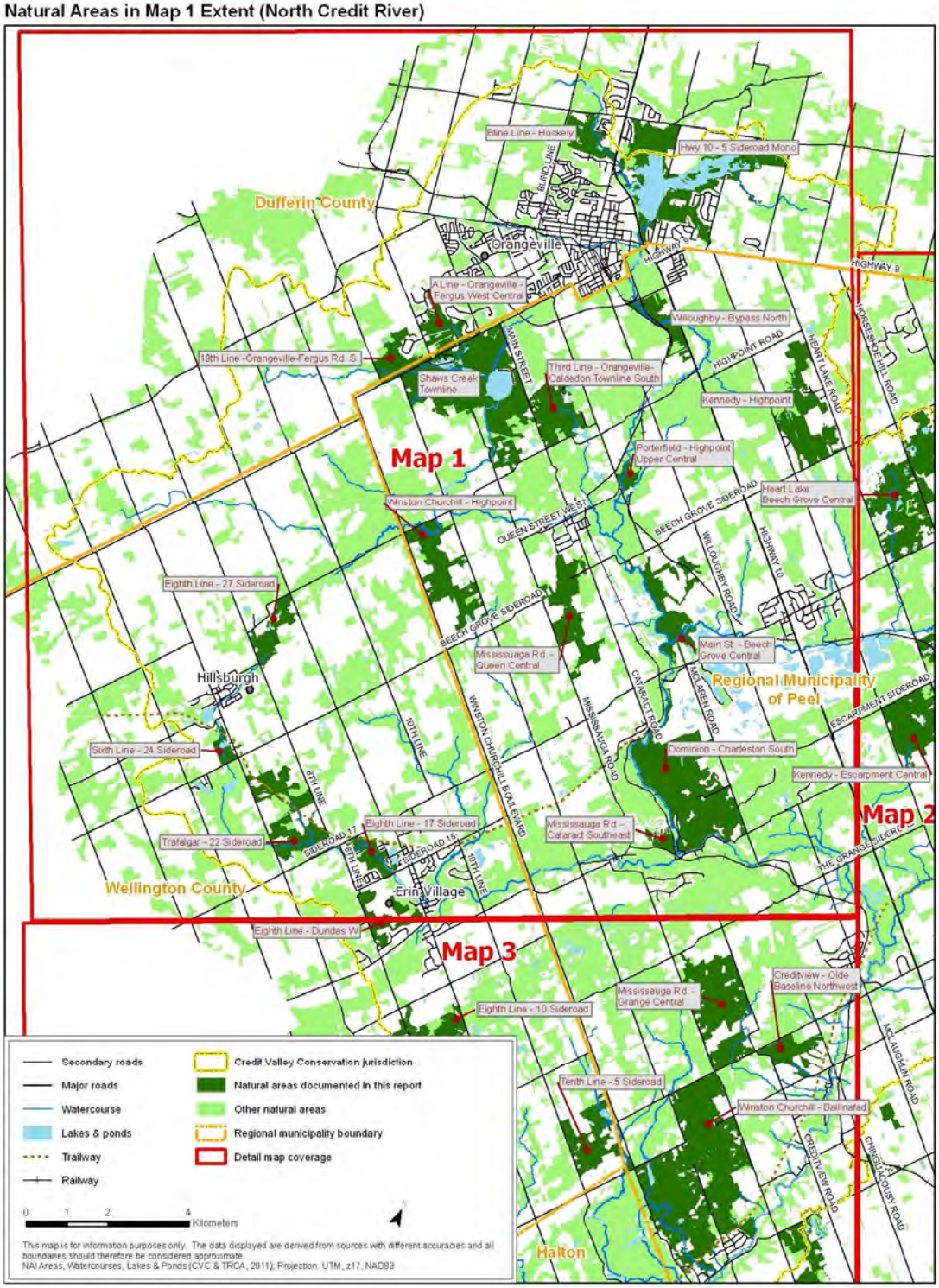


Figure 11b

Natural Areas in Map 2 Extent (North Peel Region)

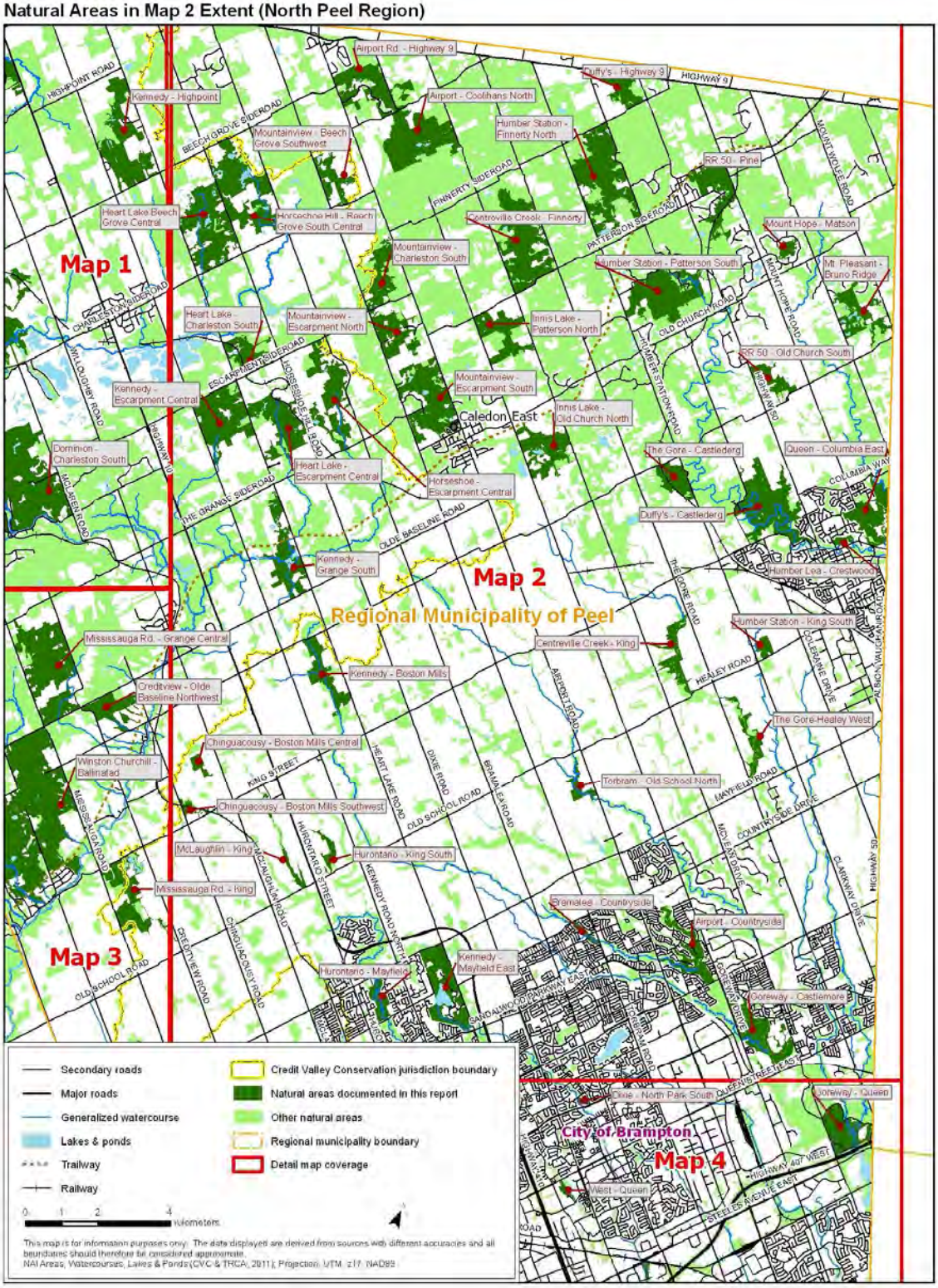


Figure 11c

Natural Areas in Map 3 Extent (West Credit Valley Conservation Jurisdiction)

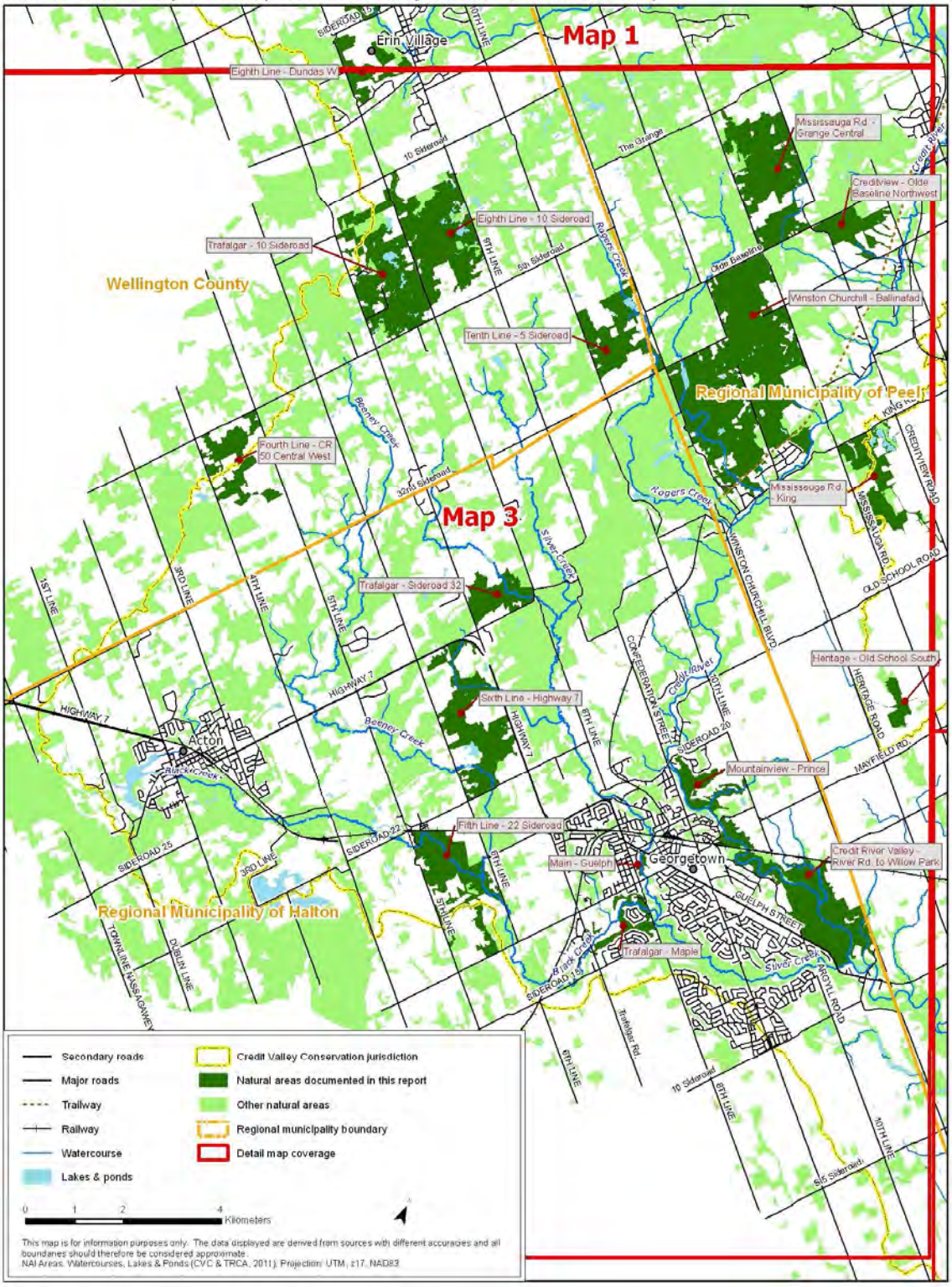
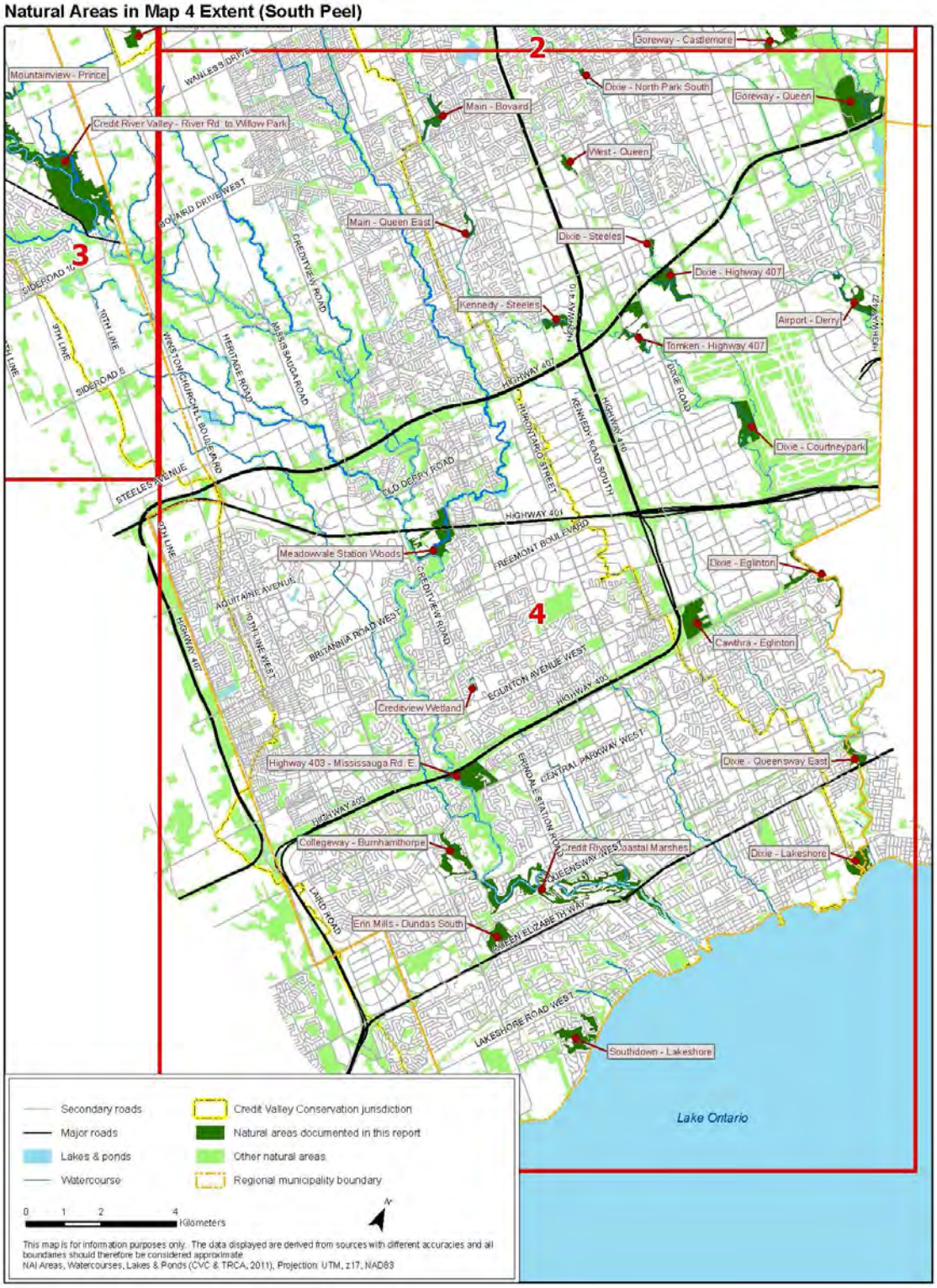


Figure 11d


Natural Areas in Map 4 Extent (South Peel)
2
3
4
Goreway - Castlemore
Mountainview - Prince
Dixie - North Park South
Goreway - Queen
Main - Bovaird
Credit River Valley - River Rd to Willow Park
West - Queen
Main - Queen East
Dixie - Steeles
Dixie - Highway 407
Kennedy - Steeles
Airport - Derry
Tomken - Highway 407
Dixie - Courtneypark
Meadowvale Station Woods
Dixie - Eglinton
Cawthra - Eglinton
Creditview Wetland
Highway 403 - Mississauga Rd. E
Dixie - Queensway East
Collegeway - Burnhamthorpe
Credit River Coastal Marshes
Dixie - Lakeshore
Erin Mills - Dundas South
Southdown - Lakeshore
Lake Ontario
Secondary roads
Major roads
Lakes & ponds
Watercourse
Credit Valley Conservation jurisdiction
Natural areas documented in this report
Other natural areas
Regional municipality boundary
0 1 2 4 Kilometers
This map is for information purposes only. The data displayed are derived from sources with different accuracies and all boundaries should therefore be considered approximate
NAI Areas, Watercourses, Lakes & Ponds (CVC & TRCA, 2011), Projection: UTM, z17, NAD83

3. LIST OF NAI SITE NAMES AND AREA NUMBERS

The following look-up lists for site name and NAI number apply to sites summarized in this report volume.

3.1. LOOK-UP NATURAL AREAS BY SITE NAME

Sitename	NAI Number(s)
19 Line - Orangeville-Fergus Rd South	123
A Line - Orangeville-Fergus Rd West-Central	143
Airport - Coolihans North	9646
Airport - Countryside	2274, 2557, 2647
Airport - Derry	3982, 4385, 4388
Airport Rd - Highway 9	9476
Blind Line - Hockley	264
Bramalea - Countryside	2233, 2240
Cawthra - Eglinton	3710, 3754, 4417
Centreville Creek - Finnerty	9643
Centreville Creek - King	8731
Chinguacousy - Boston Mills Central	8171
Chinguacousy - Boston Mills Southwest	8119, 8128
Collegeway - Burnhamthorpe	3267, 3293
Credit River Coastal Marshes	3255, 3274, 3276, 3291, 3296, 3297, 3301, 3304, 3317, 3327, 3329, 3330, 3341, 3342, 3344, 3345, 3346, 3348, 3364, 3375, 4128, 4129
Credit River Valley - River Road to Willow Park	7375, 7501
Creditview - Olde Base Line Northwest	8204
Creditview - Queen	1123
Creditview Wetland	3522
Dixie - Courtneypark	3890, 3910, 3918, 4025, 4316, 4320, 4342
Dixie - Eglinton	3812, 3838, 3854, 4022, 4421
Dixie - Highway 407	1304, 1320, 2449, 2625, 3961
Dixie - Lakeshore	3524, 3526, 4177
Dixie - North Park South	2082
Dixie - Queensway East	3672
Dixie - Steeles	1336, 2455
Dominion - Charleston South	8424,8437, 8447, 8453, 8463, 8466, 8468, 8474, 8485, 8494, 8503, 9585, 9673, 9871, 9872, 9873, 9881, 9885, 10389
Duffy's - Castlederg	9617
Duffy's - Highway 9	9539
Eighth Line - 10 Sideroad	6489
Eighth Line - 17 Sideroad	6497
Eighth Line - 27 Sideroad	6507
Eighth Line - Dundas W	6273
Eldorado Park and Area	1104, 2354
Erin Mills - Dundas South	3199, 4403
Fifth Line - 22 Sideroad	7497
Fourth Line - CR50 Central West	6476

Sitename	NAI Number(s)
Goreway - Castlemore	2161, 2209, 2212, 2215, 2221, 2222, 2223, 2224, 2226, 2229, 2231, 2232, 2234, 2357, 2533, 2536, 2542, 2640, 2645
Goreway - Queen	2121, 2136, 2142, 2145, 2147, 2148, 2154, 2165, 2170, 2175, 2179, 2369, 2521, 2637, 2639, 2641
Heart Lake - Beech Grove Central	9622
Heart Lake - Charleston South	9598, 10038, 10040
Heart Lake - Escarpment Central	9593
Heritage - Old School South	8005
Highway 10 - 5 Sideroad Mono	203, 210, 219, 227, 228, 239, 242, 256, 265, 267, 268, 276, 279, 308, 403, 419, 498, 503, 515
Highway 403 - Mississauga Rd East	3406, 4142
Horseshoe Hill - Beech Grove South Central	9128, 9631
Horseshoe Hill - Escarpment Central	9603
Humber Lea - Crestwood	9032
Humber Station - Finnerty North	9652
Humber Station - King South	8746
Humber Station - Patterson South	9645
Hurontario - King South	8152
Hurontario - Mayfield	2075, 2088, 2089, 2096, 2495, 2634
Innis Lake - Old Church North	8958
Innis Lake - Patterson North	9625
Kennedy - Boston Mills	8376
Kennedy - Escarpment Central	9592
Kennedy - Grange South	8515
Kennedy - Highpoint	9261
Kennedy - Mayfield East	2105, 2358, 2365
Kennedy - Steeles	1221, 1224, 2423, 2426, 2428, 2439
Main - Bovaird	1353, 1358, 1370, 1375, 1378, 2459, 2629
Main - Guelph	7339
Main - Queen East	1278
Main St - Beech Grove Central	8784
McLaughlin - King	8125
Meadowvale Station Woods	3709, 3728
Mississauga Rd - Cataract Southeast	8346
Mississauga Rd - Grange Central	9577
Mississauga Rd - King	9568
Mississauga Rd - Queen Central	8693
Mount Hope - Matson	9478
Mountainview - Beech Grove Southwest	9636
Mountainview - Charleston South	9627
Mountainview - Escarpment North	9615
Mountainview - Escarpment South	9610
Mountainview - Prince	7505
Mt. Pleasant - Bruno Ridge	9648
Porterfield - Highpoint Upper Central	8915, 8919
Queen - Columbia East	9619
RR50 - Old Church South	9282
RR50 - Pine	9506
Shaws Creek - Townline	9045, 9606, 9702, 9704

Sitename	NAI Number(s)
Sixth Line - 24 Sideroad	6336, 6523
Sixth Line - Highway 7	7409
Southdown - Lakeshore	4007, 4013
Tenth Line - 5 Sideroad South	6488
The Gore - Castlederg	9607, 9612
The Gore - Healey West	8529, 8557
Third Line - Orangeville/Caledon Townline South	9609
Tomken - Highway 407	1238, 1247, 1254, 1258, 2433, 2620, 2622, 3934
Torbram - Old School North	8363
Trafalgar - 10 Sideroad	6487
Trafalgar - 22 Sideroad	6498
Trafalgar - Maple	7302
Trafalgar - Sideroad 32	7449
West - Queen	1384
Willoughby - Bypass North	9228, 9628
Winston Churchill - Ballinafad	8050
Winston Churchill - Highpoint	9590

3.2 LOOK-UP NATURAL AREAS BY AREA NUMBER

NAI Number	Sitename
123	19 Line - Orangeville-Fergus Rd South
143	A Line - Orangeville-Fergus Rd West-Central
203	Highway 10 - 5 Sideroad Mono
210	Highway 10 - 5 Sideroad Mono
219	Highway 10 - 5 Sideroad Mono
227	Highway 10 - 5 Sideroad Mono
228	Highway 10 - 5 Sideroad Mono
239	Highway 10 - 5 Sideroad Mono
242	Highway 10 - 5 Sideroad Mono
256	Highway 10 - 5 Sideroad Mono
264	Blind Line - Hockley
265	Highway 10 - 5 Sideroad Mono
267	Highway 10 - 5 Sideroad Mono
268	Highway 10 - 5 Sideroad Mono
276	Highway 10 - 5 Sideroad Mono
279	Highway 10 - 5 Sideroad Mono
308	Highway 10 - 5 Sideroad Mono
403	Highway 10 - 5 Sideroad Mono
419	Highway 10 - 5 Sideroad Mono
498	Highway 10 - 5 Sideroad Mono
503	Highway 10 - 5 Sideroad Mono
515	Highway 10 - 5 Sideroad Mono
1104	Eldorado Park and Area
1123	Creditview - Queen
1221	Kennedy - Steeles
1224	Kennedy - Steeles

NAI Number	Sitename
1238	Tomken - Highway 407
1247	Tomken - Highway 407
1254	Tomken - Highway 407
1258	Tomken - Highway 407
1278	Main - Queen East
1304	Dixie - Highway 407
1320	Dixie - Highway 407
1336	Dixie - Steeles
1353	Main - Bovaird
1358	Main - Bovaird
1370	Main - Bovaird
1375	Main - Bovaird
1378	Main - Bovaird
1384	West - Queen
1455	Dixie - Steeles
2075	Hurontario - Mayfield
2082	Dixie - North Park South
2088	Hurontario - Mayfield
2089	Hurontario - Mayfield
2096	Hurontario - Mayfield
2105	Kennedy - Mayfield East
2121	Goreway - Queen
2136	Goreway - Queen
2142	Goreway - Queen
2145	Goreway - Queen
2147	Goreway - Queen
2148	Goreway - Queen
2154	Goreway - Queen
2161	Goreway - Castlemore
2165	Goreway - Queen
2170	Goreway - Queen
2175	Goreway - Queen
2179	Goreway - Queen
2209	Goreway - Castlemore
2212	Goreway - Castlemore
2215	Goreway - Castlemore
2221	Goreway - Castlemore
2222	Goreway - Castlemore
2223	Goreway - Castlemore
2224	Goreway - Castlemore
2226	Goreway - Castlemore
2231	Goreway - Castlemore
2232	Goreway - Castlemore
2233	Bramalea - Countryside
2234	Goreway - Castlemore
2240	Bramalea - Countryside
2274	Airport - Countryside
2354	Eldorado Park and Area
2357	Goreway - Castlemore
2358	Kennedy - Mayfield East
2365	Kennedy - Mayfield East

NAI Number	Sitename
2369	Goreway - Queen
2423	Kennedy - Steeles
2426	Kennedy - Steeles
2428	Kennedy - Steeles
2433	Tomken - Highway 407
2439	Kennedy - Steeles
2449	Dixie - Highway 407
2459	Main - Bovaird
2495	Hurontario - Mayfield
2521	Goreway - Queen
2533	Goreway - Castlemore
2536	Goreway - Castlemore
2542	Goreway - Castlemore
2557	Airport - Countryside
2620	Tomken - Highway 407
2622	Tomken - Highway 407
2625	Dixie - Highway 407
2629	Main - Bovaird
2634	Hurontario - Mayfield
2637	Goreway - Queen
2639	Goreway - Queen
2640	Goreway - Castlemore
2641	Goreway - Queen
2645	Goreway - Castlemore
2647	Airport - Countryside
3199	Erin Mills - Dundas South
3255	Credit River Coastal Marshes
3267	Collegeway - Burnhamthorpe
3274	Credit River Coastal Marshes
3276	Credit River Coastal Marshes
3291	Credit River Coastal Marshes
3293	Collegeway - Burnhamthorpe
3296	Credit River Coastal Marshes
3297	Credit River Coastal Marshes
3301	Credit River Coastal Marshes
3304	Credit River Coastal Marshes
3317	Credit River Coastal Marshes
3327	Credit River Coastal Marshes
3329	Credit River Coastal Marshes
3330	Credit River Coastal Marshes
3341	Credit River Coastal Marshes
3342	Credit River Coastal Marshes
3344	Credit River Coastal Marshes
3345	Credit River Coastal Marshes
3346	Credit River Coastal Marshes
3348	Credit River Coastal Marshes
3364	Credit River Coastal Marshes
3375	Credit River Coastal Marshes
3406	Highway 403 - Mississauga Rd East
3522	Creditview Wetland
3524	Dixie - Lakeshore

NAI Number	Sitename
3526	Dixie - Lakeshore
3672	Dixie - Queensway East
3709	Meadowvale Station Woods
3710	Cawthra - Eglinton
3728	Meadowvale Station Woods
3754	Cawthra - Eglinton
3812	Dixie - Eglinton
3838	Dixie - Eglinton
3854	Dixie - Eglinton
3890	Dixie - Courtneypark
3910	Dixie - Courtneypark
3918	Dixie - Courtneypark
3934	Tomken - Highway 407
3961	Dixie - Highway 407
3982	Airport - Derry
4007	Southdown - Lakeshore
4013	Southdown - Lakeshore
4022	Dixie - Eglinton
4025	Dixie - Courtneypark
4128	Credit River Coastal Marshes
4129	Credit River Coastal Marshes
4142	Highway 403 - Mississauga Rd East
4177	Dixie - Lakeshore
4316	Dixie - Courtneypark
4320	Dixie - Courtneypark
4342	Dixie - Courtneypark
4385	Airport - Derry
4388	Airport - Derry
4403	Erin Mills - Dundas South
4417	Cawthra - Eglinton
4421	Dixie - Eglinton
6273	Eighth Line - Dundas W
6336	Sixth Line - 24 Sideroad
6476	Fourth Line - CR50 Central West
6487	Trafalgar - 10 Sideroad
6488	Tenth Line - 5 Sideroad South
6489	Eighth Line - 10 Sideroad
6497	Eighth Line - 17 Sideroad
6498	Trafalgar - 22 Sideroad
6507	Eighth Line - 27 Sideroad
6523	Sixth Line - 24 Sideroad
7302	Trafalgar - Maple
7339	Main - Guelph
7375	Credit River Valley - River Road to Willow Park
7409	Sixth Line - Highway 7
7449	Trafalgar - Sideroad 32
7497	Fifth Line - 22 Sideroad
7501	Credit River Valley - River Road to Willow Park
7505	Mountainview - Prince
8005	Heritage - Old School South
8050	Winston Churchill - Ballinafad

NAI Number	Sitename
8119	Chinguacousy - Boston Mills Southwest
8125	McLaughlin - King
8128	Chinguacousy - Boston Mills Southwest
8152	Hurontario - King South
8171	Chinguacousy - Boston Mills Central
8204	Creditview - Olde Base Line Northwest
8346	Mississauga Rd - Cataract Southeast
8363	Torbram - Old School North
8376	Kennedy - Boston Mills
8424	Dominion - Charleston South
8437	Dominion - Charleston South
8447	Dominion - Charleston South
8453	Dominion - Charleston South
8463	Dominion - Charleston South
8466	Dominion - Charleston South
8468	Dominion - Charleston South
8474	Dominion - Charleston South
8485	Dominion - Charleston South
8494	Dominion - Charleston South
8503	Dominion - Charleston South
8515	Kennedy - Grange South
8529	The Gore - Healey West
8557	The Gore - Healey West
8693	Mississauga Rd - Queen Central
8731	Centreville Creek - King
8746	Humber Station - King South
8784	Main St - Beech Grove Central
8915	Porterfield - Highpoint Upper Central
8919	Porterfield - Highpoint Upper Central
8958	Innis Lake - Old Church North
9032	Humber Lea - Crestwood
9045	Shaws Creek - Townline
9128	Horseshoe Hill - Beech Grove South Central
9228	Willoughby - Bypass North
9261	Kennedy - Highpoint
9282	RR50 - Old Church South
9476	Airport Rd - Highway 9
9478	Mount Hope - Matson
9506	RR50 - Pine
9539	Duffy's - Highway 9
9568	Mississauga Rd - King
9577	Mississauga Rd - Grange Central
9585	Dominion - Charleston South
9590	Winston Churchill - Highpoint
9592	Kennedy - Escarpment Central
9593	Heart Lake - Escarpment Central
9598	Heart Lake - Charleston South
9603	Horseshoe Hill - Escarpment Central
9606	Shaws Creek - Townline
9607	The Gore - Castlederg
9609	Third Line - Orangeville/Caledon Townline South

NAI Number	Sitename
9610	Mountainview - Escarpment South
9612	The Gore - Castlederg
9615	Mountainview - Escarpment North
9617	Duffy's - Castlederg
9619	Queen - Columbia East
9622	Heart Lake - Beech Grove Central
9625	Innis Lake - Patterson North
9627	Mountainview - Charleston South
9628	Willoughby - Bypass North
9631	Horseshoe Hill - Beech Grove South Central
9636	Mountainview - Beech Grove Southwest
9643	Centreville Creek - Finnerty
9645	Humber Station - Patterson South
9646	Airport - Coolihans North
9648	Mt. Pleasant - Bruno Ridge
9652	Humber Station - Finnerty North
9673	Dominion - Charleston South
9702	Shaws Creek - Townline
9704	Shaws Creek - Townline
9871	Dominion - Charleston South
9872	Dominion - Charleston South
9873	Dominion - Charleston South
9881	Dominion - Charleston South
9885	Dominion - Charleston South
10038	Heart Lake - Charleston South
10040	Heart Lake - Charleston South
10389	Dominion - Charleston South

4. DATA ON NATURAL AREAS NOT SUMMARIZED IN THIS REPORT VOLUME

Inventory data exists for additional natural areas that are not covered in this report volume. Summaries for these other natural areas will be included in future NAI report volumes but in the meantime, the data is available by contacting Credit Valley Conservation or Toronto and Region Conservation Authority, depending on the location of the area. Figures 12, 13 and 14 show natural areas respectively, where vegetation community inventory data, botanical inventory data and breeding bird inventory data exists in the NAI study area.

Figure 12

Existing NAI Vegetation Community Inventory Data Coverage

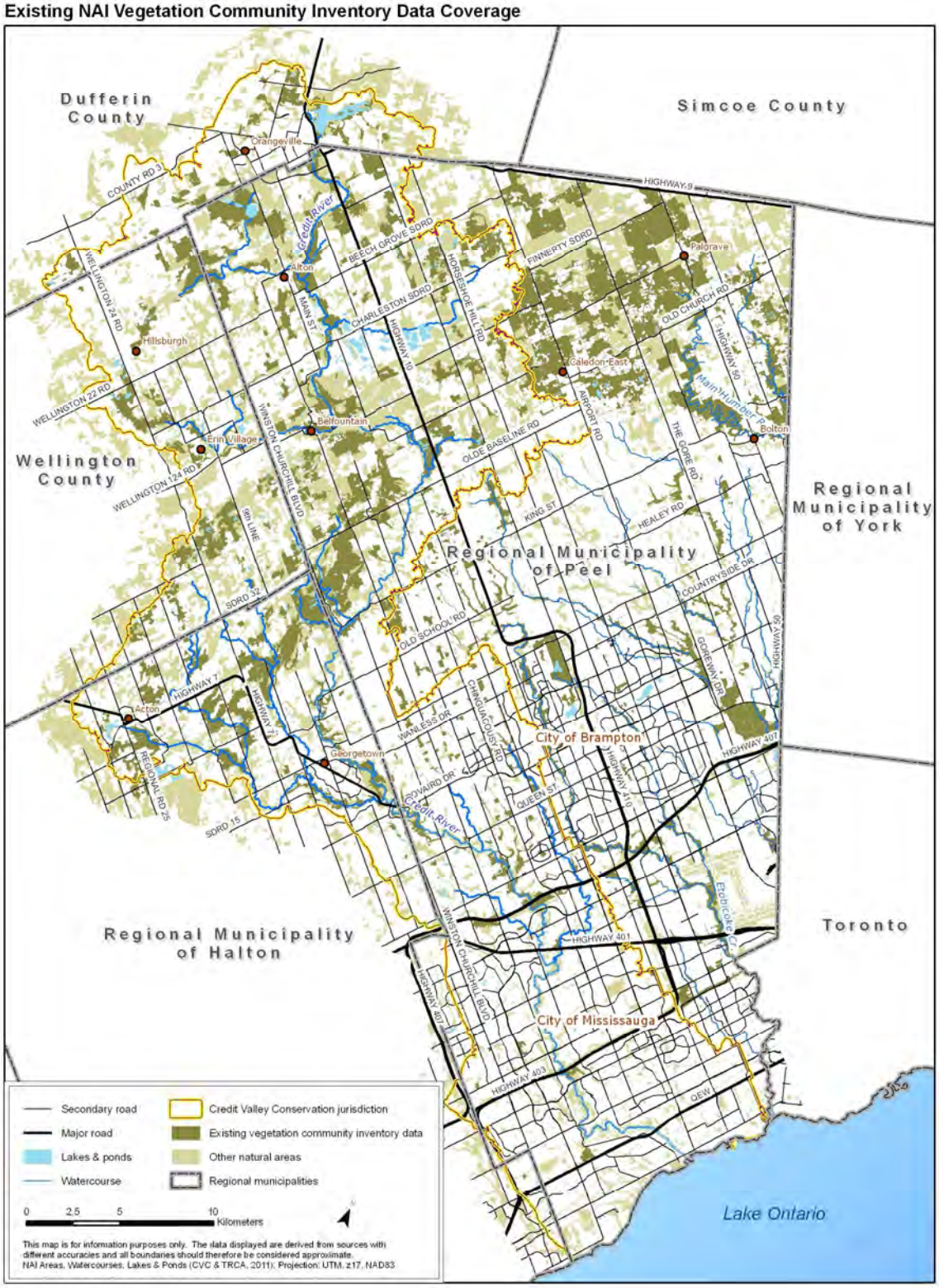


Figure 13

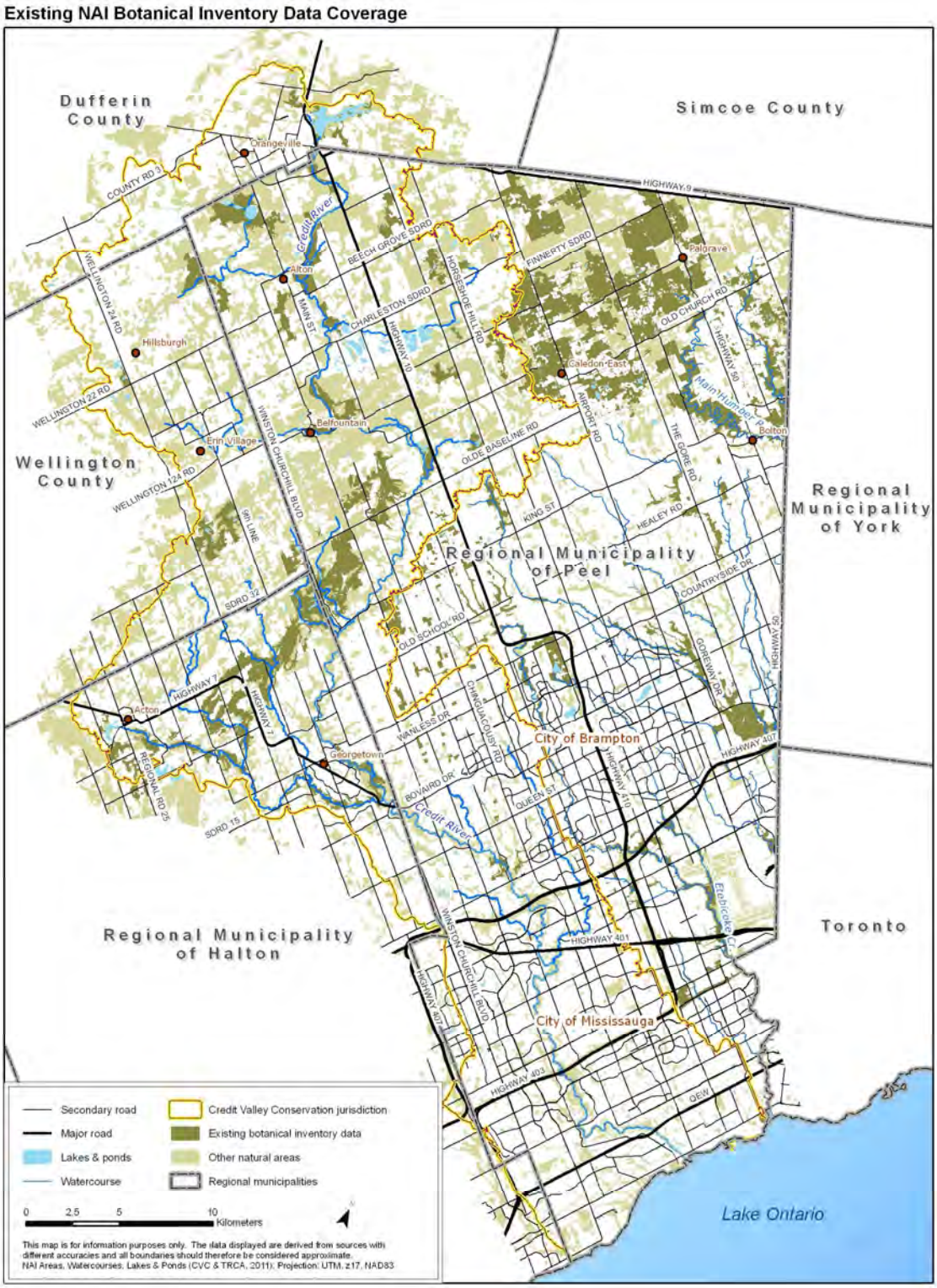
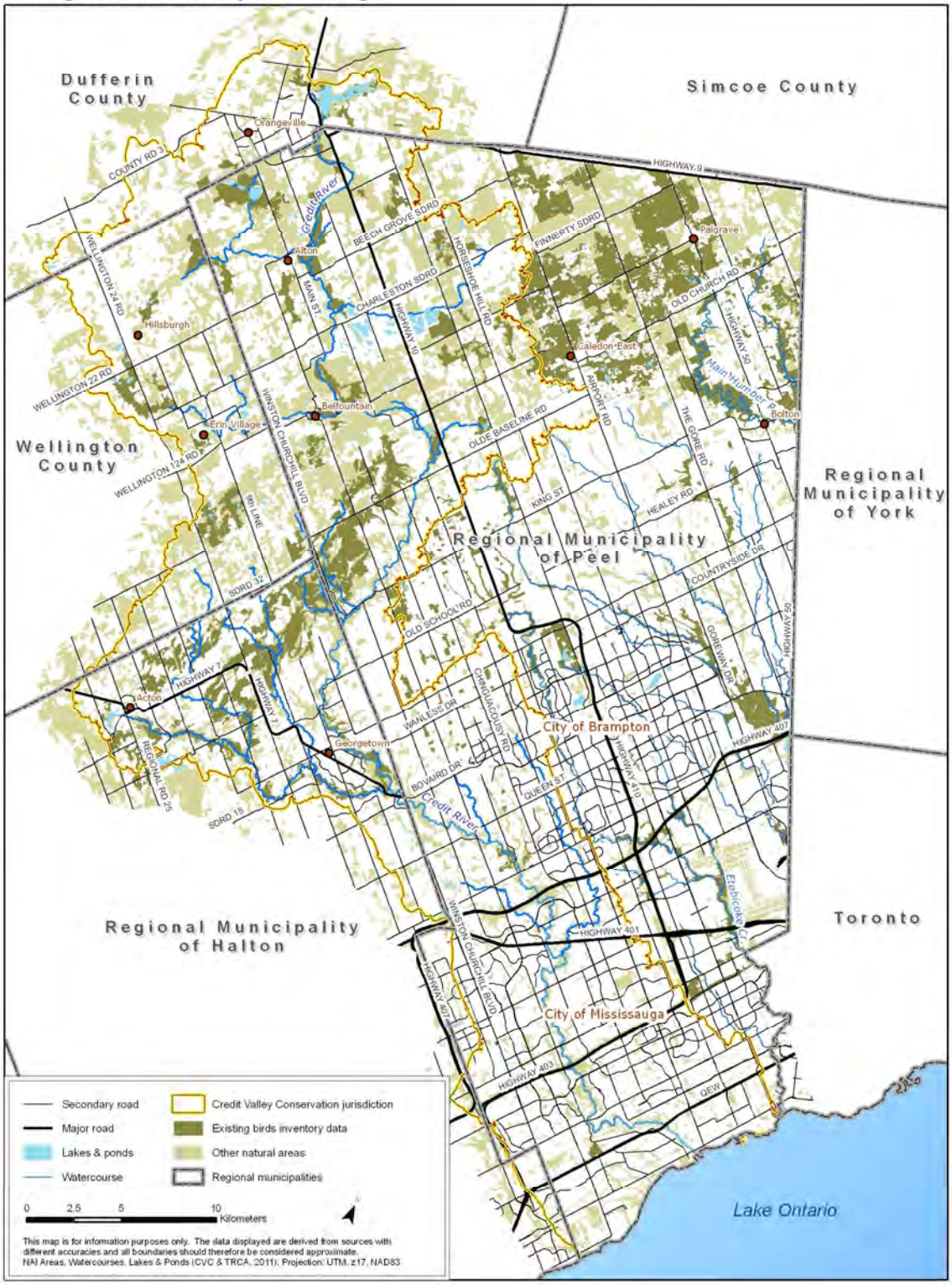

Existing NAI Botanical Inventory Data Coverage
Dufferin County
Simcoe County
Wellington County
Regional Municipality of York
Regional Municipality of Peel
Regional Municipality of Halton
Toronto
City of Brampton
City of Mississauga
Lake Ontario
Orangeville
Alton
Hillsburgh
Erin Village
Belfountain
Caledon East
Palgrave
Bolton
Acton
Georgetown
Credit River
Main Humber R.
Etobicoke Cr.
HIGHWAY 9
COUNTY RD 3
WELLINGTON 24 RD
WELLINGTON 22 RD
WELLINGTON 124 RD
BEECH GROVE SDRD
CHARLESTON SDRD
HIGHWAY 10
MAIN ST
HORSESHOE HILL RD
FINNERTY SDRD
OLD CHURCH RD
HIGHWAY 50
NIRPORT RD
THE GORE RD
OLDE BASELINE RD
KING ST
HEALEY RD
WINSTON CHURCHILL BLVD
6th LINE
SDRD 32
COUNTRYSIDE DR
OLD SCHOOL RD
CORBEAN DR
HIGHWAY 7
HIGHWAY 1
WANLESS DR
CHINGUACOUSY RD
BOVAIRD DR
QUEEN ST
HIGHWAY 410
HIGHWAY 407
REGIONAL RD 25
SDRD 15
HIGHWAY 401
HIGHWAY 403
QEW
Secondary road
Major road
Lakes & ponds
Watercourse
Credit Valley Conservation jurisdiction
Existing botanical inventory data
Other natural areas
Regional municipalities
0 2.5 5 10 Kilometers
This map is for information purposes only. The data displayed are derived from sources with different accuracies and all boundaries should therefore be considered approximate.
NAI Areas, Watercourses, Lakes & Ponds (CVC & TRCA, 2011); Projection: UTM, z17, NAD83

Figure 14

Existing NAI Birds Inventory Data Coverage



5. NOTES ON THE SITE SUMMARIES

The site summaries contain site-specific information to capture the individual character of each natural area.

5.1. SITE NAME

The NAI project uses a compound location-naming convention based on the roads adjacent to the NAI site. The first part of the site name indicates the concession road that runs along the southwest margin of the block that contains the natural area and the second part of the site name indicates the sideroad that runs along the northwest side of the concession block that contains the natural area. (It should be noted that in the study area, concession roads generally run northwest-southeast and sideroads generally run northeast-southwest.) Thus the natural area lies in the concession block immediately east of the identified corner. The NAI site name may also have a third part that refines the location in the concession block where the natural area occurs, such as “north”, “central”, “west-central” dependent on the number and distribution of other natural areas that may be located in the same concession block. A locator map for the natural area can be found at the end of each site summary. In urban areas, major northwest-southeast and northeast-southwest roads are used to name sites instead of concession roads and sideroads.

5.2. NATURAL AREA NUMBER

Each site has one or more unique natural area numbers assigned. A site with multiple numbers represents a cluster of adjacent field, forest and/or aquatic natural areas. The natural area number is an internal reference system within the natural heritage database and can be used for data requests.

5.3. NATURAL AREA SIZE

Natural Area size is expressed in hectares, rounded off to a whole number.

5.4. HUMAN HISTORY

A brief overview is provided of historical land uses in the vicinity of the natural area. This is not intended to relate the full human history of the site but provides insight into historical natural communities that may have been present and/or the disturbance history of the area.

5.5. VEGETATION COMMUNITIES

The first part of this section describes the general community types that make up the natural area. Broad community types are grouped together, for example all deciduous forests are grouped together, all types of coniferous swamps are grouped together. For areas with 100% ELC coverage, the percent composition of all communities of each broad community type (community series) are summed. For areas that have only partial ELC coverage, field generated community data is used where it is known and the remainder is calculated from the interpreted (from air photos) community series mapping. In this way a general picture of community composition of the whole natural area is provided, although there is the potential for some inaccuracy due to the difficulty of interpreting air photos for some community types.

The second part of this section provides the results of the ELC field data that has been collected for the portion of the natural area where access permission was obtained. All of the known vegetation types for the natural area are listed, including their area and percent contribution to the whole natural

area. Note that these vegetation communities may not total to 100% of the natural area if complete ELC coverage was not obtained. The ELC mapping for each natural area can be found at the end of each site summary.

Natural areas may sometimes contain distinct vegetation communities that are too small to map individually, and are treated as “inclusions” within the surrounding vegetation type. Inclusions are classified using the ELC system (according to their dominant species and soils) but are listed instead of being mapped. If rare inclusions have been found they are listed in this section.

There are examples where a vegetation community may actually be a mosaic of two distinct vegetation types that are recognizable but are intermixed in too complex a manner to map. These are recorded as “complexes” and the vegetation type of each component is classified according to the ELC system and the dominant vegetation type is noted. When a rare vegetation type is part of a complex it is listed in this section.

5.6. SPECIES PRESENCE

This section summarizes the species observations by general taxonomic group (plants, breeding birds, fish, etc.) where at least one record for a group exists. The inventory work was more exhaustive in detecting some groups (e.g. plant species, breeding birds) than others due to the methodology employed. Some groups are only represented by incidental records. Species At Risk that were encountered are listed in a table with their ranks. The column with the MNR heading shows the species designation under SARO. A second table lists regionally rare species (note that regional rarity ranks are currently only available for vascular plant species). For sites within CVC’s jurisdiction (i.e. Credit River watershed) all of the species listed in this table are regionally rare. For sites within TRCA’s jurisdiction (i.e. Etobicoke Creek, Mimico Creek and Humber River watersheds), the second table also lists TRCA regional Species of Conservation Concern (see Species Rarity section below for explanation of TRCA L-ranks). When regional rarity and TRCA L-ranked species are both listed in the same table, bold type is used to indicate the species that are regionally rare and regular type with an indication in the column for L-rank indicates species that are of conservation concern as per TRCA. When a species is both regionally rare and of TRCA conservation concern, it is written in bold type with an L-ranking.

5.7. DATA-SENSITIVE SPECIES

Species deemed “data-sensitive” by the NAI project are not specifically named in this report. Instead, the site summary indicates that a data-sensitive species is present. Additional information will be released on a “need to know” basis. The Data Management Technician at CVC or TRCA can be contacted for more information (depending on Conservation Authority jurisdiction of the site). Data-sensitive species are species for which the publication of their locations would pose a high threat to the viability of the populations. Often these species are targeted for harvesting.

5.8. SPECIES AT RISK

Species described as national Species At Risk are those designated Endangered, Threatened or Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; Committee on the Status of Endangered Wildlife in Canada, 2010). COSEWIC is an independent body of experts responsible for identifying and assessing species considered to be at risk on a national basis, and which recommends species for protection under the federal Species At Risk Act (SARA; Government of Canada, 2011b). Species are not legally protected by COSEWIC, but COSEWIC’s recommendation is the first step in the process of legal protection under SARA.

Species described in this report as provincial Species At Risk are those classified as Endangered, Threatened or Special Concern by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO analyses the best available information, classifies species status in Ontario and reports their assessments to the Ministry of Natural Resources. Species identified as being at risk are placed on the Species at Risk in Ontario (SARO; Ontario Ministry of Natural Resources, 2010b) list and receive protection under the provincial Endangered Species Act.

5.9. SPECIES RARITY AND RANKING

Global rank (G-rank) for species have been assigned by a consensus of the network of Conservation Data Centres, scientific experts and The Nature Conservancy to designate rarity based on the status of a species, subspecies or variety throughout its range (Natural Heritage Information Centre, 2009). G-ranks range from G1 (Critically Imperiled - at very high risk of extinction due to extreme rarity; often with 5 or fewer populations, very steep declines, or other factors) to G5 (Secure - common, widespread, abundant).

Provincial (Sub-national) ranks, S-ranks, have been assigned by the Natural Heritage Information Centre for species and vegetation communities in Ontario. These S-ranks range from S1 (Critically Imperiled - 5 or fewer locations or because of factors which make it especially vulnerable to extirpation in Ontario) to S5 (Secure - common, abundant and widespread in Ontario). Ranks of S1, S2 and S3 are considered to be provincially rare. In some cases, a species is given a range rank (e.g. S2S3) to indicate a range of uncertainty about the status of the species. In other cases, a species is given a rank followed by a question mark (e.g. S3?) indicating the rank is uncertain. S-ranks do not carry any legal protection status although they are used to set protection and conservation priorities for rare species and natural communities.

Regional rarity information is only available for flora species. For the purposes of the NAI project, regional rarity information follows Kaiser (2001). A plant species noted as regionally rare by Kaiser is one that is rare in the Region of Peel and the Credit River Watershed.

Toronto and Region Conservation Authority has developed a system for assigning a local “L”-rank to species and communities, indicating the degree of conservation concern warranted by each species within the TRCA jurisdiction (Toronto and Region Conservation Authority, 2007b; Toronto and Region Conservation Authority, 2007c). TRCA L-ranks are calculated based on a variety of criteria and hence do not solely reflect rarity. Vegetation community scores and ranks are based on two criteria: local occurrence and the number of geophysical requirements or factors on which they depend. Flora species are scored using four criteria: local occurrence, population trends, habitat dependence and sensitivity to development. Fauna species are scored based on seven criteria: local occurrence, local population trends, continent-wide population trend, habitat dependence, sensitivity to development, area-sensitivity and patch isolation sensitivity. L-ranks range from L1 (species/communities of maximum conservation concern) to L5 (species/communities considered secure within the TRCA jurisdiction). Species/communities with L-ranks of L1 to L3 are considered regional Species/Communities of Conservation Concern whereas a rank of L4 is considered to be of conservation concern in urban areas but are not of conservation concern where they occur in rural areas (Toronto and Region Conservation Authority, 2007b; Toronto and Region Conservation Authority, 2007c) and are referred to as TRCA regional Species/Communities of Urban Conservation Concern. Rarity (local occurrence) is still considered but is now one of many criteria that make up the L-ranks, making it possible to recognize communities or species of regional concern before they become rare. In the context of TRCA L-ranks, “regional” refers to the region of TRCA’s jurisdiction. Note that in this report, L-ranks are only indicated for areas within the TRCA jurisdiction.

5.10. DISTURBANCES

Both human and natural disturbances to the natural area are included in this section. Disturbances are factors that would not be present in a "pristine" community and may play a role in the alteration of the nature of a community. For example, beaver damming of a stream through a swamp (treed wetland) and the subsequent flooding is considered a disturbance because the flooding may cause the death of the trees and the change of the community to a marsh or pond. Fire is another form of disturbance regardless of whether it is natural (lightening strike) or caused by humans. Communities with certain types of disturbance or significant amounts (extent or intensity) of disturbance could change in the future to some other community type.

Observations on disturbance in natural areas are based on the qualitative assessments of the field workers that conducted the vegetation community descriptions and classifications (ELC crews). Disturbance may range in extent from localized to widespread through the whole natural area. Disturbance intensity may also vary from low to severe. The potential impact or importance of disturbance is case-specific as it is a combination of disturbance extent and intensity. For example, a community that contains a widespread occurrence of a non-native, but not invasive, plant species may be less of a concern than a community that contains localized patches of a highly aggressive invasive species, even if the invasive species population is small at the time.

5.11. ECOLOGICAL FEATURES AND FUNCTIONS

The ecological features and functions of the site are highlighted in this section, starting with at the landscape scale, and progressing to a more site-specific scale.

Recognition of ecological functions comes from the background research and analysis done by CVC's Terrestrial Ecosystem Enhancement Model (TEEM) program which devised a set of metrics that assess how a natural area functions in a landscape context. The TEEM program was initiated in 2006 to develop a natural heritage system for the Credit River Watershed. Landscape scale analysis is a tool to help inform decision-making on natural heritage systems planning. It involves identifying existing natural and semi-natural features on the landscape, then analyzing their relative importance for ecosystem function and providing ecosystem services such as clean air, climate regulation, a pure and abundant supply of water, and flood control. Further information regarding the landscape scale analysis and the CVC natural heritage system can be acquired from *Towards a Natural Heritage System for the Credit River Watershed Phases 1 & 2: Watershed Characterization and Landscape Scale Analysis,* Final Technical Report (Credit Valley Conservation, 2011).)

Through TEEM, CVC has proposed that rural natural areas that contain forest communities over 4 ha in size and urban natural areas that contain any forest communities over 2 ha in size, or wetlands over 0.5 ha in size, or cultural meadows/cultural thicket/cultural savannah totalling over 10 ha in size, have the potential to support and sustain biodiversity and provide for healthy ecosystem functions. The presence of riparian areas contributes to maintaining habitat quality in streams. Areas that contain more than 4 general community types (e.g. deciduous forests, coniferous forests, mixed forests, meadow marshes, shallow marshes, deciduous swamps etc. but excluding cultural meadows) are high-functioning in supporting biodiversity especially for species that require more than one habitat type for their life needs. Areas that support rare vegetation communities have extra potential to support biodiversity by providing special habitat for species that are uncommon. Natural areas that have connectivity or close proximity with other natural areas contribute to ecosystem stability and resilience by allowing for wildlife movement, gene flow and recovery from disturbance. Natural areas through which a major river (TEEM focussed on the Credit River but other major rivers such as the Humber River and Etobicoke Creek would be similar) passes or is within 300 m of, or areas through which a major tributary of the major river pass, support these major watercourses as cross-regional wildlife movement corridors and contribute to ecosystem stability. When any of the above ecological features occur in the area being described, they are highlighted in this section as potentially contributing to the area's landscape scale ecological function.

Within each natural area, the presence of any features covered in the significant wildlife habitat criteria identified in the *Peel-Caledon Significant Woodlands and Wildlife Habitat Study* (North-South Environmental Inc. et al., 2009) are highlighted so that the area can be evaluated to determine if significant wildlife habitat is present in accordance with the Provincial Policy Statement, Region of Peel Official Plan, and area municipal Official Plan. Note that this report does not designate areas as significant wildlife habitat but instead notes when certain wildlife habitat features exist. Evaluation of the natural area with respect to the significant wildlife habitat guideline documents and/or the PPS will determine whether the natural area contains wildlife habitat that is deemed significant.

5.12. OPPORTUNITIES

This section identifies site-specific actions that could be taken to improve or enhance the ecological integrity or knowledge of the natural area. These opportunities usually stem from three sources. 1. They address some of the disturbances identified above. 2. They identify where the natural area might be improved at a landscape level (e.g. improving connectivity with nearby natural areas) or at a site-specific level (e.g. increasing the size of the natural area or managing the communities more naturally). 3. They address data gaps and identify where other inventories might be productive or important. General stewardship opportunities follow this section.

5.13. MAPS

Two maps are included with each site summary. The first shows the site location in context of nearby roads, watercourses and waterbodies and the shape of the natural area. The first map also shows how nearby or included natural features such as ANSIs, ESAs and PSWs relate to the summarized natural area.

The scale of the second map shows greater detail, including the vegetation communities of the natural area that have been identified. Communities are labelled with a code for their vegetation type – this code is found in the Map Reference column of the ELC Vegetation Communities table in the site summary, linking the types of communities listed with their distribution in the natural area. For large natural areas, the second map may be multi-part due to the level of detail.

6. GENERAL STEWARDSHIP OPPORTUNITIES FOR LANDOWNERS

6.1. OVERVIEW

Landowners are stewards of their land and they have a special opportunity to protect, restore or enhance natural areas on their property. While the following site summaries identify site-specific stewardship opportunities, there are also some that are common to many or most natural areas in the study area. These general stewardship opportunities are outlined below.

6.1.1. Use Native Species in Landscaping: Whenever possible, use native species rather than non-native species, especially adjacent to natural areas. Native species are adapted to local growing conditions, often require less maintenance, and support native pollinators. Non-native species, on the other hand, have not evolved with local climate and soil conditions and are often less suitable food sources. Some non-native species are also invasive, and can establish themselves in natural communities and disrupt the natural ecosystem, eliminating native plants (Credit Valley Conservation, 2010b). To assist landowners with choosing non-invasive garden species, CVC and TRCA have produced a number of resources including from CVC: "*Alternative Plants for Invasive Species*," and "*Native Plant Nurseries and Seed Sources*" which are available on the CVC website, and from TRCA: "*Naturescaping*" and "*A Selection of Native Plants for your Garden*" plus many others available on the TRCA website.

6.1.2. Remove Invasive Species: Landowners may wish to remove invasive plant species that have taken root on their properties. Removing invasive species helps to preserve the native ecosystem. Localized, small-scale infestations offer the best chances for quick elimination as invasive species can be tenacious and hard to eradicate. To assist landowners in identifying and removing invasive plants, CVC has produced a number of resources including "*A Quick Reference Guide to Invasive Plants*" and "*Methods to Control Invasive Species*" (available on the CVC website) and the TRCA website includes an invasive species list as well as links to other invasive species resources. To curtail the spread of exotic or invasive species, do not dispose of yard waste in natural areas and stay on trails when hiking through natural areas to avoid transferring invasive plants and their seeds into new areas (Credit Valley Conservation, 2010b). Yard waste should be disposed of through municipal composting and yard waste disposal programs that are designed to ensure that seeds of waste plants are killed. TRCA and CVC can assist landowners who want to remove invasive species from their natural area properties.

6.1.3. Leave Forest Undergrowth and Standing Dead Trees: Many landowners have forests on their property that they wish to manage in an ecological manner. Toward this goal, landowners are encouraged to minimize the disturbance to undergrowth, fallen logs and standing dead trees within their forests as these are important components of forest ecosystems. Resist the urge to "tidy up" forests by removing underbrush, dead sticks etc. on the ground. Avoid removing low-growing plants such as saplings which are needed to replace older trees as the forest ages, and shrubs and ground cover which provide food and shelter to wildlife. Rotting logs provide micro-habitat for a variety of lichens, fungi, invertebrates and salamanders. Standing dead trees provide nesting habitat and foraging habitat for wildlife. Allowing them to decay promotes nutrient recycling in the ecosystem.

6.1.4. Naturalize Stream Banks and Pond Edges: Water features are a valued component of many properties and have aesthetic value to landowners. Water features are also wildlife "hotspots", used for feeding and shelter. Naturalizing the edges of watercourses and waterbodies by planting trees, shrubs or herbaceous plants along the banks helps preserve water quality and quantity. As vegetation grows, it will stabilize the banks and reduce erosion, shade the water to keep temperatures cool and serve as a barrier to runoff which might contain pollutants such as fertilizer (Credit Valley Conservation and Centre for Land and Water Stewardship, Undated a, b). Vegetated banks will provide additional habitat for wildlife and may attract additional species to use the natural area.

6.1.5. Create or Enhance Species Movement Corridors: Habitat fragmentation occurs when natural communities become separated due to other uses. Fragmentation makes it harder for species to safely move between natural areas (Ontario Ministry of Natural Resources, 1994). By referring to an aerial view of their property (such as Google Earth), landowners can identify natural habitats that are fragmented. New connections or narrow remaining connections between separated natural areas can be created or strengthened by planting trees, shrubs and herbaceous plants, or by allowing natural regeneration to occur.

6.1.6. Maintain Meadows: Grassland birds, such as the Bobolink and Eastern Meadowlark, once used native prairie habitat and now rely on agricultural grassland habitat including pasture and hay fields, as well as meadows (McCracken, 2005). In regions with many abandoned farm fields, such as the NAI study area, the meadows that in the past served as nesting habitat for grassland birds are now undergoing succession as shrubs and trees become established in these fields. These meadows will eventually become treed communities, unsuitable for supporting grassland birds. Rural property owners may wish to maintain some or all of the old farm field as meadow by mowing once every three to five years in late summer or fall (after the young of grassland birds have fledged) to keep woody species from persisting (Credit Valley Conservation and Centre for Land and Water Stewardship., Undated c). Rural owners of hayfields can support grassland breeding birds by cutting hay after the middle of July when the young have left their nests (McCracken, 2005).

6.1.7. Consider Tax-incentive and Other Financial Aid Programs to Help Rural Landowners: The Government of Ontario and the Government of Canada offer tax incentive programs that may be of interest to land owners with natural areas on their properties. The Managed Forest Tax Incentive Program (MFTIP) is available to landowners with at least 10 acres of managed forest on their property. Landowners who apply and qualify for the program, have the managed forest taxed at 25% of the residential land tax rate (Ontario Ministry of Natural Resources, 2006). The Conservation Land Tax Incentive Program (CLTIP) is available to landowners who have a significant ecosystem or other significant natural features on their property and agree to protect it (Ontario Ministry of Natural Resources, 2011b). Landowners receive a 100% tax exemption on the eligible portion of their property. The Ecological Gifts Program provides a tax incentive for property owners with ecologically sensitive land who donate their land or a partial interest in their land to a qualified recipient (Environment Canada, 2006). There are a variety of other programs that provide forms of financial assistance to help landowners protect natural features on their agricultural properties. Conservation authority staff can help landowners access and carry out these programs.

6.1.8. Partner With Environmental Organizations: A number of environmental organizations are eager to partner with landowners on conservation projects. Conservation authorities can offer advice or assistance with tree-planting and stream/pond restoration. Landowners with Butternut (*Juglans cinerea*) and/or very large American Elms (*Ulmus americana*) can assist groups working on recovery activities for these two tree species whose numbers have been decimated by disease.

6.1.9. Submit Species Observations: Conservation authorities collect data on species presence and distributions in their jurisdictions and are interested in receiving reports on species observed especially if the species is believed to be uncommon in the area. Other notable species or natural features worthy of reporting include nesting turtles, bat or snake winter hibernating areas (hibernacula), winter deer yards, areas of frequent road-kill, and locations where colonial-nesting birds such as herons and swallows breed.

7. DEFINITIONS AND ABBREVIATIONS USED IN THIS REPORT

ANSI – Area of Natural & Scientific Interest. An area designated by the OMNR within the province of Ontario that represents significant geological (earth science) and/or biological (life science) features. (Ontario Ministry of Natural Resources, 2011a)

BNAI – Brampton Natural Areas Inventory

COSEWIC – Committee on the Status of Endangered Wildlife in Canada. A committee of experts that assesses and designates Species At Risk in Canada (Committee on the Status of Endangered Wildlife in Canada, 2010).

COSSARO – Committee on the Status of Species at Risk in Ontario. A committee of experts that assesses and classifies Species at Risk in Ontario (Ontario Ministry of Natural Resources, 2011c).

CLTIP – Conservation Land Tax Incentive Program

CVC – Credit Valley Conservation

EAC – Environmental Advisory Committee

ELC - Ecological Land Classification. A system for classifying vegetation communities in Southern Ontario, according to the dominant plant species present, vegetation structure and soil characteristics (Lee *et a*l, 1998).

ESA – Environmentally Significant Area (sometimes referred to as an Environmentally Sensitive Area). An area designated by CVC or TRCA within their jurisdiction. (Credit Valley Conservation, 2007b, Credit Valley Conservation, 2007c)

Extirpated Species– A species that no longer exists in the wild within the jurisdiction (e.g. provincial, national), but exists elsewhere in the wild.

FOIBIS – Flora Ontario Integrated Botanical Information System

GPS – Global Positioning System

G-RANK – Global rank designating rarity based on the global status of a species, subspecies or variety (Natural Heritage Information Centre 2009).

GTA – Greater Toronto Area

HNPNC – Halton/North Peel Naturalist Club

IT IS – Integrated Taxonomic Information System

L-RANK – In this report, this rank only applies to the TRCA jurisdiction. L-rank is the regional rank given to species and communities designating the degree of conservation concern across all of TRCA's jurisdiction (Toronto and Region Conservation Authority, 2007b; Toronto and Region Conservation Authority, 2007c).

MFTIP – Managed Forest Tax Incentive Program

MNR - Ontario Ministry of Natural Resources

NAC – Natural Areas and Corridors

NAI – Natural Areas Inventory

NAS – (Mississauga) Natural Areas Survey

NEP – Niagara Escarpment Plan

NHIC – Natural Heritage Information Centre

OMNR – Ontario Ministry of Natural Resources

ORMCP – Oak Ridges Moraine Conservation Plan

OTF – Ontario Trillium Foundation

PNAC – Potential Natural Areas and Corridors

PPS – Provincial Policy Statement

PSW – Provincially Significant Wetland. A wetland that has been assessed and classified as provincially significant under the Wetland Evaluation System for Ontario (Credit Valley Conservation, 2007b; Credit Valley Conservation 2007c).

SARA – Species at Risk Act. A Canadian Act with the purpose to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from becoming Extirpated or Extinct, to provide for the recovery of Endangered or Threatened species, and to encourage the management of other species to prevent them from becoming at risk (Government of Canada, 2011b; MNR, 2010).

SARO – Species At Risk in Ontario

Special Concern – A designation under COSEWIC or COSSARO that indicates a species that may become a Threatened or an Endangered, because of a combination of biological characteristics and identified threats.

Species At Risk – A species that is Extirpated, Endangered, Threatened or of Special Concern under COSEWIC or COSSARO.

SPNC – South Peel Naturalists' Club

S-RANK – Provincial (sub-national) rank used by the Natural Heritage Information Centre to set protection priorities for rare species and natural communities. These ranks are not legal designations (Natural Heritage Information Centre, 2009).

TEEM – Terrestrial Ecosystem Enhancement Model (CVC)

TRCA – Toronto and Region Conservation Authority

UNESCO – United Nations Educational, Scientific and Cultural Organization.

8. LITERATURE CITED

Bull, W.P. 1938. **From Amphibians to Reptiles**. Perkins Bull Foundation, Toronto, Ontario.

Chapman, L.J. and Putnam, D.F. 1984. **The Physiography of Southern Ontario**. 3rd ed. Special Volume 2. Ontario Ministry of Natural Resources, Ontario Geological Survey, Toronto.

City of Brampton. 2011. **Discover Brampton's History**. Available at http://www.brampton.ca. Last Accessed April 15, 2010.

Committee on the Status of Endangered Wildlife in Canada. 2010. **Canadian Wildlife Species at Risk**. Available at http://www.cosewic.gc.ca/ Last Accessed 04 April, 2011.

Credit Valley Conservation. 2004. **Greenlands Securement Strategy.**

Credit Valley Conservation. 2007a. **Interim Watershed Characterization Report for the Credit River Watershed**.

Credit Valley Conservation. 2007b. **The Making it Work: Credit River Water Management Strategy (Detailed Report)**.

Credit Valley Conservation. 2007c. **The Making it Work: Credit River Water Management Strategy (Executive Summary)**.

Credit Valley Conservation. 2008. **Terra Cotta/Silver Creek Management Plan**.

Credit Valley Conservation. 2010a. **About CVC and Programs & Services Sections**. Available at http://www.creditvalleyca.ca. Last Accessed 15 April, 2010.

Credit Valley Conservation. 2010b. **A Quick Reference Guide to Invasive Plant Species.**

Credit Valley Conservation. 2011. **Towards a Natural Heritage System for the Credit River Watershed**. Phases 1 & 2: Watershed characterization and landscape scale analysis. Final technical report, February 2011. vi + 132p.

Credit Valley Conservation. Undated. **Fishing**. Available at http://www.creditvalleyca.ca/ Last Accessed 16 December 2010.

Credit Valley Conservation and Centre for Land and Water Stewardship. Undated a. **Caring For Your Land And Water : Stream Rehabilitation**. Available at http://www.creditvalleyca.ca/ Last Accessed 15 April 2011.

Credit Valley Conservation and Centre for Land and Water Stewardship. Undated b. **Caring For Your Land And Water : Buffer Strips and Swales**. Available at http://www.creditvalleyca.ca/ Last Accessed 15 Apr., 2011.

Credit Valley Conservation and Centre for Land and Water Stewardship. Undated c. **Caring For Your Land And Water : Old Field Naturalisation**. Available at http://www.creditvalleyca.ca/ Last Accessed 15 Apr., 2011.

Davies, S. and S. Holysh, 2007. **Groundwater Resources of the Credit River Watershed.** Ontario Geological Survey, Groundwater Resources Study 6, 132 pp.

Environment Canada. 2006. **Ecological Gifts Program.** Available at http://www.ec.gc.ca/ Last Accessed 15 Apr., 2011.

Forman, R.T.T. 1995. **Land Mosaics: The Ecology of Landscapes and Regions**. Cambridge University Press, Cambridge, England. 632p.

Government of Canada. 2011a. **ITIS (Integrated Taxonomic Information System).** Canadian Biodiversity Information Facility.

Government of Canada, 2011 b. **Species At Risk Public Registry**. Available at: www.sararegistry.gc.ca/approach/act/default_e.cfm Last Accessed 19 Oct., 2011.

Heritage Mississauga. 2009. **Port Credit.** Available at http://www.heritagemississauga.ca Last Accessed 15 Apr. 2011.

Hodge, P., E.J. Czerwinski, M. Francis, D. Rowlinson, R. Wilson, T. Scarr, and H. Evans. 2008**. Invasive Species in Ontario's Forests**. Section 3, Forest health conditions in Ontario. Ontario Ministry of Natural Resources and Natural Resources Canada. Queen's Printer for Ontario.

Hoffman, D.W., and N.R. Richards. 1953. **Soil Survey of Peel County**. Report Number 18 of the Ontario soil survey. Department of Soils, Ontario Agricultural College, Guelph, and the Experimental Farms Service, Canada Department of Agriculture, Ottawa.

Kaiser, J. 2001. **The Vascular Plant Flora of the Region of Peel and the Credit River Watershed**. Prepared for Credit Valley Conservation, The Regional Municipality of Peel, and Toronto and Region Conservation Authority. Mississauga. 34pp.

Larson, B.M, J.L. Riley, E.A. Snell and H.G. Godschalk. 1999. **The Woodland Heritage of Southern Ontario: A Study of Ecological Change, Distribution and Significance**. Federation of Ontario Naturalists, Don Mills, Ontario. 262 p.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. **Ecological Land Classification for Southern Ontario: First Approximation and Its Application**. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. 225 p.

Mackenzie, A. 2008. **A Short History of the United Empire Loyalists.** PDF. 5pp. Available at http://www.uelac.org Last Accessed 15 Apr., 2011.

McCracken, J. 2005. **Where the Bobolinks Roam: The Plight of North America's Grassland Birds.** Available at http://www.bsc-eoc.org/ Last Accessed 15 Apr., 2011.

Mulvany, C, G.M. Adam and C.B. Robinson. 1885. **History of Toronto and County of York, Ontario.** Volume 1. C. Blackett Robinson Publisher, Toronto, ON.

Niagara Escarpment Commission. 2005. **The Niagara Escarpment Plan**. Queen's Printer for Ontario. 136p.

Niagara Escarpment Commission. 2010. **The Niagara Escarpment Plan**. Office Consolidation March 11, 2010. Queen's Printer for Ontario. 136p.

Natural Heritage Information Centre. 2009. **Glossary**. Ontario Ministry of Natural Resources. Peterborough, Ontario. Available at http://www.biodiversityexplorer.mnr.gov.on.ca/ Last Accessed 5 Apr., 2011.

Natural Heritage Information Centre. 2011. **Element Summary Report**. Ontario Ministry of Natural Resources. Peterborough, Ontario. Available at http://www.biodiversityexplorer.mnr.gov.on.ca/ Last Accessed 14 Mar., 2011.

North-South Environmental Inc., Dougan & Associates and Sorenson Gravely Lowes. 2009. **Peel-Caledon Significant Woodlands and Wildlife Habitat Study**. Report prepared for the Region of Peel and the Town of Caledon, Ontario. xi + 187pp +app.

Ontario Geological Survey, 2011. **OGS Earth**. Ministry of Northern Development and Mines. Online. Available: http://mndmf.gov.on.ca/mines/ogs_earth_e.asp/ Last Accessed 14 Mar., 2011.

Ontario Ministry for Public Infrastructure and Renewal, (now renamed Ministry of Energy and Infrastructure). 2006. **Places to Grow. Growth Plan for the Greater Golden Horseshoe**. Queen's Printer for Ontario.

Ontario Ministry of Municipal Affairs and Housing. 2002. **Oak Ridges Moraine Conservation Plan**. Queen's Printer for Ontario. 82p.

Ontario Ministry of Municipal Affairs and Housing. 2005a. **Provincial Policy Statement**. Queen's Printer for Ontario. 37p. Available at http://www.mah.gov.on.ca/ Last Accessed 14 Mar., 2011.

Ontario Ministry of Municipal Affairs and Housing. 2005b. **Greenbelt Plan**. Queen's Printer for Ontario. 57p. Online. Available at http://www.mah.gov.on.ca/ Last Accessed 14 Mar., 2011.

Ontario Ministry of Natural Resources. 1994. **Extension Notes: The Benefits of Windbreaks.** Available at http://www.lrconline.com/ Last Accessed 15 Apr., 2011.

Ontario Ministry of Natural Resources. 2000. **Significant Wildlife Habitat Technical Guide**. Fish and Wildlife Branch, Wildlfie Section, Science Development and Transfer Branch, Southcentral Services, Peterborough. Queen's Printer for Ontario. 139 pp. + Appendices)pgs 140-361).

Ontario Ministry of Natural Resources. 2005. **Protecting What Sustains Us: Ontario's Biodiversity Strategy.**

Ontario Ministry of Natural Resources, 2006. **Managed Forest Tax Incentive Program (MFTIP) Guide.** Available at: www.mnr.gov.on.ca/en/Business/Forests/Publication/MNR_E000245P.html/ Last Accessed 19 Oct., 2011.

Ontario Ministry of Natural Resources. 2010a. **Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition**. Toronto: Queen's Printer for Ontario. 248 pp.

Ontario Ministry of Natural Resources, 2010b. **Species At Risk in Ontario (SARO) List.** Online. Available: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html Last Accessed 5 Apr., 2011.

Ontario Ministry of Natural Resources. 2011a. **Area of Natural & Scientific Interest** Available at: http://www.mnr.gov.on.ca/ Last Accessed 5 April, 2011.

Ontario Ministry of Natural Resources, 2011b. **Conservation Land Tax Incentive Program (CLTIP).** Available at: www.mnr.gov.on.ca/en/Business/CLTIP/index.html/ Last Accessed 19 Oct., 2011.

Ontario Ministry of Natural Resources, 2011 c. **Species At Risk.** Available at www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/244543.html/ Last Accessed 19 Oct., 2011.

Pysek, P., D.M. Richardson, M. Rehmanek, G.L. Webster, M. Williamson and J. Kirschner, 2004. Alien plants in checklists and flora: towards better communication between taxonomists and ecologists. Taxon 53:131-143.

Regional Municipality of Peel. 2008. **Region of Peel Official Plan**. Office Consolidation November 2008 with 2009 and 2010 amendments.

Toronto Region Conservation Authority. 2002. **Greening Our Watersheds - Revitalization Strategies for Etobicoke and Mimico Creeks**.

Toronto and Region Conservation Authority. 2007a. **Terrestrial Natural Heritage System Strategy.**

Toronto and Region Conservation Authority, 2007b. Terrestrial Natural Heritage Program Data Collection Methodology. Toronto and Region Conservation Authority.

Toronto and Region Conservation Authority, 2007c. Vegetation Community and Species Ranking and Scoring Method. Toronto and Region Conservation Authority.

Toronto Region Conservation Authority. 2008. **Humber River State of the Watershed Reports**.

University of Guelph. 2005. **Flora Ontario- Integrated Botanical Information System (FOIBIS), Phase 1**. Ontario Agricultural College Herbarium. Available at http://www.uoguelph.ca/foibis/ Last Accessed 5 Apr., 2010.

Watkins, Larry. 2006. **Forest Resources of Ontario 2006- State of the Forest Report 2006**. Forest Evaluation and Standards Section, Forest Management branch, Ontario Ministry of Natural Resources. 159p.

APPENDIX A

DESCRIPTIONS OF VEGETATION COMMUNITIES OF THE NAI STUDY AREA

This table lists the dominant species commonly encountered in the vegetation community types of the NAI study area. These community dominants are based on what has been observed in the field within the NAI study area, and associations may differ somewhat from the communities of the same vegetation type found elsewhere in Ontario. The number of samples for each vegetation type varies.

Vegetation Code	Vegetation Community Name	Dominant Species
BOS2-1	Leatherleaf Shrub Kettle Bog	Leatherleaf dominant with Sedge species, Sphagnum Moss species, Narrow-leaved Meadow-sweet and Marsh St. John's-wort.
BOT2-1	Tamarack - Leatherleaf Treed Kettle Bog	American Larch and Leatherleaf dominant with Black Spruce, Paper Birch, Eastern White Cedar, Eastern White Pine, Common Winterberry, Marsh Fern, Broad-leaf Cattail, Three-way Sedge, Three-leaf Solomon's-seal, Bog Laurel, Small Cranberry, Bog Buckbean and Sphagnum Moss.
CUM1-1	Dry - Moist Old Field Meadow	Creeping Thistle, Tufted Vetch, Queen Anne's Lace, Goldenrod species and Grass species. Goldenrod species encountered are most frequently Canada Goldenrod and Late Goldenrod. Grass species encountered are most frequently Kentucky Bluegrass, Awnless Brome and Reed Canary Grass.
CUM1-A	Native Forb Old Field Meadow	Native species dominant. Late Goldenrod, Queen Anne's Lace, Creeping Thistle, Tufted Vetch, Aster species and Grass species. Aster species ecountered are most frequently New England Aster and Panicled Aster. Grass species encountered are most frequently Reed Canary Grass and Awnless Brome.
CUM1-b	Exotic Cool-season Grass Old Field Meadow	Exotic grasses dominant. Grass species encountered are most frequently Awnless Brome and Kentucky Bluegrass. Creeping Thistle, Tufted Vetch, Queen Anne's Lace and New England Aster are also frequently encountered.
CUM1-c	Exotic Forb Old Field Meadow	Common Crown-vetch, Teasel, Queen Anne's Lace, Spiny Plumeless-thistle, Creeping Thistle, Canada Goldenrod and Grass species. Grass species encountered is most frequently Kentucky Bluegrass.
CUP1-3	Black Walnut Deciduous Plantation	Black Walnut dominant with Garlic Mustard and Thicket Creeper

Vegetation Code	Vegetation Community Name	Dominant Species
CUP1-5	Silver Maple Deciduous Plantation	Silver Maple dominant with Manitoba Maple, Hybrid Crack Willow, American Elm, Common Buckthorn, Riverbank Grape and Thicket Creeper.
CUP1-A	Restoration Deciduous Plantation	Green or Red Ash, Manitoba Maple, Silver Maple, Common Buckthorn, Greater Burdock, Canadian Horseweed, Garlic Mustard, Creeping Thistle and Grass species. Grass species encountered is most frequentlyAwnless Brome.
CUP1-C	Black Locust Deciduous Plantation	Black Locust dominant with Tartarian Honeysuckle, Common Buckthorn, Common Red Raspberry, Garlic Mustard and Spotted Touch-me-not.
CUP1-D	Horticultural Deciduous Plantation	Little-leaf Linden
CUP1-G	Apple Deciduous Plantation	Common Apple dominant with Alternate-leaf Dogwood, Avens species and Tall Buttercup.
CUP2-1	Black Walnut - White Pine Mixed Plantation	Black Walnut and Eastern White Pine dominant with White Ash, American Elm, Alternate-leaf Dogwood, Chokecherry, Black Raspberry, Garlic Mustard, Herb-robert, White Avens and Spotted Touch-me-not.
CUP2-A	Restoration Mixed Plantation	White Spruce, Red Pine, Eastern White Pine and Eastern White Cedar.
CUP2-E	Silver Maple - Conifer Mixed Plantation	Silver Maple, Red Pine, White Pine, Carolina Poplar, Thicket Creeper, Common Buckthorn, Black Raspberry, Climbing Nightshade, Garlic Mustard, Herb-robert and Late Goldenrod.
CUP3-1	Red Pine Coniferous Plantation	Red Pine dominant with White Ash, Wild Black Cherry, White Spruce, Eastern White Pine, Sugar Maple, Scotch Pine, Canada Mayflower and Goldenrod species.
CUP3-2	White Pine Coniferous Plantation	Eastern White Pine dominant with White Spruce, Red Pine, Wild Black Cherry, Eastern White Cedar, Scotch Pine and Garlic Mustard.
CUP3-3	Scots Pine Coniferous Plantation	Scotch Pine dominant with White Ash, Wild Black Cherry, Sugar Maple, Chokecherry, Alternate-leaf Dogwood, Thicket Creeper, Common Buckthorn and Grass species.
CUP3-4	Jack Pine Coniferous Plantation	Jack Pine dominant with White Ash, Wild Black Cherry, American Elm, Alternate-leaf Dogwood and Chokecherry.
CUP3-6	European Larch Coniferous Plantation	European Larch dominant with Wild Black Cherry and American Elm.
CUP3-8	White Spruce - European Larch Coniferous Plantation	White Spruce and American Larch dominant with Red Pine, Scotch Pine, Eastern White Cedar, Red-osier Dogwood, Brown-seed Dandelion and Grass species.

Vegetation Code	Vegetation Community Name	Dominant Species
CUP3-A	Restoration Coniferous Plantation	White Spruce, Red Pine, Eastern White Pine, Eastern White Cedar, Manitoba Maple, Black Walnut, Green or Red Ash, Common Buckthorn and Hawthorn species.
CUP3-C	White Spruce Coniferous Plantation	White Spruce dominant with White Ash, Wild Black Cherry, American Elm, Riverbank Grape and Grass species.
CUP3-E	Norway Spruce Coniferous Plantation	Norway Spruce dominant with Late Goldenrod.
CUP3-G	White Cedar Coniferous Plantation	Eastern White Cedar dominant with Wild Black Cherry, White Spruce, White Heath Aster, New England Aster and Grass species.
CUP3-H	Mixed Conifer Coniferous Plantation	Eastern White Pine, Red Pine, White Spruce, White Ash and Common Red Raspberry.
CUP3-J	Colorado Spruce Coniferous Plantation	Blue Spruce dominant with Queen Anne's Lace, Late Goldenrod, Aster species and Grass species.
CUS1-1	Hawthorn Cultural Savannah	Hawthorn species dominant with Manitoba Maple, Red Clover, Grass species, Goldenrod species, Aster species, Sedge species and Thistle species.
CUS1-2A	White Cedar Cultural Savannah	Eastern White Cedar dominant with Sugar Maple, Eastern White Pine, White Spruce, Oxeye Daisy, Wild Basil and Meadow Timothy.
CUS1-A	Native Cultural Savannah	Eastern White Cedar, Wild Black Cherry, Balsam Poplar, Manitoba Maple, Wild Basil, Queen Anne's Lace, Common Strawberry, Late Goldenrod and Grass species. Grass species encountered is most frequently Orchard Grass.
CUS1-A1	Native Deciduous Cultural Savannah	Black Walnut, Red-osier Dogwood, Red Fescue, Awnless Brome, Queen Anne's Lace, Dame's Rocket, Thicket Creeper, Late Goldenrod, White Heath Aster, Panicled Aster and New England Aster.
CUS1-b	Exotic Cultural Savannah	Manitoba Maple, Scotch Pine, Green or Red Ash, American Elm, Red-osier Dogwood, Queen Anne's Lace, New England Aster, Grass species and Goldenrod species. Grass species encountered is most frequently Reed Canary Grass. Goldenrod species encountered is most frequently Canada Goldenrod.
CUT1-1	Sumac Cultural Thicket	Staghorn Sumac dominant with Common Buckthorn, Late Goldenrod, Riverbank Grape and Grass species.

Vegetation Code	Vegetation Community Name	Dominant Species
CUT1-3	Chokecherry Cultural Thicket	Chokecherry dominant with Wild Black Cherry, Eastern White Cedar, Queen Anne's Lace, Aster species and Goldenrod species.
CUT1-5	Raspberry Cultural Thicket	Common Red Raspberry dominant with Common Buckthorn, Hawthorn species, Garlic Mustard, Wild Basil, Woodland Strawberry, Bracken, Bluegrass species, Late Goldenrod, Sedge species and Thistle species.
CUT1-A	Native Sapling Cultural Thicket	Red-osier Dogwood, Common Red Raspberry, Common Buckthorn, Aster species, Spotted Joe-pye Weed, Spotted Touch-me-not and Goldenrod species.
CUT1-A1	Native Deciduous Sapling Cultural Thicket	White Ash, Red-osier Dogwood, Hawthorn species, Sandbar Willow, Common Apple, Common Buckthorn, Late Goldenrod and Grass species.
CUT1-A2	Native Mixed Sapling Cultural Thicket	Sugar Maple, White Ash, Chokecherry, Eastern White Cedar, Common Buckthorn, Thicket Creeper, Late Goldenrod and Grass species
CUT1-A3	Coniferous Sapling Cultural Thicket	Eastern White Pine, Eastern White Cedar, Scotch Pine, Late Goldenrod, Aster species, Flat-top Goldentop, Tufted Vetch and Grass species,
CUT1-b	Buckthorn Cultural Thicket	Common Buckthorn dominant with Manitoba Maple, American Elm, Common Apple, Tartarian Honeysuckle, Hawthorn species, Garlic Mustard, Intermediate Enchanter's Nightshade, White Avens and Wood Nettle. Hawthorn species encountered is most frequently Dotted Hawthorn.
CUT1-c	Exotic Cultural Thicket	Common Buckthorn, Manitoba Maple, Common Apple, Tartarian Honeysuckle, Hawthorn species, Common Elderberry, Awnless Brome, Spotted Touch-me-not and Late Goldenrod. Hawthorn species encountered is most frequently English Hawthorn.
CUT1-E	Red Osier Dogwood Cultural Thicket	Red-osier Dogwood dominant with Riverbank Grape, Thicket Creeper, Common Red Raspberry, Scouring Rush, Reed Canary Grass and Goldenrod species.
CUT1-G	Willow Cultural Thicket	Bebb's Willow, Heart-leaved Willow, Hybrid Crack Willow, Manitoba Maple, Common Red Raspberry, Creeping Thistle, Canada Goldenrod, Greater Burdock, Meadow Fescue and Panicled Aster.

Vegetation Code	Vegetation Community Name	Dominant Species
CUW1-A	Native Cultural Woodland	Trembling Aspen, Eastern White Cedar, White Ash, Wild Black Cherry, Eastern White Pine, Virginia Virgin-bower, Grass species and Goldenrod species. Goldenrod species encountered is most frequently Late Goldenrod.
CUW1-A1	White Cedar Cultural Woodland	Eastern White Cedar dominant with Sedge species.
CUW1-A2	White Pine Cultural Woodland	Eastern White Pine dominant with White Ash, Sugar Maple, Common Buckthorn and Sedge species.
CUW1-A3	Native Deciduous Cultural Woodland	White Ash, Sugar Maple, American Elm, Green or Red Ash, Trembling Aspen, Wild Black Cherry, Common Buckthorn, Thicket Creeper, Late Goldenrod and Grass species.
CUW1-b	Exotic Cultural Woodland	Manitoba Maple, Hybrid Crack Willow, Black Walnut, White Willow, Green or Red Ash, American Elm, Common Buckthorn, Thicket Creeper, Riverbank Grape, Spotted Touch-me-not and Garlic Mustard.
CUW1-D	Hawthorn Cultural Woodland	Hawthorn species dominant with White Ash, Thicket Creeper, Chokecherry and Common Buckthorn.
FEO1-2	Slender Sedge Open Fen	Slender Sedge dominant with Leatherleaf, Moss species, Marsh Fern, Broad-leaf Cattail and Small Cranberry.
FEO1-4	Bog Buckbean - Sedge Open Fen	Bog Buckbean, Marsh Fern and Water Smartweed.
FEO1-5	Beaked Sedge Open Fen	Northwest Territory Sedge dominant with Stalk-grain Sedge, Late Goldenrod and Aster species.
FEOG1-10	Water Horsetail Open Fen	Water Horsetail dominant with American Sweetflag, Yellow Cow-lily and Sedge species. Sedge species encountered is most frequently Three-way Sedge.
FES1-4	Leatherleaf - Forb Shrub Fen	Leatherleaf and Sphagnum Moss species.
FES1-9	Low White Cedar Shrub Fen	Eastern White Cedar dominant with Balsam Poplar, Willow species and Goldenrod species. Willow species encountered is most frequently Bebb's Willow.
FESM1-1	Mixed Shrub Fen	Common Winterberry, Mountain Holly, Willow species, Water Arum, Marsh Cinquefoil, Marsh St. John's-wort and Sphagnum Moss species.
FET1-1	Tamarack Treed Fen	American Larch dominant with Eastern White Cedar, Red Maple, Paper Birch, Leatherleaf, Bog Rosemary, Slender Sedge, Bog Goldenrod, Broad-leaf Cattail, Marsh Fern, Northern Pitcher-plant, Large Cranberry and Sphagnum Moss.

Vegetation Code	Vegetation Community Name	Dominant Species
FOC1-2	Dry-Fresh White Pine - Red Pine Coniferous Forest	Eastern White Pine dominant with White Ash, Sugar Maple, Alternate-leaf Dogwood, Chokecherry and Garlic Mustard.
FOC2-2	Dry-Fresh White Cedar Coniferous Forest	Eastern White Cedar dominant with Balsam Fir, Wild Black Cherry, Paper Birch, White Ash, Sugar Maple, Eastern Hemlock, Trembling Aspen, American Larch and American Elm.
FOC3-1	Fresh-Moist Hemlock Coniferous Forest	Eastern Hemlock dominant with Sugar Maple,White Ash, Balsam Fir, American Beech, Wild Black Cherry, Riverbank Grape and Fern species.
FOC4-1	Fresh-Moist White Cedar Coniferous Forest	Eastern White Cedar dominant with Balsam Fir, White Ash, Trembling Aspen, Wild Black Cherry, Sugar Maple, Chokecherry and Alternate-leaf Dogwood.
FOC4-2	Fresh-Moist White Cedar - Hemlock Coniferous Forest	Eastern White Cedar and Eastern Hemlock dominant with Wild Black Cherry, Sugar Maple, Eastern Hop-hornbeam, Eastern White Pine, American Elm, Subarctic Ladyfern, Ostrich Fern and Sedge species.
FOC4-3	Fresh-Moist White Cedar - Balsam Fir Coniferous Forest	Eastern White Cedar and Balsam Fir dominant with Paper Birch, Yellow Birch, White Spruce and Wild Black Cherry.
FOC4-A	Fresh-Moist White Cedar - White Pine Coniferous Forest	Eastern White Cedar and Eastern White Pine dominant with Sugar Maple and Wild Black Cherry.
FOCM6-1	Dry - Fresh White Pine Naturalized Coniferous Plantation	Eastern White Pine with White Ash, Wild Black Cherry and Sugar Maple.
FOCM6-2	Dry - Fresh Red Pine Naturalized Coniferous Plantation	Red Pine with White Ash, Wild Black Cherry, White Spruce, Sugar Maple, Eastern White Pine, Eastern White Cedar, Chokecherry, Spinulose Shield-fern and Garlic Mustard.
FOCM6-3	Dry - Fresh Scotch Pine Naturalized Coniferous Plantation	Scotch Pine with Balsam Fir, Wild Black Cherry, Paper Birch, Eastern White Cedar, Alternate-leaf Dogwood, Chokecherry, Common Buckthorn, Sweet-scent Bedstraw, Canada Mayflower and Gypsy-weed.
FOD1-1	Dry-Fresh Red Oak Deciduous Forest	Northern Red Oak dominant with White Ash.
FOD1-3	Dry-Fresh Black Oak Deciduous Forest	Black Oak dominant with Wild Black Cherry, White Ash, Alternate-leaf Dogwood, Bella Honeysuckle, Thicket Creeper, Large-leaved Avens, Garlic Mustard and Intermediate Enchanter's Nightshade.

Vegetation Code	Vegetation Community Name	Dominant Species
FOD2-3	Dry-Fresh Hickory Deciduous Forest	Bitter-nut Hickory frequently dominant with Black Walnut, Alternate-leaf Dogwood, Thicket Creeper, Chokecherry, Intermediate Enchanter's Nightshade and Sedge species.
FOD2-4	Dry-Fresh Oak - Hardwood Deciduous Forest	Northern Red Oak and/or Bur Oak frequently dominant with White Ash, Red Maple, Sugar Maple, American Beech and Chokecherry.
FOD3-1	Dry-Fresh Poplar Deciduous Forest	Trembling Aspen and Balsam Poplar frequently dominant with White Ash, Sugar Maple, Wild Black Cherry, Paper Birch, Green or Red Ash, Eastern White Cedar and Alternate-leaf Dogwood.
FOD3-2	Dry-Fresh White Birch Deciduous Forest	Paper Birch dominant with White Ash, Eastern White Cedar, Trembling Aspen and Wild Black Cherry.
FOD4-1	Dry-Fresh Beech Deciduous Forest	American Beech dominant with Sugar Maple, White Ash and Eastern Hop-hornbeam.
FOD4-2	Dry-Fresh White Ash Deciduous Forest	White Ash dominant with Sugar Maple, Wild Black Cherry, Paper Birch, American Elm, Trembling Aspen, Chokecherry, Common Buckthorn and Alternate-leaf Dogwood.
FOD4-A	Dry-Fresh Ironwood Deciduous Forest	Eastern Hop-hornbeam dominant with Sugar Maple, Eastern Hemlock, American Beech, White Ash and Alternate-leaf Dogwood.
FOD4-B	Dry-Fresh Manitoba Maple Deciduous Forest	Manitoba Maple dominant with Riverbank Grape, American Basswood, Black Walnut, Thicket Creeper, Common Buckthorn, Garlic Mustard, Dame's Rocket and Avens species.
FOD4-C	Dry-Fresh Black Locust Deciduous Forest	Black Locust dominant with Sugar Maple, White Ash, Manitoba Maple, Alternate-leaf Dogwood, Common Buckthorn and Garlic Mustard.
FOD4-F	Dry-Fresh Black Cherry Deciduous Forest	Wild Black Cherry dominant with Eastern Hop-hornbeam, Sugar Maple, White Ash, Eastern White Cedar, Thicket Creeper, Chokecherry and Intermediate Enchanter's Nightshade.
FOD4-H	Dry-Fresh Hawthorn - Apple Deciduous Forest	Hawthorn species and Common Apple dominant with White Ash, American Elm, Bitter-nut Hickory, Common Buckthorn, Riverbank Grape, Thicket Creeper and Intermediate Enchanter's Nightshade.

Vegetation Code	Vegetation Community Name	Dominant Species
FOD4-I	Dry-Fresh Red Maple Deciduous Forest	Red Maple dominant with White Ash, Paper Birch, Trembling Aspen and Alternate-leaf Dogwood.
FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest	Sugar Maple dominant with White Ash, American Beech, Wild Black Cherry, Eastern Hop-hornbeam, Eastern Hemlock, Alternate-leaf Dogwood and Chokecherry.
FOD5-10	Dry-Fresh Sugar Maple - White Birch - Poplar Deciduous Forest	Sugar Maple and Paper Birch dominant with White Ash, Wild Black Cherry, Balsam Fir, Large-tooth Aspen, Eastern White Cedar, Trembling Aspen and Northern Red Oak.
FOD5-2	Dry-Fresh Sugar Maple - Beech Deciduous Forest	Sugar Maple and American Beech dominant with Wild Black Cherry, White Ash, Eastern Hemlock, Eastern Hop-hornbeam, Alternate-leaf Dogwood, Chokecherry, Intermediate Enchanter's Nightshade and Giant Blue Cohosh.
FOD5-3	Dry-Fresh Sugar Maple - Oak Deciduous Forest	Sugar Maple and Northern Red Oak frequently dominant with American Beech, Eastern Hop-hornbeam, American Basswood and Common Buckthorn.
FOD5-4	Dry-Fresh Sugar Maple - Ironwood Deciduous Forest	Sugar Maple and Eastern Hop-hornbeam dominant with White Ash, American Beech, Wild Black Cherry, American Elm, Chokecherry, Alternate-leaf Dogwood, Zig-zag Goldenrod, Garlic Mustard and Intermediate Enchanter's Nightshade.
FOD5-5	Dry-Fresh Sugar Maple - Hickory Deciduous Forest	Sugar Maple and Bitter-nut Hickory frequently dominant with American Beech and Eastern Hop-hornbeam.
FOD5-6	Dry-Fresh Sugar Maple - Basswood Deciduous Forest	Sugar Maple and American Basswood dominant with American Beech, White Ash, Black Ash, Wild Black Cherry, American Hornbeam, Alternate-leaf Dogwood, Thicket Creeper, Giant Blue Cohosh and Ostrich Fern.
FOD5-7	Dry-Fresh Sugar Maple - Black Cherry Deciduous Forest	Sugar Maple and Wild Black Cherry dominant with White Ash, Eastern White Cedar, American Beech, Eastern Hop-hornbeam, Alternate-leaf Dogwood, Chokecherry and Intermediate Enchanter's Nightshade.
FOD5-8	Dry-Fresh Sugar Maple - White Ash Deciduous Forest	Sugar Maple and White Ash dominant with Wild Black Cherry, Eastern Hop-hornbeam, American Beech, American Basswood, Chokecherry, Alternate-leaf Dogwood and Zig-zag Goldenrod.
FOD5-9	Dry-Fresh Sugar Maple - Red Maple Deciduous Forest	Sugar Maple and Red Maple dominant with Wild Black Cherry, Green or Red Ash and Chokecherry.

Vegetation Code	Vegetation Community Name	Dominant Species
FOD6-1	Fresh-Moist Sugar Maple - Lowland Ash Deciduous Forest	Sugar Maple and Green or Red Ash frequently dominant with Eastern White Cedar, Eastern Hemlock, Balsam Fir, White Ash, Alternate-leaf Dogwood, Chokecherry and Fern species.
FOD6-2	Fresh-Moist Sugar Maple - Black Maple Deciduous Forest	Sugar Maple and Black Maple dominant with Eastern Hop-hornbeam, White Ash and Common Buckthorn.
FOD6-3	Fresh-Moist Sugar Maple - Yellow Birch Deciduous Forest	Sugar Maple and Yellow Birch dominant with Eastern Hemlock.
FOD6-4	Fresh-Moist Sugar Maple - White Elm Deciduous Forest	Sugar Maple dominant with White Ash, American Beech and Garlic Mustard.
FOD6-5	Fresh-Moist Sugar Maple - Hardwood Deciduous Forest	Sugar Maple, White Ash, Wild Black Cherry, American Beech, American Basswood, Eastern Hop-hornbeam, Eastern Hemlock, Paper Birch, Alternate-leaf Dogwood and Chokecherry.
FOD7-1	Fresh-Moist White Elm Lowland Deciduous Forest	American Elm dominant with Trembling Aspen, Balsam Poplar, Manitoba Maple, White Ash, Sugar Maple, Alternate-leaf Dogwood and Common Buckthorn.
FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest	Green or Red Ash frequently dominant with Manitoba Maple, American Elm, American Basswood, Trembling Aspen, Common Buckthorn, Chokecherry and Spotted Touch-me-not.
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest	Hybrid Crack Willow frequenly dominant with Manitoba Maple, Green or Red Ash, Black Walnut,Common Buckthorn, Spotted Touch-me-not, Garlic Mustard and Stinging Nettle.
FOD7-4	Fresh-Moist Black Walnut Lowland Deciduous Forest	Black Walnut dominant with Manitoba Maple, Green or Red Ash, White Ash, Common Buckthorn, Thicket Creeper, Riverbank Grape, Intermediate Enchanter's Nightshade and Spotted Touch-me-not.
FOD7-a	Fresh-Moist Manitoba Maple Lowland Deciduous Forest	Manitoba Maple dominant with Hybrid Crack Willow, White Ash, Norway Maple, Black Walnut, Common Buckthorn, Thicket Creeper, Garlic Mustard, Dame's Rocket and Spotted Touch-me-not.
FOD7-b	Fresh-Moist Norway Maple Lowland Deciduous Forest	Norway Maple dominant with Manitoba Maple, White Ash, Large-tooth Aspen, Alternate-leaf Dogwood, Thicket Creeper, Late Goldenrod and Garlic Mustard.
FOD7-D	Fresh-Moist Red Maple Lowland Deciduous Forest	Red Maple dominant with Sugar Maple, Eastern Hop-hornbeam, American Beech, Alternate-leaf Dogwood, Thicket Creeper, Chokecherry, Common Buckthorn, Red Baneberry and Jack-in-the-pulpit.
FOD7-F	Fresh-Moist Basswood Lowland Deciduous Forest	American Basswood dominant with Green or Red Ash.

Vegetation Code	Vegetation Community Name	Dominant Species
FOD8-1	Fresh-Moist Poplar Deciduous Forest	Trembling Aspen and Balsam Poplar frequently dominant with Green or Red Ash, Paper Birch, American Elm, Sugar Maple, White Ash, Chokecherry, Common Buckthorn and Red-osier Dogwood.
FOD8-B	Fresh-Moist Paper Birch Deciduous Forest	Paper Birch dominant with Sugar Maple, Green or Red Ash, American Elm, White Ash, Wild Black Cherry, Eastern White Cedar, Alternate-leaf Dogwood and Chokecherry.
FOD9-1	Fresh-Moist Oak - Sugar Maple Deciduous Forest	Bur Oak, White Oak, Northern Red Oak and Sugar Maple frequently dominant with Black Maple, White Ash, Shag-bark Hickory, Eastern Hop-hornbeam and Chokecherry.
FOD9-2	Fresh-Moist Oak - Maple Deciduous Forest	Bur Oak and Hybrid Maple frequently dominant with American Elm, Common Buckthorn, Chokecherry, Yellow Avens, Fowl Manna-grass and Spotted Touch-me-not.
FOD9-3	Fresh-Moist Bur Oak Deciduous Forest	Bur Oak dominant with Shag-bark Hickory, Green or Red Ash, Sugar Maple, American Basswood and Common Buckthorn.
FOD9-4	Fresh-Moist Shagbark Hickory Deciduous Forest	Shag-bark Hickory dominant with Sugar Maple, Green or Red Ash, American Elm, Northern Red Oak, Bur Oak, Eastern Hop-hornbeam, Common Buckthorn and Chokecherry.
FOD9-5	Fresh-Moist Bitternut Hickory Deciduous Forest	Bitter-nut Hickory dominant with Common Buckthorn.
FOD9-A	Fresh-Moist Oak - Beech Deciduous Forest	American Beech and Northern Red Oak frequently dominant with Sugar Maple, White Ash and Chokecherry.
FODM5-11	Dry - Fresh Sugar Maple - Hardwood Deciduous Forest	Sugar Maple, White Ash, Wild Black Cherry, American Beech, Eastern Hop-hornbeam, Paper Birch, Eastern Hemlock, Alternate-leaf Dogwood, Chokecherry and Sedge species.
FODM7-6	Fresh-Moist Black Ash - Hardwood Lowland Deciduous Forest	Black Ash dominant with American Elm.
FODR1-1	Dry - Fresh Sugar Maple - Hardwood Calcareous Shallow Deciduous Forest	Sugar Maple dominant with White Ash, Eastern Hop-hornbeam and Alternate-leaf Dogwood.
FOM2-1	Dry-Fresh White Pine - Oak Mixed Forest	Eastern White Pine and Northern Red Oak frequently dominant with Sugar Maple, Eastern Hemlock, Bitter-nut Hickory, American Basswood, Garlic Mustard and Jack-in-the-pulpit.
FOM2-2	Dry-Fresh White Pine - Sugar Maple Mixed Forest	Eastern White Pine and Sugar Maple dominant with White Ash and Eastern Hemlock.

Vegetation Code	Vegetation Community Name	Dominant Species
FOM2-A	Dry-Fresh White Pine - Hardwood Mixed Forest	Eastern White Pine, Sugar Maple, Wild Black Cherry, White Ash, American Basswood, American Elm, Alternate-leaf Dogwood, Fan Clubmoss and Garlic Mustard.
FOM3-1	Dry-Fresh Hardwood Hemlock Mixed Forest	Eastern Hemlock, Sugar Maple, White Ash, American Beech, Wild Black Cherry, Paper Birch, Eastern White Cedar and Chokecherry.
FOM3-2	Dry-Fresh Sugar Maple - Hemlock Mixed Forest	Sugar Maple and Eastern Hemlock dominant with White Ash, American Beech, Wild Black Cherry, Paper Birch, Eastern White Cedar, Eastern Hop-hornbeam, and Chokecherry.
FOM4-1	Dry-Fresh White Cedar - White Birch Mixed Forest	Eastern White Cedar and Paper Birch dominant with Balsam Fir, White Ash, Sugar Maple, Wild Black Cherry, Trembling Aspen and American Elm.
FOM4-2	Dry-Fresh White Cedar - Poplar Mixed Forest	Eastern White Cedar and Balsam Poplar frequently dominant with White Ash, Balsam Fir, Wild Black Cherry, White Spruce, Chokecherry and Alternate-leaf Dogwood.
FOM4-A	Dry-Fresh White Cedar - Hardwood Mixed Forest	Eastern White Cedar, White Ash, Wild Black Cherry, Sugar Maple, Paper Birch, Balsam Fir, American Elm, Chokecherry, Alternate-leaf Dogwood and Sedge species.
FOM5-1	Dry-Fresh White Birch Mixed Forest	Paper Birch dominant with Balsam Fir, White Ash, Red Maple and Sugar Maple.
FOM5-2	Dry-Fresh Poplar Mixed Forest	Balsam Poplar, Trembling Aspen, Large-tooth Aspen, Eastern White Cedar, White Spruce, Sugar Maple, Green or Red Ash, Wild Black Cherry, White Ash, Alternate-leaf Dogwood, Chokecherry and Sedge species.
FOM6-1	Fresh-Moist Sugar Maple - Hemlock Mixed Forest	Sugar Maple and Eastern Hemlock dominant with American Beech, Eastern Hop-hornbeam, Yellow Birch, White Ash, Wild Black Cherry, Eastern White Cedar, Paper Birch and Alternate-leaf Dogwood.
FOM6-2	Fresh-Moist Hemlock - Hardwood Mixed Forest	Eastern Hemlock, Sugar Maple, White Ash, Eastern White Cedar, Red Maple, Balsam Fir, Yellow Birch, American Beech and Wild Black Cherry.
FOM7-1	Fresh-Moist White Cedar - Sugar Maple Mixed Forest	Eastern White Cedar and Sugar Maple dominant with Wild Black Cherry, Balsam Fir, Paper Birch, White Ash, Yellow Birch, Eastern Hemlock and Alternate-leaf Dogwood.

Vegetation Code	Vegetation Community Name	Dominant Species
FOM7-2	Fresh-Moist White Cedar - Hardwood Mixed Forest	Eastern White Cedar, Sugar Maple, Paper Birch, White Ash, Wild Black Cherry, Trembling Aspen, Balsam Fir, Green or Red Ash and Eastern Hemlock.
FOM8-1	Fresh-Moist Poplar Mixed Forest	Trembling Aspen, Balsam Fir, Wild Black Cherry, Eastern White Cedar, Paper Birch and Green or Red Ash.
FOM8-2	Fresh-Moist White Birch Mixed Forest	Paper Birch, Trembling Aspen and American Elm.
FOMA-A	Fresh-Moist White Pine - Sugar Maple Mixed Forest	Eastern White Pine and Sugar Maple dominant with White Ash, Bitter-nut Hickory and Green or Red Ash.
FOMM10-1	Fresh-Moist Balsam Fir-Hardwood Mixed Forest	Balsam Fir, Sugar Maple, Eastern White Cedar, Paper Birch, White Ash, Wild Black Cherry, Trembling Aspen and Sedge species.
FOMM10-2	Fresh-Moist White Spruce - Hardwood Mixed Forest Type	White Spruce, Eastern White Cedar, Trembling Aspen, Balsam Fir, Wild Black Cherry, Chokecherry, Sensitive Fern and Sedge species.
FOMM9-2	Fresh-Moist White Pine - Hardwood Mixed Forest	Eastern White Pine, Chokecherry and Common Buckthorn.
MAM2-1	Bluejoint Mineral Meadow Marsh	Canada Blue-joint dominant with Willow-herb species, Spotted Joe-pye Weed, Spotted Touch-me-not, Goldenrod species, Climbing Nightshade, Panicled Aster and Broad-leaf Cattail.
MAM2-10	Forb Mineral Meadow Marsh	Spotted Joe-pye Weed, Ostrich Fern, Spotted Touch-me-not, Stinging Nettle, Goutweed, Aster species, Grass species, and Sedge species. Aster species encountered is most frequently Swamp Aster. Grass species encountered is most frequently Reed Canary Grass.
MAM2-2	Reed Canary Grass Mineral Meadow Marsh	Reed Canary Grass dominant with Spotted Joe-pye Weed, Spotted Touch-me-not, Purple Loosestrife, Stinging Nettle, Broad-leaf Cattail, Aster species, Grass species and Red-osier Dogwood. Aster species encountered is most frequently Panicled Aster.
MAM2-3	Red-top Mineral Meadow Marsh	Black Bentgrass dominant with Red Fescue, Kentucky Bluegrass, Rice Cutgrass, Purple-leaf Willow-herb, Purple Loosestrife and Panicled Aster.
MAM2-6	Broad-leaved Sedge Mineral Meadow Marsh	Sedge species, Spotted Joe-pye Weed, Flat-top Goldentop and Late Goldenrod.

Vegetation Code	Vegetation Community Name	Dominant Species
MAM2-7	Horsetail Mineral Meadow Marsh	Field Horsetail frequently dominant with Sedge species, Rush species, Spotted Joe-pye Weed, Flat-top Goldentop, Spotted Touch-me-not and Late Goldenrod. Rush species encountered are most frequently Scouring Rush and Variegated Scouring Rush.
MAM2-9	Jewelweed Mineral Meadow Marsh	Spotted Touch-me-not dominant with Garlic Mustard, Bulblet Fern, White Avens, Ostrich Fern, and Zig-zag Goldenrod.
MAM2-a	Common Reed Mineral Meadow Marsh	Common Reed dominant with Broad-leaf Cattail.
MAM3-1	Bluejoint Organic Meadow Marsh	Canada Blue-joint dominant with Reed Canary Grass, Broad-leaf Cattail, Red-osier Dogwood, Purple Loosestrife, Sedge species and Willow species.
MAM3-2	Reed-canary Grass Organic Meadow Marsh	Reed Canary Grass dominant with Spotted Joe-pye Weed, Spotted Touch-me-not, Broad-leaf Cattail, Climbing Nightshade, California Nettle and Sedge species.
MAM3-3	Rice Cut-grass Organic Meadow Marsh	Rice Cutgrass dominant with Nodding Beggar-ticks, Barnyard Grass, and Spotted Touch-me-not.
MAM3-5	Narrow-leaved Sedge Organic Meadow Marsh	Sedge species dominant with Northern Bugleweed and Grass species. Grass species encountered is most frequently Reed Canary Grass.
MAM3-9	Mixed Forb Organic Meadow Marsh	Spotted Joe-pye Weed, Spotted Touch-me-not, Red-osier Dogwood, Broad-leaf Cattail, Grass species, Goldenrod species, Sedge species and Aster species. Grass species encountered is most frequently Reed Canary Grass. Aster species encountered is most frequently Swamp Aster.
MAMM1-2	Cattail Graminoid Mineral Meadow Marsh	Cattails dominant including Broad-leaf Cattail, Narrow-leaved Cattail and White Cattail with Reed Canary Grass, Purple Loosestrife, Spotted Touch-me-not, Spotted Joe-pye Weed, Panicled Aster and Peach-leaved Willow.
MAMM1-6	Tall Manna Grass Graminoid Mineral Meadow Marsh	Reed Manna-grass dominant with Reed Canary Grass, Red-osier Dogwood and Late Goldenrod.
MAMM2-6	Joe Pye Weed Forb Mineral Meadow Marsh	Spotted Joe-pye Weed dominant with Reed Canary Grass and Spotted Touch-me-not.
MAMM2-7	Ostrich Fern Forb Mineral Meadow Marsh	Ostrich Fern dominant.

Vegetation Code	Vegetation Community Name	Dominant Species
MAMM3-1	Mixed Mineral Meadow Marsh	Ostrich Fern, Spotted Joe-pye Weed, Spotted Touch-me-not, Great-hairy Willow-herb, Goutweed, Grass species, Goldenrod species and Aster species. Aster species encountered is most frequently Panicled Aster. Grass species encountered is most frequently Reed Canary Grass.
MAMO1-2	Cattail Graminoid Organic Meadow Marsh	Broad-leaf Cattail and/or Narrow-leaved Cattail dominant with Reed Canary Grass, Canada Blue-joint, Spotted Joe-pye Weed, Spotted Touch-me-not, Red-osier Dogwood, Sedge species and Bedstraw species.
MAMO2-2	Joe Pye Weed Forb Organic Meadow Marsh	Spotted Joe-pye Weed dominant with Ostrich Fern, Sensitive Fern, Late Goldenrod, Lake-bank Sedge, Peppermint and Grass species. Grass species encountered are most frequently Reed Canary Grass and Canada Blue-joint.
MAS2-1	Cattail Mineral Shallow Marsh	Broad-leaf Cattail and/or Narrow-leaved Cattail dominant with Purple Loosestrife.
MAS2-1A	Broad-leaved Cattail Mineral Shallow Marsh	Broad-leaf Cattail dominant with Reed Canary Grass, Sedge species, Hemlock Water-parsnip, Spotted Joe-pye Weed, Climbing Nightshade and Narrow-leaved Cattail.
MAS2-1b	Narrow-Leaved Cattail Mineral Shallow Marsh	Narrow-leaved Cattail dominant with Broad-leaf Cattail, Purple Loosestrife, Lesser Duckweed, Greater Duckweed, White Cattail and California Nettle.
MAS2-3	Narrow-leaved Sedge Mineral Shallow Marsh	Tussock Sedge, Scouring Rush, Late Goldenrod and Aster species,
MAS2-4	Broad-leaved Sedge Mineral Shallow Marsh	Hop Sedge, Cyperus-like Sedge, Hemlock Water-parsnip and Climbing Nightshade.
MAS2-7	Bur-reed Mineral Shallow Marsh	Bur-reed species dominant, frequntly Greenfruit Bur-reed, American Water-plantain, Lesser Duckweed, Northern Bugleweed, Cottongrass Bulrush, Climbing Nightshade and Shining Willow.
MAS2-8	Rice Cut-grass Mineral Shallow Marsh	Rice Cutgrass dominant with Sedge species, Northern Bugleweed, Moss species and Pondweed species.
MAS2-9	Forb Mineral Shallow Marsh	Nodding Beggar-ticks, Lesser Duckweed, Hemlock Water-parsnip, Climbing Nightshade and Marsh Fern.
MAS2-a	Common Reed Mineral Shallow Marsh	Common Reed dominant.
MAS2-d	Reed Canary Grass Mineral Shallow Marsh	Reed Canary Grass dominant with Nodding Beggar-ticks, Lesser Duckweed and Lesser Bladderwort.

Vegetation Code	Vegetation Community Name	Dominant Species
MAS3-1	Cattail Organic Shallow Marsh	Broad-leaf Cattail or Narrow-leaved Cattail dominant with Red-osier Dogwood, Climbing Nightshade, Sedge species and Grass species. Grass species encountered are most frequently Reed Canary Grass and Canada Blue-joint.
MAS3-10	Forb Organic Shallow Marsh	Aster species, Sedge species, Willow-herb species, Horsetail species, Spotted Joe-pye Weed, Bedstraw species, Spotted Touch-me-not, Wild Mint, Climbing Nightshade and Broad-leaf Cattail.
MAS3-12	Water Willow Organic Shallow Marsh	Hairy Swamp Loosestrife dominant with Sedge species, Lesser Duckweed, Purple Loosestrife and Broad-leaf Cattail.
MAS3-1A	Broad-leaved Cattail Organic Shallow Marsh	Broad-leaf Cattail dominant with Narrow-leaved Cattail, Reed Canary Grass, Spotted Touch-me-not and Sedge species.
MAS3-1B	Narrow-leaved Cattail Organic Shallow Marsh	Narrow-leaved Cattail dominant with Broad-leaf Cattail and Willow species.
MAS3-8	Rice Cut-grass Organic Shallow Marsh	Rice Cutgrass dominant.
MAS3-9	Rush Grass Organic Shallow Marsh	Beggar-ticks species, Sedge species, Grass species, Broad-leaf Cattail,
MASO1-3	Canada Blue-joint Graminoid Organic Shallow Marsh	Canada Blue-joint dominant with Reed Canary Grass, Porcupine Sedge, Tussock Sedge, Water Smartweed, Lesser Duckweed, Liverwort species, Broad-leaf Cattail and Red-osier Dogwood.
MASO1-4	Reed Canary Grass Organic Shallow Marsh	Reed Canary Grass dominant with Broad-leaf Cattail, Narrow-leaved Cattail, Stinging Nettle, Spotted Touch-me-not and Lake-bank Sedge.
SAF1-1	Water Lily - Bullhead Lily Floating-leaved Shallow Aquatic	American Water-lily and/or Yellow Cow-lily dominant.
SAF1-3	Duckweed Floating-leaved Shallow Aquatic	Greater Duckweed dominant with Spotless Watermeal.
SAF1-4	Pondweed Floating-leaved Shallow Aquatic	Floating Pondweed dominant with Bulb-bearing Water-hemlock, Spotted Touch-me-not, Reed Canary Grass, Narrow-leaved Cattail, Broad-leaf Cattail, Greater Duckweed and Lesser Duckweed.
SAM1-2	Duckweed Mixed Shallow Aquatic	Duckweed dominant including Lesser Duckweed, Greater Duckweed and Star Duckweed with Sedge species and Flatstem Pondweed.
SAM1-4	Pondweed Mixed Shallow Aquatic	Ponweed dominant, frequently Leafy Pondweed and/or Floating Pondweed with Sessile Water-speedwell.
SAM1-A	Water Lily - Bullhead Lily Mixed Shallow Aquatic	Yellow Cow-lily dominant with Floating Pondweed.
SAS1-1	Pondweed Submerged Shallow Aquatic	Slender Pondweed, Common Hornwort and Slender Naiad.

Vegetation Code	Vegetation Community Name	Dominant Species
SAS1-2	Waterweed Submerged Shallow Aquatic	Canada Waterweed dominant with Curly Pondweed, Flatstem Pondweed, Greater Duckweed and Lesser Duckweed.
SAS1-3	Stonewort Submerged Shallow Aquatic	Muskgrass species dominant with Watershield and Greater Duckweed.
SWC1-1	White Cedar Mineral Coniferous Swamp	Eastern White Cedar dominant with Yellow Birch, Black Ash, Balsam Fir, Paper Birch, American Elm, Bulblet Fern, Spotted Touch-me-not, Field Horsetail and Ostrich Fern.
SWC1-2	White Cedar - Conifer Mineral Coniferous Swamp	Eastern White Cedar dominant with Balsam Fir, Paper Birch, Yellow Birch and Bulblet Fern.
SWC2-2	Hemlock Mineral Coniferous Swamp	Eastern Hemlock dominant with Eastern White Cedar, American Elm, Paper Birch, Jack-in-the-pulpit, Herb-robert, Sedge species and Fern species.
SWC3-1	White Cedar Organic Coniferous Swamp	Eastern White Cedar dominant with Balsam Fir, Yellow Birch, Black Ash, American Elm, Spotted Touch-me-not, Sedge species and Fern species. Fern species encountered is most frequently Bulblet Fern.
SWC3-2	White Cedar - Conifer Organic Coniferous Swamp	Eastern White Cedar, Balsam Fir, Yellow Birch, Red Maple, Black Ash, Paper Birch, Dwarf Red Raspberry, Moss species, Fern species and Sedge species.
SWC4-1	Tamarack - Black Spruce Organic Coniferous Swamp	American Larch and Black Spruce dominant with Eastern White Pine.
SWC4-2	Tamarack Organic Coniferous Swamp	American Larch dominant with Eastern White Cedar, Field Horsetail and Sedge species.
SWC4-A	Tamarack - Balsam Fir - Spruce Organic Coniferous Swamp	American Larch, Balsam Fir and Black Spruce frequently dominant with Eastern White Cedar, Hybrid Maple, Paper Birch, Trembling Aspen, Mountain Maple, Naked Miterwort and Sedge species.
SWD2-1	Black Ash Mineral Deciduous Swamp	Black Ash dominant with American Elm, Trembling Aspen, American Basswood, Balsam Poplar, Eastern White Cedar, Red-osier Dogwood, Riverbank Grape, Spotted Touch-me-not and Sedge species.
SWD2-2	Green or Red Ash, Mineral Deciduous Swamp	Green or Red Ash dominant with American Elm, Trembling Aspen, Sugar Maple, Hybrid Maple, Spotted Touch-me-not and Intermediate Enchanter's Nightshade.
SWD2-A	White Ash Mineral Deciduous Swamp	White Ash dominant with Black Walnut and Avens species.
SWD3-1	Red Maple Mineral Deciduous Swamp	Red Maple dominant with Black Ash, Green or Red Ash, American Elm, Hybrid Maple, Red-osier Dogwood, Spotted Touch-me-not, Sensitive Fern and Climbing Nightshade.

Vegetation Code	Vegetation Community Name	Dominant Species
SWD3-2	Silver Maple Mineral Deciduous Swamp	Silver Maple dominant with Green or Red Ash, American Elm, Hybrid Maple, Black Ash and Fowl Manna-grass.
SWD3-3	Swamp Maple Mineral Deciduous Swamp	Hybrid Maple dominant with American Elm, Black Ash, Green or Red Ash, Eastern White Cedar, Common Buckthorn, Red-osier Dogwood, Spotted Touch-me-not, Sensitive Fern and Sedge species.
SWD3-4	Manitoba Maple Mineral Deciduous Swamp	Manitoba Maple dominant with Black Ash, Crack Willow, American Elm, Red-osier Dogwood, Common Red Raspberry, Spotted Touch-me-not, Ostrich Fern and Avens species.
SWD4-1	Willow Mineral Deciduous Swamp	Willow species dominant with Manitoba Maple, Trembling Aspen, Riverbank Grape, Red-osier Dogwood, Spotted Touch-me-not and Grass species. Willow species encountered is most frequently Peach-leaved Willow. Grass species encountered is most frequently Reed Canary Grass.
SWD4-2	White Elm Mineral Deciduous Swamp	American Elm dominant with Black Ash, Balsam Poplar, Trembling Aspen, Red Maple, Red-osier Dogwood, Sensitive Fern and Grass species.
SWD4-3	White Birch - Poplar Mineral Deciduous Swamp	Paper Birch, Trembling Aspen and Balsam Poplar frequently dominant with American Elm, Black Ash, Eastern White Cedar, Green or Red Ash, Red-osier Dogwood, Dwarf Red Raspberry and Sedge species.
SWD4-4	Yellow Birch Mineral Deciduous Swamp	Yellow Birch dominant with Black Ash, Eastern White Cedar, Red Maple, Eastern Hemlock, Mountain Maple, and Fern species.
SWD5-1	Black Ash Organic Deciduous Swamp	Black Ash dominant with Yellow Birch, American Elm, Eastern White Cedar, Red-osier Dogwood, Dwarf Red Raspberry, Sensitive Fern, Fowl Manna-grass and Sedge species.
SWD6-1	Red Maple Organic Deciduous Swamp	Red Maple dominant with Black Ash, Yellow Birch, Paper Birch, Eastern White Cedar, American Elm, Mountain Maple, Dwarf Red Raspberry and Fern species.
SWD6-2	Silver Maple Organic Deciduous Swamp	Silver Maple dominant with Yellow Birch, Black Ash, American Elm, Red Maple, Hybrid Maple and Fern species. Fern species encountered is most frequently Sensitive Fern.
SWD6-3	Swamp Maple Organic Deciduous Swamp	Hybrid Maple dominant with Ash species, Yellow Birch, American Elm, Silver Maple, Red-osier Dogwood, Sensitive Fern, Hemlock Water-parsnip and Reed Canary Grass. Ash species encountered is most frequently Black Ash.

Vegetation Code	Vegetation Community Name	Dominant Species
SWD7-1	White Birch - Poplar Organic Deciduous Swamp	Paper Birch, Balsam Poplar and Trembling Aspen frequently dominant with Black Ash, Eastern White Cedar, American Elm, Red Maple and Red-osier Dogwood.
SWD7-2	Yellow Birch Organic Deciduous Swamp	Yellow Birch dominant with Black Ash, Red Maple, American Elm, Eastern White Cedar, Hybrid Maple, Mountain Maple, Spotted Touch-me-not, Dwarf Red Raspberry and Fern species. Fern species encountered is most frequently Sensitive Fern.
SWD7-A	Willow Organic Deciduous Swamp	Willow species dominant with American Elm, Dogwood species, Spreading Bentgrass, Fowl Manna-grass, Field Horsetail, Climbing Nightshade and Broad-leaf Cattail.
SWDM4-5	Poplar Mineral Deciduous Swamp	Trembling Aspen and Balsam Poplar frequently dominant with American Elm, Green or Red Ash, Black Ash, Red-osier Dogwood, Riverbank Grape, Spotted Touch-me-not, Aster species and Sedge species.
SWDO1-2	Green or Red Ash, Organic Deciduous Swamp	Green or Red Ash dominant with Black Ash, American Elm, Mountain Maple and Reed Canary Grass.
SWDO3-3	Trembling Aspen Organic Deciduous Swamp	Trembling Aspen dominant with Balsam Poplar, Black Ash, American Elm, Eastern White Cedar, Glossy Buckthorn, Red-osier Dogwood, Sensitive Fern, Sedge species and Grass species.
SWDO3-4	White Elm Organic Deciduous Swamp	American Elm dominant with Black Ash, Trembling Aspen, Eastern White Cedar, Red-osier Dogwood, Common Winterberry, Spotted Touch-me-not and Grass species.
SWM04-1	Balsam Fir - Hardwood Organic Mixed Swamp	Balsam Fir, Black Ash, Eastern White Cedar, Red Maple, Paper Birch, Yellow Birch, American Elm, Fowl Manna-grass and Fern species.
SWM04-2	Hemlock- Hardwood Organic Mixed Swamp	Eastern Hemlock, Yellow Birch, Green or Red Ash, Red Maple, Sugar Maple, American Elm, Balsam Fir, Eastern White Cedar, Sedge species and Fern species.
SWM1-1	White Cedar - Hardwood Mineral Mixed Swamp	Eastern White Cedar, Black Ash, American Elm, Trembling Aspen, Yellow Birch, Balsam Poplar, Paper Birch, Green or Red Ash, Red Maple, Balsam Fir and Fern species.
SWM2-1	Red Maple - Conifer Mineral Mixed Swamp	Red Maple, Eastern Hemlock, Balsam Fir, Eastern White Cedar, Yellow Birch, Paper Birch, Black Ash, Green or Red Ash and Sensitive Fern.

Vegetation Code	Vegetation Community Name	Dominant Species
SWM3-1	Birch - Conifer Mineral Mixed Swamp	Yellow Birch, Paper Birch, Balsam Fir, Eastern White Cedar, Black Ash, Balsam Poplar and American Elm.
SWM3-2	Poplar - Conifer Mineral Mixed Swamp	Balsam Poplar, Trembling Aspen, Balsam Fir, Eastern White Cedar, White Spruce, Green or Red Ash, Paper Birch, American Elm, Chokecherry and Fern species.
SWM4-1	White Cedar - Hardwood Organic Mixed Swamp	Eastern White Cedar, Black Ash, Yellow Birch, Red Maple, Paper Birch, American Elm, Balsam Fir, Red-osier Dogwood and Sedge species.
SWM5-1	Red Maple - Conifer Organic Mixed Swamp	Red Maple, Balsam Fir, Eastern White Cedar, Black Ash, American Elm, Yellow Birch, Common Winterberry and Dwarf Red Raspberry.
SWM5-2	Swamp Maple - Conifer Organic Mixed Swamp	Hybrid Maple, Eastern White Cedar, Eastern Hemlock, Yellow Birch, Red-osier Dogwood, Sensitive Fern, Dwarf Red Raspberry and Moss species.
SWM6-1	Birch - Conifer Organic Mixed Swamp	Yellow Birch, Paper Birch, Balsam Fir, Eastern White Cedar, Eastern Hemlock, Trembling Aspen, Red Maple, Black Ash, Mountain Maple, Spotted Touch-me-not and Dwarf Red Raspberry.
SWM6-2	Poplar - Conifer Organic Mixed Swamp	Trembling Aspen, Balsam Poplar, Eastern White Cedar, Balsam Fir, Yellow Birch, American Elm, Mountain Maple, Red-osier Dogwood, Virginia Strawberry, Dwarf Red Raspberry and Fern species.
SWMA-A	Red/Green or Red Ash, - Hemlock Mineral Mixed Swamp	Green or Red Ash and Eastern Hemlock dominant with Silver Maple, Trembling Aspen, Eastern White Cedar, Balsam Fir, Paper Birch, Black Ash and Riverbank Grape.
SWMM4-2	Black Ash - Conifer Mineral Mixed Swamp	Black Ash, Eastern White Cedar, Balsam Fir, American Elm, Trembling Aspen, Fowl Manna-grass, Fern species and Sedge species. Fern species encountered is most frequently Sensitive Fern.
SWMM5-1	Balsam Fir - Hardwood Mineral Mixed Swamp	Balsam Fir, Green or Red Ash, Paper Birch, American Elm, Balsam Poplar, Trembling Aspen, Eastern White Cedar, Mountain Maple, Alternate-leaf Dogwood and Sedge species.
SWMO3-3	White Birch - Conifer Organic Mixed Swamp	Paper Birch, Eastern White Cedar, Balsam Fir, Black Ash, Mountain Maple, Dwarf Red Raspberry and Fern species.
SWT2-1	Alder Mineral Thicket Swamp	Speckled Alder dominant with Red-osier Dogwood, Spotted Touch-me-not, Reed Canary Grass, Spotted Joe-pye Weed, Sensitive Fern and Eastern White Cedar.

Vegetation Code	Vegetation Community Name	Dominant Species
SWT2-10	Nannyberry Mineral Thicket Swamp	Nannyberry dominant with Silky Dogwood, Red-osier Dogwood, Willow species, Spotted Joe-pye Weed, Swamp Aster, Eastern White Cedar, American Elm and Sedge species.
SWT2-2	Willow Mineral Thicket Swamp	Willow species dominant with Red-osier Dogwood, Spotted Joe-pye Weed, Lesser Duckweed, Sedge species and Grass species. Willow species encountered are most frequently Meadow Willow, Bebb's Willow and Heart-leaved Willow. Grass species encountered is most frequently Reed Canary Grass.
SWT2-5	Red-osier Mineral Thicket Swamp	Red-osier Dogwood dominant with Spotted Touch-me-not, Spotted Joe-pye Weed, Broad-leaf Cattail, Eastern White Cedar, Sedge species, Grass species, Willow species and Aster species. Grass species encountered is most frequently Reed Canary Grass.
SWT2-6	Meadowsweet Mineral Thicket Swamp	Narrow-leaved Meadow-sweet, Willow species, Red-osier Dogwood and Sedge species.
SWT2-8	Silky Dogwood Mineral Thicket Swamp	Silky Dogwood dominant with Sensitive Fern and Goldenrod species.
SWT2-B	Winterberry Mineral Thicket Swamp	Common Winterberry dominant with Red-osier Dogwood, Riverbank Grape, Willow species, Lesser Duckweed, Water Arum, Hemlock Water-parsnip, Greater Bladderwort and Sedge species. Willow species encountered is most frequently Meadow Willow.
SWT3-1	Alder Organic Thicket Swamp	Speckled Alder dominant with Red-osier Dogwood, Spotted Joe-pye Weed, Spotted Touch-me-not, Grass species and Sedge species. Grass species encountered is most frequently Reed Canary Grass.
SWT3-2	Willow Organic Thicket Swamp	Willow species dominant with Red-osier Dogwood, Common Winterberry, Reed Canary Grass, Broad-leaf Cattail and Sedge species. Willow species encountered are most frequently Meadow Willow, Bebb's Willow and Pussy Willow.
SWT3-5	Red-osier Organic Thicket Swamp	Red-osier Dogwood dominant with Willow species, Narrow-leaved Meadow-sweet, Eastern White Cedar, Spotted Joe-pye Weed, Broad-leaf Cattail, Grass species, Aster species and Sedge species. Grass species encountered is most frequently Reed Canary Grass.

Vegetation Code	Vegetation Community Name	Dominant Species
SWT3-7	Winterberry Organic Thicket Swamp	Common Winterberry, Narrow-leaved Meadow-sweet, Red-osier Dogwood, Reed Canary Grass, Sedge species and Sphagnum Moss species.
SWT3-B	Silky Dogwood Organic Thicket Swamp	Roundleaf Dogwood, Willow species,
THDM2-10	Apple Deciduous Shrub Thicket	Common Apple dominant with Common Buckthorn, Hawthorn species, Chokecherry and Green or Red Ash.
THDM2-11	Hawthorn Deciduous Shrub Thicket	Hawthorn species dominant with Common Buckthorn, White Ash, Riverbank Grape, Chokecherry, Manitoba Maple, Wild Black Cherry, Thicket Creeper, Garlic Mustard, Late Goldenrod and Yellow Avens.

VASCULAR PLANTS OF THE NAI STUDY AREA

Full vascular plant species list across the whole NAI study area, with occurrence in region/county indicated. Species in bold type are regionally rare, following Kaiser (2001).

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Abies amabilis	Pacific Silver Fir			√	
Abies balsamea	Balsam Fir	√	√	√	√
Abies concolor	White Fir	√	√		
Abutilon theophrasti	Velvet-leaf	√	√		
Acalypha virginica var. rhomboidea	Three-seeded Mercury	√	√		
Acer campestre	Hedge Maple	√			
Acer ginnala	Amur Maple	√	√		
Acer negundo	Manitoba Maple	√	√	√	√
Acer pensylvanicum	Striped Maple	√	√		
Acer platanoides	Norway Maple	√	√	√	√
Acer pseudo-platanus	Sycamore Maple	√	√		
Acer rubrum	Red Maple	√	√	√	√
Acer saccharinum	Silver Maple	√	√	√	√
Acer saccharum ssp. nigrum	Black Maple	√	√	√	√
Acer saccharum ssp. saccharum	Sugar Maple	√	√	√	√
Acer spicatum	Mountain Maple	√	√	√	√
Acer x freemanii	Hybrid Maple	√	√	√	√
Achillea millefolium ssp. lanulosa	Seaside Yarrow	√			
Achillea millefolium ssp. millefolium	Common Yarrow	√	√	√	√
Acinos arvensis	Spring Savory	√			
Acorus americanus	**American Sweetflag**	√			√
Actaea pachypoda	White Baneberry	√	√	√	√
Actaea rubra	Red Baneberry	√	√	√	√
Actaea x ludovici	Hybrid Baneberry	√	√		√
Adiantum pedatum	Northern Maidenhair-fern	√	√	√	√
Adlumia fungosa	**Climbing Fumitory**	√			
Aegopodium podagraria	Goutweed	√	√	√	
Aesculus glabra	Ohio Buckeye	√	√		
Aesculus hippocastanum	Horse Chestnut	√	√	√	
Agrimonia gryposepala	Tall Hairy Groovebur	√	√	√	√
Agropyron cristatum ssp. pectinatum	Crested Wheatgrass	√			
Agrostemma githago	Common Corncockle	√			
Agrostis gigantea	Black Bentgrass	√	√	√	√
Agrostis perennans	**Perenial Bentgrass**	√		√	
Agrostis scabra	**Rough Bentgrass**	√	√	√	√
Agrostis stolonifera	Spreading Bentgrass	√	√	√	√
Ailanthus altissima	Tree-of-heaven	√	√		
Ajuga reptans	Carpet Bugle	√	√		
Alcea rosea	Hollyhock	√	√		
Alisma plantago-aquatica	American Water-plantain	√	√	√	√
Alliaria petiolata	Garlic Mustard	√	√	√	√
Allium schoenoprasum var. schoenoprasum	Wild Chives variety	√	√		
Allium tricoccum	Small White Leek	√	√	√	√

APPENDIX B

VASCULAR PLANTS OF THE NAI STUDY AREA

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Allium vineale	Field Garlic	√	√		
Alnus glutinosa	European Alder	√	√		√
Alnus incana ssp. rugosa	Speckled Alder	√	√	√	√
Alopecurus aequalis	Short-awn Foxtail	√	√	√	√
Alopecurus geniculatus	Geniculate Foxtail	√			
Alopecurus pratensis	Meadow Foxtail	√			
Alyssum alyssoides	Pale Alyssum	√			
Amaranthus albus	White Pigweed	√			
Amaranthus blitoides	Prostrate Amaranth	√	√		
Amaranthus hybridus	Smooth Amaranth	√			
Amaranthus powellii	Green Amaranth	√	√		
Amaranthus retroflexus	Red-root Amaranth	√	√		√
Ambrosia artemisiifolia	Common Ragweed	√	√		√
Ambrosia trifida	Giant Ragweed	√	√		
Amelanchier alnifolia	**Saskatoon Berry**	√			
Amelanchier arborea	Downy Serviceberry	√	√	√	√
Amelanchier laevis	Allegheny Serviceberry	√	√	√	√
Amelanchier spicata	Low Serviceberry	√	√		
Amelanchier stolonifera	**Running Serviceberry**	√	√		
Amphicarpaea bracteata	American Hog-peanut	√	√		
Anagallis arvensis	Scarlet Pimpernel	√	√		
Anaphalis margaritacea	Pearly Everlasting	√	√	√	√
Anchusa arvensis	Small Bugloss	√			
Andromeda polifolia ssp. glaucophylla	**Bog Rosemary**	√			√
Andropogon gerardii	**Big Bluestem**	√			
Androsace septentrionalis	**Pygmy-flower Rock-jasmine**	√			
Anemone acutiloba	Liverleaf	√	√	√	√
Anemone americana	**Round-lobed Hepatica**	√			√
Anemone canadensis	Canada Anemone	√	√	√	√
Anemone cylindrica	**Long-fruited Anemone**	√	√	√	√
Anemone multifida	**Early Anemone**	√			
Anemone quinquefolia	Wood Anemone	√	√	√	√
Anemone virginiana (no var. recorded)	Virginia Anemone	√	√	√	√
Anemone virginiana var. virginiana	Tall Thimbleweed variety	√	√		
Angelica atropurpurea	**Great Angelica**	√	√		
Antennaria howellii ssp. canadensis	Canada Pussy-toes	√			
Antennaria howellii ssp. howellii	Howell's Pussy-toes	√			
Antennaria howellii ssp. neodioica	Small Pussy-toes	√			
Antennaria howellii ssp. petaloidea	Sessile-leaved Pussy-toes	√	√		√
Antennaria neglecta	Field Pussy-toes	√	√	√	√
Antennaria parlinii ssp. fallax	Parlin's Pussy-toes subspecies	√	√		
Anthemis arvensis	Corn Camomile	√			
Anthemis cotula	Mayweed	√	√		
Anthemis tinctoria	Golden Camomile		√		
Anthoxanthum odoratum ssp. odoratum	Sweet Vernal Grass	√			

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Anthriscus sylvestris	Wild Chervil	√			
Antirrhinum majus	Garden Snapdragon		√		
Apios americana	**American Groundnut**	√			
Apocynum androsaemifolium ssp. androsaemifolium	Spreading Dogbane subspecies	√	√	√	√
Apocynum cannabinum	Clasping-leaf Dogbane	√	√	√	√
Aquilegia canadensis	Wild Columbine	√	√	√	√
Aquilegia vulgaris	European Columbine	√			√
Arabidopsis thaliana	Mouse-ear Cress	√			
Arabis canadensis	**Sicklepod**	√			
Arabis glabra	**Tower-mustard**	√	√		
Arabis hirsuta ssp. pycnocarpa	Hairy Rock-cress variety	√			
Arabis laevigata	**Smooth Rock-cress**	√			
Aralia hispida	**Bristly Sarsaparilla**	√			
Aralia nudicaulis	Wild Sarsaparilla	√	√	√	√
Aralia racemosa ssp. racemosa	Spikenard	√	√	√	√
Arceuthobium pusillum	**Dwarf Mistletoe**	√			
Arctium lappa	Greater Burdock	√	√	√	√
Arctium minus	common burdock		√		
Arctium minus ssp. minus	Common Burdock	√	√	√	√
Arenaria serpyllifolia	Thyme-leaf Sandwort	√	√		√
Arethusa bulbosa	**Swamp-pink**	√			
Arisaema triphyllum ssp. triphyllum	Jack-in-the-pulpit subspecies	√	√	√	√
Armoracia rusticana	Horseradish	√			
Aronia melanocarpa	**Black Chokeberry**	√	√		√
Arrhenatherum elatius	Tall Oatgrass	√			
Artemisia abrotanum	Southernwood	√			
Artemisia annua	Annual Wormwood	√			
Artemisia biennis	Biennial Wormwood	√	√		
Artemisia campestris ssp. caudata	**Beach Wormwood**	√	√		
Artemisia ludoviciana	White Sagebrush	√			
Artemisia pontica	Roman Wormwood	√			
Artemisia vulgaris	Common Wormwood	√	√		
Aruncus dioicus	Bride's Feathers	√		√	
Asarum canadense	Canada Wild-ginger	√	√	√	√
Asclepias exaltata	**Poke Milkweed**	√	√		
Asclepias incarnata ssp. incarnata	Swamp Milkweed	√	√	√	√
Asclepias syriaca	Common Milkweed	√	√	√	√
Asclepias tuberosa	**Butterfly Milkweed**	√	√		
Asparagus officinalis	Garden Asparagus	√	√	√	√
Asplenium platyneuron	**Ebony Spleenwort**	√	√		√
Asplenium rhizophyllum	**Walking Fern**	√	√		
Asplenium scolopendrium var. americanum	**American Hart's-tongue Fern**	√	√		
Asplenium trichomanes (not taken to subspecies)	Maidenhair Spleenwort		√	√	
Asplenium trichomanes ssp. quadrivalens	Limestone Maidenhair Spleenwort	√			

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Asplenium trichomanes ssp. trichomanes	**Maidenhair Spleenwort subspecies**	√	√		
Asplenium trichomanes-ramosum	**Green Spleenwort**	√			
Astragalus canadensis	**Canadian Milkvetch**	√	√		
Astragalus neglectus	**Cooper's Milkvetch**	√	√		
Athyrium filix-femina var. angustum	Subarctic Ladyfern	√	√	√	√
Atriplex patula	Halberd-leaf Saltbush	√	√		
Aureolaria flava var. flava	**Yellow False-foxglove variety**	√			
Aureolaria flava var. macrantha	**Yellow False-foxglove variety**	√			
Avena fatua	Wild Oat	√			
Avena sativa	Cultivated Oat	√	√		
Baptisia australis	Blue Wild Indigo		√		
Barbarea vulgaris	Yellow Rocket	√	√		√
Bellis perennis	Lawn Daisy	√			
Berberis aquifolium	Oregon Grape	√			
Berberis thunbergii	Japanese Barberry	√	√	√	√
Berberis vulgaris	European Barberry	√	√	√	√
Berteroa incana	Hoary False-alyssum	√			
Betula alleghaniensis	Yellow Birch	√	√	√	√
Betula papyrifera	Paper Birch	√	√	√	√
Betula pendula	European White Birch	√	√		
Betula pumila	**Swamp Birch**	√			
Bidens cernua	Nodding Beggar-ticks	√	√	√	√
Bidens discoidea	**Swamp Beggar-ticks**	√			
Bidens frondosa	Devil's Beggar-ticks	√	√	√	√
Bidens polylepis	Awnless Beggar-ticks	√			
Bidens tripartita	Three-Lobe Beggar-ticks	√	√	√	√
Bidens vulgata	Tall Beggar-ticks	√	√		
Boehmeria cylindrica	False Nettle	√	√		√
Bolboschoenus fluviatilis	**River Bulrush**	√	√		
Botrychium dissectum	**Cutleaf Grape-fern**	√	√		√
Botrychium lanceolatum ssp. angustisegmentum	**Lance-leaf Grape-fern**	√			
Botrychium matricariifolium	**Daisy-leaf Grape-fern**	√			
Botrychium multifidum	**Leathery Grape-fern**	√			
Botrychium simplex	**Least Grape-fern**	√	√		
Botrychium virginianum	Rattlesnake Fern	√	√		√
Brachyelytrum erectum	**Bearded Shorthusk**	√	√		√
Brasenia schreberi	**Watershield**	√			√
Brassica juncea	Chinese Mustard	√			
Brassica nigra	Black Mustard	√	√		√
Brassica rapa	Bird's Rape	√	√		
Bromus ciliatus	Fringed Brome	√	√	√	√
Bromus commutatus	Hairy Brome	√	√		
Bromus hordeaceus ssp. hordeaceus	Soft Brome	√			
Bromus inermis ssp. inermis	Awnless Brome	√	√	√	√
Bromus japonicus	Japanese Brome	√			

APPENDIX B

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Bromus latiglumis	Broad-glumed Brome	√	√		
Bromus secalinus	Rye Brome	√			
Bromus tectorum	Cheat Grass	√	√		
Buglossoides arvensis	Corn-gromwell	√			
Butomus umbellatus	Flowering-rush	√	√		
Cakile edentula	**American Sea-rocket**	√			
Calamagrostis canadensis	Canada Blue-joint	√	√	√	√
Calamagrostis stricta ssp. inexpansa	Narrow-spike Small-reedgrass	√			
Calla palustris	Water Arum	√	√	√	√
Callitriche hermaphroditica	Autumnal Water-starwort	√			
Callitriche palustris	**Vernal Water-starwort**	√	√		
Calopogon tuberosus	**Tuberous Grass-pink**	√			
Caltha palustris	Marsh Marigold	√	√	√	√
Calystegia sepium	Wild Morning Glory	√	√		√
Calystegia spithamaea (L.) Pursh ssp. spithamaea	Low Bindweed	√			
Calystegia spithamaea ssp. spithamaea	Low False Bindweed	√	√		
Camelina microcarpa	Little-seed False-flax	√	√		
Campanula aparinoides	**Marsh Bellflower**	√		√	√
Campanula rapunculoides	Creeping Bellflower	√	√	√	√
Campanula rotundifolia	**American Harebell**	√	√		
Cannabis sativa	Marijuana	√	√		
Capsella bursa-pastoris	Common Shepherd's Purse	√	√		
Caragana arborescens	Siberian Peashrub	√			
Cardamine bulbosa	**Bulbous Bitter-cress**	√	√		√
Cardamine concatenata	Cutleaf Toothwort	√	√		√
Cardamine diphylla	Two-leaf Toothwort	√	√	√	√
Cardamine douglassii	**Limestone Bitter-cress**	√	√		
Cardamine hirsuta	Hairy Bitter-cress	√			√
Cardamine impatiens	Narrow-leaf Bitter-cress	√			
Cardamine pensylvanica	Pennsylvania Bitter-cress	√	√		√
Cardamine pratensis var. angustifolia*	**Cuckoo Flower variety**	√			
Cardamine pratensis var. pratensis*	**Cuckoo Flower variety**	√			
Cardamine x maxima	Hybrid Toothwort	√	√		
Carduus acanthoides	Spiny Plumeless-thistle	√			
Carduus crispus	Curled Plumeless-thistle	√			
Carduus nutans	Musk Thistle	√	√	√	√
Carex albursina	White Bear Sedge	√	√	√	√
Carex alopecoidea	Foxtail Sedge	√	√	√	
Carex amphibola	Narrowleaf Sedge	√			
Carex aquatilis	**Water Sedge**	√	√		√
Carex arctata	Black Sedge	√	√	√	√
Carex atherodes	**Awned Sedge**	√	√		√
Carex aurea	Golden-fruited Sedge	√	√	√	√
Carex backii	Rocky Mountain Sedge	√	√		
Carex bebbii	Bebb's Sedge	√	√	√	√
Carex blanda	Woodland Sedge	√	√	√	√

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Carex bromoides	**Brome-like Sedge**	√	√		
Carex brunnescens ssp. brunnescens	**Brownish Sedge subspecies**	√			√
Carex buxbaumii	**Buxbaum's Sedge**	√			
Carex canescens ssp. canescens	**Silvery Sedge**	√	√		√
Carex castanea	**Chestnut-colored Sedge**	√			
Carex cephaloidea	**Thinleaf Sedge**	√		√	√
Carex cephalophora	**Oval-leaved Sedge**	√	√		
Carex chordorrhiza	**Creeping Sedge**	√			√
Carex communis	Fibrous-root Sedge	√	√	√	√
Carex comosa	Bristly Sedge	√	√	√	√
Carex conjuncta	Soft Fox Sedge	√			
Carex crawfordii	**Crawford Sedge**	√			
Carex crinita	Fringed Sedge	√	√	√	√
Carex cristatella	Crested Sedge	√	√	√	√
Carex cryptolepis	**Northeastern Sedge**	√	√		√
Carex deweyana	Short-scale Sedge	√	√	√	√
Carex diandra	Lesser Panicled Sedge	√	√		√
Carex digitalis	**Slender Wood Sedge**	√			
Carex disperma	Softleaf Sedge	√	√	√	√
Carex eburnea	Ebony Sedge	√	√		√
Carex echinata ssp. echinata	**Little Prickly Sedge subspecies**	√			√
Carex flava	Yellow Sedge	√	√	√	√
Carex foenea	Fernald's Hay Sedge	√			
Carex formosa	Handsome Sedge	√			√
Carex gracilescens	**Slender Sedge**	√			
Carex gracillima	Graceful Sedge	√	√	√	√
Carex granularis	Meadow Sedge	√	√	√	√
Carex grayi	**Asa Gray Sedge**	√			
Carex grisea	**Inflated Narrow-leaf Sedge**	√			
Carex hirtifolia	Pubescent Sedge	√	√		√
Carex hitchcockiana	Hitchcock's Sedge	√	√		√
Carex hystericina	Porcupine Sedge	√	√	√	√
Carex interior	Inland Sedge	√	√	√	√
Carex intumescens	Bladder Sedge	√	√	√	√
Carex lacustris	Lake-bank Sedge	√	√	√	√
Carex laevivaginata	**Smooth-sheath Sedge**	√	√	√	√
Carex lasiocarpa	**Slender Sedge**	√	√		√
Carex laxiculmis var. copulata*	**Spreading Sedge variety**	√	√		
Carex laxiculmis var. laxiculmis*	**Spreading Sedge variety**	√	√		√
Carex laxiflora	Loose-flowered Sedge	√	√	√	√
Carex leptalea ssp. leptalea	Bristly-stalk Sedge subspecies	√	√	√	√
Carex leptonervia	Finely-nerved Sedge	√	√	√	√
Carex limosa	**Mud Sedge**	√			√
Carex lupulina	Hop Sedge	√	√	√	√
Carex lurida	**Sallow Sedge**	√			√
Carex magellanica ssp. irrigua	**Boreal Bog Sedge**	√	√		√

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Carex merritt-fernaldii	**Merrit Fernald's Sedge**	√			
Carex molesta	Troublesome Sedge	√	√	√	
Carex muehlenbergii var. muhlenbergii	**Muhlenberg's Sedge**	√			
Carex normalis	Greater Straw Sedge	√			
Carex oligosperma	Few-seeded Sedge	√			
Carex pallescens	**Pale Sedge**	√			
Carex pauciflora	**Few-flowered Sedge**	√			
Carex peckii	White-tinged Sedge	√	√		√
Carex pedunculata	Longstalk Sedge	√	√	√	√
Carex pellita	**Woolly Sedge**	√		√	√
Carex pensylvanica	Pennsylvania Sedge	√	√	√	√
Carex plantaginea	Plantain-leaved Sedge	√	√	√	√
Carex platyphylla	Broad-leaved Sedge	√	√	√	√
Carex praegracilis	Clustered Field Sedge	√			
Carex prairea	**Prairie Sedge**	√		√	√
Carex prasina	**Drooping Sedge**	√			
Carex projecta	Necklace Sedge	√	√	√	√
Carex pseudo-cyperus	Cyperus-like Sedge	√	√	√	√
Carex radiata	Stellate Sedge	√	√	√	√
Carex retrorsa	Retrorse Sedge	√	√	√	√
Carex rosea	Rosy Sedge	√	√	√	√
Carex scabrata	Rough Sedge	√	√	√	√
Carex schweinitzii	Schweinitz's Sedge	√			
Carex scoparia	**Pointed Broom Sedge**	√	√		√
Carex siccata	**Dry-spike Sedge**	√			
Carex sparganioides	Burr Reed Sedge	√	√	√	√
Carex spicata	Prickly Sedge	√	√		√
Carex sprengelii	**Longbeak Sedge**	√	√	√	√
Carex stipata	Stalk-grain Sedge	√	√	√	√
Carex stricta	Tussock Sedge	√	√	√	√
Carex sychnocephala	**Many-headed Sedge**	√			
Carex tenera	Slender Sedge	√	√	√	√
Carex tetanica	Rigid Sedge	√	√		
Carex tonsa var. rugosperma	Umbel-like Sedge	√			
Carex torta	**Twisted Sedge**	√			
Carex tribuloides	**Blunt Broom Sedge**	√			
Carex trisperma (no var. recorded)	Three-seed Sedge	√	√	√	
Carex trisperma var. trisperma	**Three-seed Sedge subspecies**	√	√		√
Carex tuckermanii	Tuckerman Sedge	√	√	√	√
Carex utriculata	Northwest Territory Sedge	√	√	√	√
Carex vaginata	**Sheathed Sedge**	√			
Carex vesicaria	**Inflated Sedge**	√		√	√
Carex viridula ssp. viridula	**Little Green Sedge subspecies**	√	√		
Carex vulpinoidea	Fox Sedge	√	√	√	√
Carex woodii	**Pretty Sedge**	√	√		√
Carpinus betulus	European Hornbeam	√			
Carpinus caroliniana	American Hornbeam	√	√		√

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Carum carvi	Common Caraway	√			
Carya cordiformis	Bitter-nut Hickory	√	√		√
Carya ovata	Shag-bark Hickory	√	√		
Castanea dentata	American Chestnut	√			
Catalpa speciosa	Northern Catalpa	√	√		
Caulophyllum giganteum	**Giant Blue Cohosh**	√	√	√	√
Caulophyllum thalictroides	Blue Cohosh	√	√	√	√
Ceanothus americanus	**New Jersey Tea**	√			
Celastrus orbiculata	Oriental Bittersweet	√			
Celastrus scandens	Climbing Bittersweet	√	√		√
Celtis occidentalis	Common Hackberry	√	√		
Cenchrus longispinus	Long-spine Sandbur	√			
Centaurea biebersteinii	Spotted Starthistle	√	√	√	√
Centaurea cyanus	Corn-flower	√	√		
Centaurea jacea	Brown Starthistle	√			
Centaurea nigra	Black Knapweed	√	√		
Centaurea x pratensis	Meadow Knapweed	√			
Centaurium pulchellum	Branching Centaury	√			
Cephalanthus occidentalis	**Common Buttonbush**	√	√		
Cerastium arvense ssp. arvense	Field Mouse-ear Chickweed subspecies	√	√		
Cerastium fontanum	Common Mouse-ear Chickweed	√	√	√	
Cerastium semidecandrum	Five-stamen Mouse-ear Chickweed	√			
Cerastium tomentosum	Snow-in-summer	√	√		
Ceratophyllum demersum	**Common Hornwort**	√	√	√	√
Cercis canadensis	Redbud	√			
Chaenomeles sp.	Flowering Quince species	√			
Chaenorhinum minus	Common Dwarf Snapdragon	√			
Chamaecyparis nootkatensis	Nootka False Cypress		√		
Chamaedaphne calyculata	**Leatherleaf**	√	√		√
Chamaesyce glyptosperma	Corrugate-seed Broomspurge	√	√		
Chamaesyce maculata	Spotted Spurge	√	√		
Chamaesyce vermiculata	Worm Seeded Spurge	√			
Chelidonium majus	Greater Celadine	√	√	√	√
Chelone glabra	White Turtlehead	√	√	√	√
Chenopodium album var. album	Lambsquarters	√	√	√	
Chenopodium bonus-henricus	Good-king-henry	√			
Chenopodium botrys	Jerusalem-oak	√			
Chenopodium capitatum	**Strawberry Goosefoot**	√			
Chenopodium glaucum	Oakleaf Goosefoot	√	√		
Chenopodium rubrum	Coast-blite Goosefoot	√	√		
Chenopodium simplex	Giant-seed Goosefoot	√	√		
Chimaphila umbellata ssp. cisatlantica	**Pipsissewa**	√			
Chrysanthemum leucanthemum	Oxeye Daisy	√	√	√	√
Chrysosplenium americanum	**American Golden-saxifrage**	√	√		√
Cichorium intybus	Chicory	√	√	√	√
Cicuta bulbifera	Bulb-bearing Water-hemlock	√	√	√	√
Cicuta maculata	Spotted Water-hemlock	√	√	√	√

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Cinna arundinacea	**Stout Wood Reedgrass**	√			
Cinna latifolia	Slender Wood Reedgrass	√	√	√	√
Circaea alpina	Small Enchanter's Nightshade	√	√	√	√
Circaea lutetiana ssp. canadensis	Intermediate Enchanter's Nightshade	√	√	√	√
Cirsium arvense	Creeping Thistle	√	√	√	√
Cirsium muticum	**Swamp Thistle**	√		√	
Cirsium vulgare	Bull Thistle	√	√	√	√
Cladium mariscoides	Twig Rush	√			√
Claytonia caroliniana	Carolina Spring-beauty	√	√		
Claytonia virginica	Narrow-leaved Spring-beauty	√	√		√
Clematis occidentalis var. occidentalis	**Western Blue Virgin-bower**	√	√		
Clematis orientalis	Western Clematis		√		
Clematis virginiana	Virginia Virgin-bower	√	√	√	√
Clinopodium vulgare	Wild Basil	√	√	√	√
Clintonia borealis	Blue Bead-lily	√	√	√	√
Collinsonia canadensis	**Canada Horse-balm**	√	√		√
Comandra umbellata	**Umbellate Bastard Toad-flax**	√			
Commelina communis	Asiatic Dayflower	√			
Comptonia peregrina	**Sweet Fern**	√			
Conioselinum chinense	Hemlock Parsley		√		
Conium maculatum	Poison-hemlock	√	√		
Conopholis americana	**Squaw-root**	√	√		
Conringia orientalis	Hare's-ear Mustard	√			
Consolida ajacis	Doubtful Larkspur	√			
Convallaria majalis	European Lily-of-the-valley	√	√	√	√
Convolvulus arvensis	Field Bindweed	√	√	√	
Conyza canadensis	Canadian Horseweed	√	√	√	√
Coptis trifolia	Goldthread	√	√	√	√
Corallorhiza maculata	**Spotted Coralroot**	√			
Corallorhiza odontorhiza	Autumn Coralroot	√			
Corallorhiza striata	**Striped Coralroot**	√			
Corallorhiza trifida	**Early Coralroot**	√	√		√
Coreopsis grandiflora	Large-flowered Tickseed	√	√		
Cornus alba	Tatarian Dogwood	√			
Cornus alternifolia	Alternate-leaf Dogwood	√	√	√	√
Cornus amomum ssp. obliqua	Silky Dogwood	√	√		√
Cornus canadensis	Bunchberry	√	√	√	√
Cornus florida	Eastern Flowering Dogwood	√			
Cornus foemina ssp. racemosa	Stiff Dogwood	√	√		
Cornus rugosa	Roundleaf Dogwood	√	√	√	√
Cornus stolonifera	Red-osier Dogwood	√	√	√	√
Coronilla varia	Common Crown-vetch	√	√	√	
Corydalis aurea ssp. aurea	**Scrambled Eggs**	√			
Corylus americana	American Hazelnut	√			
Corylus cornuta	Beaked Hazelnut	√	√	√	√
Crataegus brainerdii	Brainerd's Hawthorn	√			
Crataegus calpodendron	**Pear Hawthorn**	√			
Crataegus chrysocarpa	Fireberry Hawthorn	√			
Crataegus corusca	**Shiningbranch Hawthorn**	√			

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Crataegus crus-galli	Cockspur Hawthorn	√			
Crataegus holmesiana	Holmes' Hawthorn	√			
Crataegus macracantha	Long-spined Hawthorn	√	√		
Crataegus macrosperma	**Bigfruit Hawthorn**	√	√		
Crataegus mollis	Downy Hawthorn	√			
Crataegus monogyna	English Hawthorn	√	√	√	√
Crataegus pedicellata	Scarlet Hawthorn	√			
Crataegus pringlei	**Pringle's Hawthorn**	√	√		
Crataegus pruinosa	**Frosted Hawthorn**	√			
Crataegus punctata	Dotted Hawthorn	√	√	√	√
Crataegus schuettei	**Schuette's Hawthorn**	√			
Crataegus submollis	**Northern Downy Hawthorn**	√			
Crataegus succulenta	**Fleshy Hawthorn**	√	√		
Crepis tectorum	Narrow-leaf Hawksbeard	√			√
Cryptotaenia canadensis	Canada Honewort	√	√		√
Cuscuta gronovii	Gronovius Dodder	√	√		
Cycloloma atriplicifolium	Winged Pigweed	√			
Cymbalaria muralis	Kenilworth Ivy	√			
Cynanchum nigrum	Black Swallow-wort	√	√		
Cynanchum rossicum	European Swallow-wort	√	√	√	√
Cynoglossum boreale	**Northern Wild Comfrey**	√			
Cynoglossum officinale	Common Hound's-tongue	√	√	√	√
Cynosurus cristatus	Crested Dog-tail Grass	√			
Cyperus bipartitus	**Slender Flatsedge**	√			
Cyperus esculentus	Chufa Flatsedge	√			
Cyperus lupulinus ssp. macilentus	**Great Plains Flatsedge subspecies**	√			
Cyperus odoratus	**Rusty Flatsedge**	√			
Cyperus strigosus	**Straw-colored Flatsedge**	√	√		
Cypripedium acaule	**Pink Lady's-slipper**	√			
Cypripedium calceolus (no var. recorded)	Yellow Lady's-slipper	√	√	√	√
Cypripedium calceolus var. parviflorum	Smaller Yellow Lady's-slipper	√	√		
Cypripedium parviflorum var. pubescens	Large Yellow Lady's-slipper	√	√		√
Cypripedium parviflorum var. makasin	Small Yellow Lady's-slipper	√	√		
Cypripedium reginae	**Showy Lady's-slipper**	√	√	√	√
Cystopteris bulbifera	Bulblet Fern	√	√	√	√
Cystopteris fragilis	Fragile Fern	√	√		
Cystopteris tenuis	Upland Brittle Bladder Fern	√	√	√	√
Dactylis glomerata	Orchard Grass	√	√	√	√
Dalibarda repens	**Robin Runaway**	√	√	√	√
Danthonia spicata	Poverty Oatgrass	√	√	√	√
Daphne mezereum	February Daphne	√		√	√
Datura stramonium	Jimson Weed	√	√		
Daucus carota	Queen Anne's Lace	√	√	√	√
Decodon verticillatus	**Hairy Swamp Loosestrife**	√	√	√	
Dennstaedtia punctilobula	**Eastern Hay-scented Fern**	√			
Deparia acrostichoides	Silvery Spleenwort	√	√	√	√

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Deschampsia cespitosa ssp. cespitosa	Tufted Hairgrass				√
Deschampsia cespitosa ssp. parviflora	Small-flowered Tufted Hairgrass	√			√
Descurainia sophia	Herb Sophia	√			
Desmodium canadense	Showy Tick-trefoil	√	√		
Desmodium glutinosum	Pointedleaf Tick-trefoil	√	√		
Desmodium nudiflorum	**Bare-stemmed Tick-trefoil**	√			
Dianthus armeria	Deptford-pink	√	√	√	√
Dianthus barbatus	Sweet-william		√		
Dianthus deltoides	Maiden-pink	√			
Dicentra canadensis	Squirrel-corn	√	√	√	√
Dicentra cucullaria	**Dutchman's Breeches**	√	√	√	
Dichanthelium acuminatum var. fasciculatum	Western Panic Grass	√	√		√
Diervilla lonicera	Northern Bush-honeysuckle	√	√	√	√
Digitaria ischaemum	Smooth Crabgrass	√			
Digitaria sanguinalis	Hairy Crabgrass	√	√		
Diphasiastrum digitatum	Fan Clubmoss	√			√
Diplazium pycnocarpon	**Glade Fern**	√	√		√
Diplotaxis tenuifolia	Slime-leaf Wallrocket	√	√		
Dipsacus fullonum ssp. sylvestris	Teasel	√	√		√
Dirca palustris	Eastern Leatherwood	√	√	√	√
Doellingeria umbellata var. umbellata	Flat-top White Aster	√	√		
Drosera intermedia	**Spoon-leaved Sundew**	√			
Drosera rotundifolia	**Roundleaf Sundew**	√	√		√
Dryopteris carthusiana	Spinulose Shield-fern	√	√	√	√
Dryopteris clintoniana	Clinton Woodfern	√	√	√	√
Dryopteris cristata	Crested Shield-fern	√	√	√	√
Dryopteris filix-mas	**Male Fern**	√	√		√
Dryopteris goldiana	**Goldie's Woodfern**	√	√		
Dryopteris intermedia	Evergreen Woodfern	√	√	√	√
Dryopteris marginalis	Marginal Woodfern	√	√	√	√
Dryopteris x boottii	Boott's Woodfern	√			
Dryopteris x triploidea	Woodfern	√			
Dryopteris x uliginosa	Spinulose-crested Hybrid Woodfern	√			
Dulichium arundinaceum	**Three-way Sedge**	√	√	√	√
Echinacea purpurea	Eastern Purple Coneflower	√	√		
Echinochloa crusgalli	Barnyard Grass	√	√		√
Echinochloa microstachya	Barnyard Grass	√	√		
Echinocystis lobata	Wild Mock-cucumber	√	√	√	√
Echinops sphaerocephalus	Great Globe-thistle	√			
Echium vulgare	Common Viper's-bugloss	√	√	√	√
Elaeagnus angustifolia	Russian Olive	√	√	√	
Elaeagnus umbellata	Autumn Olive	√		√	√
Eleocharis acicularis	**Least Spike-rush**	√	√	√	
Eleocharis erythropoda	Bald Spike-rush	√	√	√	√
Eleocharis intermedia	**Matted Spike-rush**	√			√

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Eleocharis obtusa	Blunt Spike-rush	√	√		√
Eleocharis palustris	Common Spike-rush	√			
Eleocharis pauciflora	Fewflower Spike-rush	√	√		
Eleocharis smallii	Creeping Spike-rush	√	√	√	√
Eleutherococcus sieboldianus	Five-leaved Aralia	√			
Elodea canadensis	Canada Waterweed	√	√	√	
Elodea nuttallii	Nuttall Waterweed	√	√		
Elymus canadensis	**Canada Wild-rye**	√	√		
Elymus hystrix	Bottlebrush Grass	√	√		√
Elymus repens	Quackgrass	√	√	√	√
Elymus riparius	**River Wild-rye**	√	√		
Elymus trachycaulus	**Slender Wheatgrass**	√			
Elymus villosus	**Slender Wild-rye**	√			
Elymus virginicus var. virginicus	Virginia Wild-rye	√	√	√	√
Elymus wiegandii	**Wiegand's Wild-rye**	√			
Epifagus virginiana	Beechdrops	√	√	√	√
Epigaea repens	**Trailing Arbutus**	√			
Epilobium angustifolium	Fireweed	√	√		√
Epilobium ciliatum ssp. ciliatum	Hairy Willow-herb subspecies	√	√	√	√
Epilobium coloratum	**Purple-leaf Willow-herb**	√	√	√	√
Epilobium hirsutum	Great-hairy Willow-herb	√	√	√	√
Epilobium leptophyllum	Linear-leaved Willow-herb	√	√	√	√
Epilobium palustre	Marsh Willow-herb			√	
Epilobium parviflorum	Small-flower Willow-herb	√	√	√	√
Epilobium strictum	Downy Willow-herb	√			√
Epipactis helleborine	Eastern Helleborine	√	√	√	√
Equisetum arvense	Field Horsetail	√	√	√	√
Equisetum fluviatile	Water Horsetail	√	√	√	√
Equisetum hyemale ssp. affine	Scouring Rush	√	√	√	√
Equisetum laevigatum	**Smooth Scouring Rush**	√			
Equisetum palustre	**Marsh Horsetail**	√	√	√	√
Equisetum pratense	**Meadow Horsetail**	√	√	√	√
Equisetum scirpoides	Dwarf Scouring Rush	√	√	√	√
Equisetum sylvaticum	**Woodland Horsetail**	√	√	√	√
Equisetum variegatum var. variegatum	Variegated Scouring Rush	√	√	√	√
Eragrostis cilianensis	Stinkgrass	√			
Eragrostis hypnoides	**Teal Love Grass**	√			
Eragrostis minor	Little Love Grass	√			
Eragrostis pectinacea var. pectinacea	Tufted Love Grass	√			
Erechtites hieraciifolia	**Burnweed**	√			
Erigenia bulbosa	**Harbinger-of-spring**	√			
Erigeron annuus	Eastern Daisy Fleabane	√	√	√	√
Erigeron philadelphicus ssp. philadelphicus	Philadelphia Fleabane	√	√	√	√
Erigeron pulchellus	**Robin's Plantain Fleabane**	√	√		
Erigeron strigosus	Rough Fleabane	√	√		√
Eriophorum gracile	**Slender Cotton-grass**	√			√
Eriophorum vaginatum ssp. spissum	**Dense Cotton-grass**	√			√

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Eriophorum virginicum	**Tawny Cotton-grass**	√			√
Eriophorum viridi-carinatum	**Thinleaf Cottonsedge**	√	√		√
Erodium cicutarium	Pin Clover	√			
Erophila verna	Spring Whitlow-grass	√			
Erucastrum gallicum	Common Dogmustard	√	√		
Eryngium planum	Plain Coyote-thistle	√			
Erysimum cheiranthoides	Worm-seed Mustard	√	√		
Erysimum hieraciifolium	European Wallflower	√			
Erysimum inconspicuum	Small-flower Prairie Wallflower	√			
Erythronium albidum	**White Trout-lily**	√	√		
Erythronium americanum ssp. americanum	Yellow Trout-lily	√	√		√
Euonymus obovatus	Running Strawberry-bush	√	√		√
Euonymus alatus	Winged Spindle-tree	√			√
Euonymus europaea	European Spindle-tree	√			
Euonymus fortunei	Winter-creeper	√	√		
Eupatorium maculatum ssp. maculatum	Spotted Joe-pye Weed	√	√	√	√
Eupatorium perfoliatum	Common Boneset	√	√	√	√
Eupatorium rugosum	White Snakeroot	√	√	√	√
Euphorbia cyparissias	Cypress Spurge	√	√	√	
Euphorbia dentata	Toothed Spurge	√			
Euphorbia esula	Leafy Spurge	√			
Euphorbia helioscopia	Summer Spurge	√			
Euphorbia marginata	Snow-on-the-mountain	√			
Euphorbia platyphyllos	Broad-leaf Spurge	√			
Eurybia macrophylla	Large-leaf Wood Aster	√	√	√	√
Euthamia graminifolia	Flat-top Goldentop	√	√	√	√
Fagopyrum esculentum	Buckwheat	√			
Fagus grandifolia	American Beech	√	√	√	√
Fagus sylvatica	European Beech	√	√		
Festuca arundinacea	Tall Fescue	√	√	√	
Festuca filiformis	Hair Fescue	√			
Festuca pratensis	Meadow Fescue	√	√	√	√
Festuca rubra ssp. rubra	Red Fescue subspecies	√	√		
Festuca subverticillata	Nodding Fescue	√	√		√
Festuca trachyphylla	Hard Fescue	√			
Filipendula ulmaria ssp. ulmaria	Queen-of-the-meadow	√			
Filipendula vulgaris	Dropwort	√			
Forsythia suspensa	Weeping Forsythia	√			
Forsythia viridissima	Green-stem Forsythia	√	√		
Fragaria vesca ssp. americana	Woodland Strawberry	√	√	√	√
Fragaria virginiana ssp. virginiana	Common Strawberry	√	√	√	√
Fraxinus americana	White Ash	√	√	√	√
Fraxinus excelsior	European Ash	√	√		
Fraxinus nigra	Black Ash	√	√	√	√
Fraxinus pennsylvanica (no var. recorded)	Green or Red Ash	√	√	√	
Fraxinus pennsylvanica var. pennsylvanica	Red Ash	√	√		√

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Fraxinus pennsylvanica var. subintegerrima	Green Ash variety	√	√	√	√
Fumaria officinalis	Drug Fumitory	√			
Galanthus nivalis	Snowdrop	√			
Galearis spectabilis	**Showy Orchis**	√			
Galeopsis tetrahit	Brittle-stem Hempnettle	√	√	√	√
Galinsoga parviflora	Small-flower Quickweed	√			
Galinsoga quadriradiata	Fringed Quickweed	√			
Galium aparine	Catchweed Bedstraw	√	√	√	√
Galium asprellum	Rough Bedstraw	√	√	√	√
Galium boreale	**Northern Bedstraw**	√			√
Galium circaezans	**Wild Licorice**	√	√		√
Galium labradoricum	**Northern Bog Bedstraw**	√			
Galium lanceolatum	**Torrey's Wild Licorice**	√			
Galium mollugo	False Baby's Breath	√	√	√	√
Galium obtusum	Blunt-leaf Bedstraw	√	√		
Galium odoratum	Sweet Bedstraw	√			√
Galium palustre	Marsh Bedstraw	√	√	√	√
Galium tinctorium	**Stiff Marsh Bedstraw**	√	√		√
Galium trifidum ssp. trifidum	Small Bedstraw	√	√	√	√
Galium triflorum	Sweet-scent Bedstraw	√	√	√	√
Galium verum	Yellow Spring Bedstraw	√	√		
Gaultheria hispidula	**Creeping Snowberry**	√	√	√	√
Gaultheria procumbens	Eastern Teaberry	√	√	√	√
Gaylussacia baccata	**Black Huckleberry**	√			√
Gentiana rubricaulis	**Closed Gentian**	√			
Gentianopsis crinita	**Fringed Gentian**	√	√		
Geranium maculatum	Wild Crane's-bill	√	√		√
Geranium robertianum	Herb-robert	√	√	√	√
Geum aleppicum	Yellow Avens	√	√	√	√
Geum canadense	White Avens	√	√	√	√
Geum laciniatum	Rough Avens	√	√	√	
Geum macrophyllum	Large-leaved Avens	√	√		
Geum rivale	**Purple Avens**	√	√	√	√
Geum urbanum	Urban Avens	√	√		
Ginkgo biloba	Gingko		√		
Glechoma hederacea	Ground Ivy	√	√	√	√
Gleditsia triacanthos	Honey Locust	√	√		
Glyceria borealis	**Small Floating Manna-grass**	√	√	√	√
Glyceria canadensis	**Rattlesnake Manna-grass**	√	√		
Glyceria grandis	American Manna-grass	√	√	√	√
Glyceria maxima	Reed Manna-grass	√	√		√
Glyceria septentrionalis	**Floating Manna-grass**	√	√	√	√
Glyceria striata	Fowl Manna-grass	√	√	√	√
Gnaphalium macounii	**Winged Cudweed**	√			
Gnaphalium obtusifolium	**Fragrant Cudweed**	√			
Gnaphalium uliginosum	Low Cudweed	√	√		
Goodyera pubescens	**Downy Rattlesnake-plantain**	√			
Gratiola neglecta	**Clammy Hedge-hyssop**	√			
Grindelia squarrosa	Broadleaf Gumweed	√	√		
Gymnocarpium dryopteris	Oak Fern	√	√	√	√

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Gymnocladus dioicus	Kentucky Coffee-tree	√			
Gypsophila paniculata	Tall Baby's-breath	√			
Hackelia deflexa	**Northern Stickseed**	√			
Hackelia virginiana	Virginia Stickseed	√	√	√	√
Hamamelis virginiana	American Witch-hazel	√	√	√	√
Hedeoma hispida	**Rough Pennyroyal**	√			
Hedeoma pulegioides	**American Pennyroyal**	√	√		
Hedera helix	English Ivy	√	√		
Hedyotis caerulea	**Bluets**	√			
Hedyotis longifolia	**Longleaf Bluets**	√			
Helianthemum bicknellii	**Plains Frostweed**	√			
Helianthemum canadense	**Canada Frostweed**	√			
Helianthus annuus	Common Sunflower	√	√		
Helianthus decapetalus	**Thin-leaved Sunflower**	√			
Helianthus divaricatus	Woodland Sunflower	√			√
Helianthus pauciflorus ssp. subrhomboideus	Stiff Sunflower subspecies	√			
Helianthus pauciflorus ssp. subrhomboideus	Stiff Sunflower subspecies	√			
Helianthus strumosus	**Pale-leaf Sunflower**	√			
Helianthus tuberosus	Jerusalem Artichoke	√	√		
Heliopsis helianthoides	Ox-eye	√			
Helleborus niger	Black Hellebore				√
Hemerocallis fulva	Orange Daylily	√	√	√	√
Hemerocallis lilioasphodelus	Yellow Daylily	√	√		
Heracleum lanatum	**Cow-parsnip**	√	√	√	
Heracleum mantegazzianum	Giant Hogweed	√	√		
Hesperis matronalis	Dame's Rocket	√	√		√
Heteranthera dubia	**Grassleaf Mud-plantain**	√			
Hibiscus trionum	Flower-of-an-hour	√			
Hieracium aurantiacum	Orange Hawkweed	√	√	√	√
Hieracium caespitosum	Yellow Hawkweed	√	√	√	√
Hieracium kalmii	**Kalm's Hawkweed**	√			
Hieracium lachenalii	Common Hawkweed	√	√		
Hieracium pilosella	Mouseear Hawkweed	√	√		
Hieracium piloselloides	Tall Hawkweed	√	√		
Hieracium praealtum	King Devil	√		√	
Hieracium scabrum	**Rough Hawkweed**	√			
Hieracium x floribundum	Pale Hawkweed	√			
Hippuris vulgaris	**Common Mare's-tail**	√			
Holcus lanatus	Common Velvet Grass	√			
Holosteum umbellatum	Jagged Chickweed	√			
Hordeum jubatum ssp. jubatum	Fox-tail Barley	√	√		
Hordeum vulgare	Common Barley	√			
Hosta sp.	Hosta species	√			
Humulus lupulus var. lupulus	Common Hop	√	√		
Huperzia lucidula	Shining Clubmoss	√	√		√
Hydrocotyle americana	American Marshpennywort	√	√	√	√
Hydrophyllum canadense	**Blunt-leaf Waterleaf**	√	√	√	√
Hydrophyllum virginianum	John's Cabbage	√	√	√	√
Hypericum ascyron	**Great St. John's-wort**	√		√	√

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Hypericum majus	**Larger Canadian St. John's-wort**	√			
Hypericum perforatum	Common St. John's-wort	√	√	√	√
Hypericum punctatum	**Spotted St. John's-wort**	√	√	√	√
Hyssopus officinalis	Hyssop	√			√
Ilex verticillata	Common Winterberry	√	√	√	√
Impatiens capensis	Spotted Touch-me-not	√	√	√	√
Impatiens glandulifera	Ornamental Jewelweed	√	√	√	√
Impatiens pallida	Pale Touch-me-not	√	√		√
Inula britannica	Brittish Yellow-head	√			
Inula helenium	Elecampane Flower	√	√	√	√
Ipomoea hederacea	Morning Glory	√			
Iris germanica	German Iris	√	√		
Iris pseudacorus	Yellow Flag	√	√		√
Iris versicolor	Blue Flag	√	√	√	√
Jeffersonia diphylla	**Twinleaf**	√			
Juglans cinerea	Butternut	√	√	√	√
Juglans nigra	Black Walnut	√	√	√	√
Juncus alpinoarticulatus	**Richardson Rush**	√			√
Juncus articulatus	Jointed Rush	√	√	√	√
Juncus balticus	**Baltic Rush**	√			
Juncus brachycephalus	Small-head Rush	√	√		
Juncus brevicaudatus	**Narrow-panicled Rush**	√			√
Juncus bufonius	Toad Rush	√			√
Juncus canadensis	**Canada Rush**	√			
Juncus compressus	Flattened Rush	√			
Juncus dudleyi	Dudley's Rush	√	√	√	√
Juncus effusus ssp. solutus	Lamp Rush	√	√	√	√
Juncus gerardii	Black-grass Rush	√	√		
Juncus nodosus	Knotted Rush	√	√	√	√
Juncus pylaei	**Common Rush**		√		
Juncus tenuis	Path Rush	√	√	√	√
Juncus torreyi	Torrey's Rush	√	√		
Juniperus communis (no variety recorded)	Ground Juniper	√	√		
Juniperus communis var. depressa	**Dwarf Juniper**	√		√	
Juniperus virginiana	Eastern Red Cedar	√	√	√	
Kalmia polifolia	**Bog Laurel**	√	√		√
Kerria japonica	Japanese Rose	√			
Kochia scoparia	Summer-cypress	√			
Lactuca biennis	**Tall Blue Lettuce**	√	√	√	√
Lactuca canadensis	Canada Lettuce	√	√		√
Lactuca saligna	Willow-leaf Lettuce	√			
Lactuca serriola	Prickly Lettuce	√	√		
Lamium amplexicaule	Henbit	√	√		
Laportea canadensis	Wood Nettle	√	√	√	√
Lappula squarrosa	Bristly Stickseed	√			
Lapsana communis	Common Nipplewort	√	√		√
Larix decidua	European Larch	√	√		√
Larix laricina	American Larch	√	√	√	√

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Lathyrus latifolius	Broad-leaf Peavine	√	√		
Lathyrus palustris	**Vetchling Peavine**	√			
Lathyrus pratensis	Meadow Peavine	√			
Lathyrus tuberosus	Earth-nut Peavine	√	√		
Lechea intermedia	**Narrowleaf Pinweed**	√			
Ledum groenlandicum	**Common Labrador Tea**	√	√		√
Leersia oryzoides	Rice Cutgrass	√	√	√	√
Leersia virginica	**White Grass**	√	√		
Lemna minor	Lesser Duckweed	√	√	√	√
Lemna trisulca	Star Duckweed	√	√	√	√
Leontodon taraxacoides	Lesser Hawkbit	√			
Leonurus cardiaca ssp. cardiaca	Common Motherwort	√	√	√	√
Lepidium campestre	Field Pepper-grass	√	√		
Lepidium densiflorum	Common Pepper-grass	√	√		
Lepidium ruderale	Roadside Pepper-grass	√			
Lepidium sativum	Garden Pepper-grass	√			
Lepidium virginicum	**Poor-man's Pepper-grass**	√			
Lespedeza capitata	**Round-head Bush-clover**	√			
Lespedeza hirta	**Hairy Bush-clover**	√			
Levisticum officinale	Lovage	√			
Liatris aspera var. intermedia	Rough Blazing-star		√		
Liatris cylindracea	Slender Blazing-star		√		
Liatris spicata	Dense Blazing-star		√		
Ligustrum vulgare	European Privet	√	√	√	
Lilium lancifolium	Tiger Lily	√			
Lilium michiganense	Michigan Lily	√	√		√
Linaria genistifolia ssp. dalmatica	Dalmatian Toadflax	√			
Linaria vulgaris	Butter-and-eggs	√	√	√	√
Lindera benzoin	**Spicebush**	√	√		
Lindernia dubia var. dubia	**Yellowseed False Pimpernel**	√	√		
Linnaea borealis ssp. longiflora	Twinflower	√	√	√	√
Linum perenne	Blue Flax	√			
Linum usitatissimum	Common Flax	√			
Liparis loeselii	Loesel's Twayblade	√	√	√	√
Liriodendron tulipifera	Tulip Tree	√			
Listera cordata	**Heartleaf Twayblade**	√			
Listera ovata	Egg-leaf Twayblade	√			√
Lithospermum officinale	European Gromwell	√	√	√	√
Lobelia cardinalis	**Cardinal Flower**	√	√		√
Lobelia inflata	Indian-tobacco	√	√	√	√
Lobelia kalmii	**Kalm's Lobelia**	√			√
Lobelia siphilitica	Great Blue Lobelia	√	√	√	√
Lolium perenne	Perennial Ryegrass	√	√		
Lonicera canadensis	American Fly-honeysuckle	√	√		√
Lonicera caprifolium	Italian Woodbine		√		
Lonicera dioica	Mountain Honeysuckle	√	√	√	√
Lonicera hirsuta	**Hairy Honeysuckle**	√	√	√	√
Lonicera japonica	Japanese Honeysuckle	√	√		
Lonicera maackii	Amur Honeysuckle	√			
Lonicera morrowii	Morrow Honeysuckle	√	√		

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Lonicera oblongifolia	**Swamp Fly-honeysuckle**	√		√	√
Lonicera tatarica	Tartarian Honeysuckle	√	√	√	√
Lonicera villosa	**Mountain Fly-honeysuckle**	√			
Lonicera x bella	Bella Honeysuckle	√	√		√
Lonicera xylosteum	European Fly-honey-suckle	√	√		
Lotus corniculatus	Birds-foot Trefoil	√	√	√	√
Ludwigia palustris	**Marsh Seedbox**	√	√		√
Lunaria annua	Annual Honesty	√			
Lupinus perennis ssp. perennis	**Sundial Lupine**	√			
Luzula acuminata	Hairy Woodrush	√	√		
Luzula multiflora ssp. multiflora	**Common Woodrush**	√			
Lychnis coronaria	Rose Campion	√			
Lycium barbarum	Common Matrimony Vine	√			
Lycopodium annotinum	**Stiff Clubmoss**	√	√		√
Lycopodium clavatum	**Running Clubmoss**	√			√
Lycopodium dendroideum	Treelike Clubmoss	√	√	√	√
Lycopodium hickeyi	Hickey's Clubmoss	√			
Lycopodium obscurum	**Tree Clubmoss**	√	√	√	√
Lycopus americanus	American Bugleweed	√	√	√	√
Lycopus europaeus	European Bugleweed	√	√		
Lycopus uniflorus	Northern Bugleweed	√	√	√	√
Lysimachia ciliata	Fringed Loosestrife	√	√	√	√
Lysimachia nummularia	Creeping Jennie	√	√	√	√
Lysimachia punctata	Spotted Loosestrife	√			
Lysimachia quadrifolia	**Whorled Loosestrife**	√			
Lysimachia terrestris	**Swamp Loosestrife**	√			
Lysimachia thyrsiflora	Water Loosestrife	√	√	√	√
Lysimachia vulgaris	Garden Loosestrife	√			
Lythrum salicaria	Purple Loosestrife	√	√	√	√
Maclura pomifera	Osageorange	√			
Maianthemum canadense	Canada Mayflower	√	√	√	√
Maianthemum racemosum ssp. racemosum	False Solomon's-seal	√	√	√	√
Maianthemum stellatum	Starry False Solomon's-seal	√	√		√
Maianthemum trifolium	Three-leaf Solomon's-seal	√	√		√
Malaxis monophyllos ssp. brachypoda	**White Adder's-mouth**	√	√		√
Malaxis unifolia	Green Adder's-mouth		√		
Malus baccata	Siberian Crabapple	√	√		
Malus pumila	Common Apple	√	√	√	√
Malva alcea	Vervain Mallow	√	√		
Malva moschata	Musk Mallow	√	√		√
Malva neglecta	Dwarf Mallow	√	√		√
Malva rotundifolia	Low Mallow	√			
Malva sylvestris	High Mallow		√		
Malva sylvestris	High Mallow	√			
Marsilea quadrifolia	European Water Fern	√			
Matricaria discoidea	Pineapple-weed Chamomile	√	√		
Matricaria recutita	German Mayweed	√			

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Matteuccia struthiopteris var. pensylvanica	Ostrich Fern	√	√	√	√
Medeola virginiana	Indian Cucumber-root	√	√	√	√
Medicago lupulina	Black Medic	√	√	√	√
Medicago sativa ssp. sativa	Alfalfa	√	√	√	√
Medicago sativa ssp. falcata	Yellow Alfalfa	√			
Melampyrum lineare	**American Cow-wheat**	√			
Melica smithii	**Smith Melic Grass**	√			
Melilotus albus	White Sweet Clover	√	√	√	√
Melilotus officinalis	Yellow Sweet Clover	√	√		
Melissa officinalis	Garden Balm	√			
Menispermum canadense	Canada Moonseed	√	√		√
Mentha arvensis ssp. borealis	Wild Mint subspecies	√	√	√	√
Mentha spicata	Spearmint	√	√	√	√
Mentha x gentilis	Red Mint	√			
Mentha x piperita	Peppermint	√	√	√	√
Menyanthes trifoliata	**Bog Buckbean**	√	√		√
Metasequoia glypostroboides	Dawn Redwood	√			
Milium effusum	**American Milletgrass**	√			√
Mimulus ringens	Square-stem Monkey-flower	√	√	√	√
Mirabilis nyctaginea	Wild Four-o'clock	√			
Miscanthus sacchariflorus	Amur Silver Grass	√	√		
Miscanthus sinensis	Chinese Silver Grass	√	√		
Mitchella repens	Partridge-berry	√	√	√	√
Mitella diphylla	Two-leaf Miterwort	√	√	√	√
Mitella nuda	Naked Miterwort	√	√	√	√
Monarda didyma	**Bee-balm**	√	√		
Monarda fistulosa	Wild Bergamot Bee-balm	√	√		√
Moneses uniflora	**One-flower Wintergreen**	√		√	√
Monotropa hypopithys	**American Pinesap**	√	√	√	√
Monotropa uniflora	Indian-pipe	√	√	√	√
Morus alba	White Mulberry	√	√		
Muhlenbergia frondosa	**Wirestem Muhly**	√			
Muhlenbergia glomerata	**Marsh Muhly**	√			
Muhlenbergia mexicana var. mexicana	Mexican Muhly	√	√	√	√
Muhlenbergia mexicana var. filiformis	Slender Muhly Grass	√			
Muhlenbergia sylvatica (no variety recorded)	Muhly				√
Muhlenbergia sylvatica var. sylvatica	**Woodland Muhly**	√			
Muscari botryoides	Common Grape-hyacinth	√			
Mycelis muralis	Wall Lettuce				√
Myosotis arvensis	Rough Forget-me-not	√			
Myosotis laxa	Small Forget-me-not	√	√	√	√
Myosotis scorpioides	True Forget-me-not	√	√	√	√
Myosotis stricta	Small-flowered Forget-me-not	√	√		
Myosotis sylvatica	Woodland Forget-me-not	√	√		
Myriophyllum heterophyllum	Broadleaf Water-milfoil	√			
Myriophyllum sibiricum	**Common Water-milfoil**	√	√	√	

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Myriophyllum spicatum	Eurasian Water-milfoil	√			
Myriophyllum verticillatum	**Whorled Water-milfoil**	√			
Najas flexilis	**Slender Naiad**	√			
Narcissus poeticus	Poets' Narcissus	√			
Narcissus pseudonarcissus	Commom Daffodil	√			
Nasturtium microphyllum	One-row Water-cress	√	√	√	√
Nasturtium officinale	True Watercress	√	√	√	√
Nemopanthus mucronatus	**Mountain Holly**	√	√		√
Neobeckia aquatica	Lake-cress	√			
Nepeta cataria	Catnip	√	√	√	√
Neslia paniculata	Common Ball-mustard	√			
Nicandra physalodes	Apple-of-peru	√			
Nicotiana longiflora	Long-flower Tobacco	√			
Nigella damascena	Love-in-a-mist	√			
Nymphaea odorata (no ssp. recorded)	American Water-lily	√	√	√	
Nymphaea odorata ssp. odorata	White Water-lily	√			√
Nymphaea odorata ssp. tuberosa	Tuberous White Water-lily	√	√		
Nymphoides peltata	Yellow Floating-heart	√			
Oclemena nemoralis	**Bog Aster**	√		√	
Oenothera biennis	Common Evening-primrose	√	√	√	√
Oenothera clelandii	**Cleland's Evening-primrose**	√			
Oenothera parviflora	Northern Evening-primrose	√	√		
Oenothera perennis	**Small Sundrops**	√			
Oenothera pilosella ssp. pilosella	Meadow Sundrops	√	√		
Onoclea sensibilis	Sensitive Fern	√	√	√	√
Onopordum acanthium	Scotch Cotton-thistle	√	√		
Onosmodium molle ssp. hispidissimum	**Soft-hair Marbleseed**	√			
Ophioglossum pusillum	**Northern Adder's Tongue**	√			
Origanum vulgare	Wild Marjoram	√			√
Ornithogalum umbellatum	Common Star-of-bethlehem	√			
Orobanche uniflora	**One-flowered Broomrape**	√			
Orthilia secunda	**One-side Wintergreen**	√	√	√	√
Oryzopsis asperifolia	White-grained Mountain-ricegrass	√	√		√
Oryzopsis racemosa	**Black-fruit Mountain-ricegrass**	√	√		
Osmorhiza claytonii	Hairy Sweet-cicely	√	√	√	√
Osmorhiza longistylis	**Smoother Sweet-cicely**	√	√		
Osmunda cinnamomea	Cinnamon Fern	√	√	√	√
Osmunda claytoniana	**Interrupted Fern**	√	√		√
Osmunda regalis var. spectabilis	Royal Fern	√	√	√	√
Ostrya virginiana	Eastern Hop-hornbeam	√	√	√	√
Oxalis acetosella ssp. montana	**Mountain Woodsorrel**	√		√	√
Oxalis corniculata	Creeping Woodsorrel	√	√		
Oxalis dillenii	Dillen's Woodsorrel	√	√	√	
Oxalis stricta	Upright Yellow Woodsorrel	√	√	√	√
Pachysandra terminalis	Japanese-spurge	√			

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Packera aurea	**Golden Ragwort**	√		√	√
Panax quinquefolius	**American Ginseng**	√	√		√
Panax trifolius	**Dwarf Ginseng**	√			
Panicum acuminatum var. acuminatum	Tapered Rosette Grass	√	√	√	√
Panicum capillare	Old Witch Panic Grass	√	√	√	√
Panicum dichotomiflorum	Fall Panic Grass	√			
Panicum latifolium	**Broad-leaf Witch Grass**	√			
Panicum linearifolium	**Slim-leaf Witch Grass**	√	√		
Panicum miliaceum	Proso Millet				√
Panicum miliaceum	Proso Millet	√	√		
Panicum villosissimum	White-hair Witch Grass	√			
Papaver dubium	Long-pod Poppy	√			
Papaver orientale	Oriental Poppy	√			
Papaver somniferum	Opium Poppy	√			
Parietaria pensylvanica	**Pennsylvania Pellitory**	√			
Parnassia glauca	**Carolina Grass-of-parnassus**	√			
Parnassia parviflora	**Small-flower Grass-of-parnassus**	√			
Parthenocissus inserta	Thicket Creeper	√	√	√	√
Parthenocissus quinquefolia	Virginia Creeper	√	√	√	√
Parthenocissus tricuspidata	Boston Ivy	√			
Paspalum setaceum	Slender Paspalum	√			
Pastinaca sativa	Wild Parsnip	√	√		√
Pedicularis canadensis	**Early Wood Lousewort**	√			
Pellaea glabella ssp. glabella	**Smooth Cliffbrake**	√			
Pennisetum glauca	Yellow Foxtail	√	√		
Penstemon digitalis	**Foxglove Beardtongue**	√	√	√	
Penstemon hirsutus	**Hairy Beardtongue**	√	√		√
Penthorum sedoides	Ditch-stonecrop	√	√		√
Petasites frigidus	**Sweet Coltsfoot**	√			
Petunia x hybrida	Garden Petunia		√		
Phalaris arundinacea	Reed Canary Grass	√	√	√	√
Phalaris canariensis	Common Canary Grass	√			
Phegopteris connectilis	**Northern Beech Fern**	√	√	√	√
Phellodendron amurense	Amur Corktree	√			
Philadelphus coronarius	Sweet Mock-orange	√	√		
Philadelphus inodorus	Mock Orange	√			
Phleum pratense	Meadow Timothy	√	√	√	√
Phlox divaricata	**Wild Blue Phlox**	√			√
Phlox paniculata	Fall Phlox	√	√		
Phlox subulata	Moss Phlox	√			
Phragmites australis (no ssp. recorded)	Common Reed	√	√	√	√
Phragmites australis ssp. australis	Common Reed	√		√	
Phryma leptostachya	Lopseed	√	√	√	√
Physalis alkekengi	Strawberry Ground-cherry	√			
Physalis heterophylla	**Clammy Ground-cherry**	√	√		√
Physalis virginiana	**Virginia Ground-cherry**	√			√
Physocarpus opulifolius	**Eastern Ninebark**	√	√		√

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Physostegia virginiana ssp. virginiana*	False Dragon-head subspecies	√			√
Picea abies	Norway Spruce	√	√	√	√
Picea glauca	White Spruce	√	√	√	√
Picea mariana	**Black Spruce**	√	√		√
Picea pungens	Blue Spruce	√	√	√	√
Picris hieracioides ssp. hieracioides	Hawkweed Oxtongue	√			√
Pilea fontana	**Springs Clearweed**	√	√	√	√
Pilea pumila	Canada Clearweed	√	√		√
Pinus banksiana	Jack Pine	√	√	√	
Pinus mugo	Mugo Pine	√			
Pinus nigra	Black Pine	√	√		
Pinus resinosa	**Red Pine**	√	√	√	√
Pinus strobus	Eastern White Pine	√	√	√	√
Pinus sylvestris	Scotch Pine	√	√	√	√
Plantago arenaria	Sand Plantain	√			
Plantago lanceolata	English Plantain	√	√	√	√
Plantago major	Common Plantain	√	√	√	√
Plantago media	Hoary Plantain	√			
Plantago rugelii	Black-seed Plantain	√	√		√
Platanthera clavellata	**Small Green Woodland Orchid**	√			
Platanthera flava var. herbiola	**Pale Green Orchid**	√			
Platanthera hyperborea var. hyperborea	Northern Green Orchid	√	√	√	√
Platanthera lacera	**Green-fringed Orchid**	√			
Platanthera obtusata	**Small Northern Bog-orchid**	√	√		√
Platanthera psycodes	**Small Purple-fringed Orchid**	√			
Platanus hybrida	London Plane-tree	√			
Platanus occidentalis	**Sycamore**	√			
Poa alsodes	**Grove Meadow Grass**	√	√		
Poa annua	Annual Bluegrass	√	√		√
Poa bulbosa	Bulbous Bluegrass	√			
Poa compressa	Canada Bluegrass	√	√	√	√
Poa nemoralis	Woods Bluegrass	√	√	√	√
Poa palustris	Fowl Bluegrass	√	√	√	√
Poa pratensis ssp. pratensis	Kentucky Bluegrass	√	√	√	√
Poa saltuensis	**Oldpasture Bluegrass**	√			
Poa trivialis	Rough Bluegrass	√	√		
Podophyllum peltatum	May Apple	√	√		√
Pogonia ophioglossoides	**Rose Pogonia**	√			√
Polanisia dodecandra	**Common Clammy-weed**	√			
Polygala paucifolia	Gay-wing Milkwort	√	√	√	√
Polygala sanguinea	**Field Milkwort**	√			
Polygala senega	**Seneca Snakeroot**	√			
Polygala verticillata	**Whorled Milkwort**	√			
Polygonatum biflorum	Giant Solomon's-seal	√	√		
Polygonatum pubescens	Downy Solomon's-seal	√	√	√	√
Polygonum achoreum	Leathery Knotweed	√			
Polygonum amphibium	Water Smartweed	√	√	√	√

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Polygonum arenastrum	Oval-leaf Knotweed		√		
Polygonum aviculare	Prostrate Knotweed	√	√		
Polygonum cilinode	**Fringed Black Bindweed**	√		√	
Polygonum convolvulus	Black Bindweed	√	√	√	√
Polygonum cuspidatum	Japanese Knotweed	√	√		
Polygonum douglasii	**Douglas Knotweed**	√			
Polygonum hydropiper	Marshpepper Smartweed	√	√	√	√
Polygonum hydropiperoides	**Mild Water-pepper**	√	√		
Polygonum lapathifolium var. lapathifolium	Hedge Cornbind	√	√		√
Polygonum orientale	Kiss-me-over-the-garden-gate	√			
Polygonum pensylvanicum	**Pennsylvania Smartweed**	√	√		√
Polygonum persicaria	Lady's Thumb	√	√	√	√
Polygonum punctatum	**Dotted Smartweed**	√			
Polygonum sagittatum	**Arrow-leaved Tearthumb**	√			
Polygonum scandens	**Climbing False-buckwheat**	√			
Polygonum virginianum	**Jumpseed**	√	√		
Polypodium virginianum	**Rock Polypody**	√	√		
Polystichum acrostichoides	Christmas Fern	√	√		√
Polystichum lonchitis	Northern Holly-fern	√	√		
Pontederia cordata	Pickerel Weed	√	√		
Populus alba	White Poplar	√	√		
Populus balsamifera ssp. balsamifera	Balsam Poplar	√	√	√	√
Populus deltoides (no ssp. recorded)	Eastern Cottonwood	√	√		
Populus deltoides ssp. deltoides	Eastern Cottonwood subspecies	√	√		√
Populus grandidentata	Large-tooth Aspen	√	√	√	√
Populus nigra	Black Cottonwood	√			
Populus tremuloides	Trembling Aspen	√	√	√	√
Populus x berolinensis	Berlin Poplar	√			
Populus x canadensis	Carolina Poplar	√	√		
Populus x canescens	Gray Poplar	√			
Populus x heimburgeri	Heimburger's Poplar	√			
Populus x jackii	Jack's Poplar	√	√		√
Populus x rouleauiana	Rouleau's Poplar	√			
Portulaca oleracea	Common Purslane	√	√		
Potamogeton amplifolius	**Large-leaf Pondweed**	√	√		
Potamogeton berchtoldii	**Small Pondweed**	√	√		
Potamogeton crispus	Curly Pondweed	√	√	√	√
Potamogeton epihydrus	**Ribbon-leaf Pondweed**	√			
Potamogeton foliosus	**Leafy Pondweed**	√	√		√
Potamogeton gramineus	**Grassy Pondweed**	√	√		
Potamogeton illinoensis	**Illinois Pondweed**	√			
Potamogeton natans	Floating Pondweed	√	√	√	√
Potamogeton nodosus	**Longleaf Pondweed**	√			
Potamogeton pectinatus	Sago Pondweed	√	√	√	√
Potamogeton praelongus	**White-stem Pondweed**	√			
Potamogeton pusillus var. pusillus	**Slender Pondweed**	√			√

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Potamogeton richardsonii	**Redhead Pondweed**	√			
Potamogeton spirillus	**Spiral Pondweed**	√			
Potamogeton zosteriformis	**Flatstem Pondweed**	√	√		√
Potentilla anserina	Silverweed	√	√	√	
Potentilla argentea	Silvery Cinquefoil	√			
Potentilla arguta	Tall Cinquefoil	√			
Potentilla fruticosa	**Shrubby Cinquefoil**	√	√		
Potentilla inclinata	Ashy Cinquefoil		√		
Potentilla norvegica ssp. norvegica	Norwegian Cinquefoil	√	√	√	√
Potentilla palustris	Marsh Cinquefoil	√	√	√	√
Potentilla paradoxa	**Bushy Cinquefoil**	√			
Potentilla recta	Sulphur Cinquefoil	√	√	√	√
Potentilla simplex	Old-field Cinquefoil	√	√		
Prenanthes alba	White Rattlesnake-root	√	√	√	√
Prenanthes altissima	Tall Rattlesnake-root	√	√		√
Prunella vulgaris (no ssp. recorded)	Self-heal	√	√	√	√
Prunella vulgaris ssp. lanceolata	Lance Self-heal	√	√	√	√
Prunella vulgaris ssp. vulgaris	Self-heal subspecies	√	√		√
Prunus avium	Sweet Cherry	√	√		
Prunus cerasifera	Cherry Plum	√			
Prunus cerasus	Sour Red Cherry	√			
Prunus domestica var. domestica	Common Plum	√			
Prunus mahaleb	Perfumed Cherry	√			
Prunus nigra	Canada Plum	√	√		
Prunus pensylvanica	Pin Cherry	√	√	√	√
Prunus serotina	Wild Black Cherry	√	√	√	√
Prunus tomentosa	Nanking Cherry	√			
Prunus virginiana ssp. virginiana	Chokecherry	√	√	√	√
Prunus x cistena	Purple Sand Cherry	√			
Pseudotsuga menziesii	Douglas Fir		√		
Pteridium aquilinum var. latiusculum	Bracken	√	√	√	√
Puccinellia distans	Spreading Alkali Grass	√			
Pyrola americana	American Wintergreen	√			
Pyrola asarifolia	Pink Wintergreen	√	√	√	√
Pyrola chlorantha	**Greenish-flowered Wintergreen**	√			√
Pyrola elliptica	Shinleaf	√	√	√	√
Pyrus communis	Common Pear	√	√	√	
Quercus alba	White Oak	√	√	√	
Quercus bicolor	**Swamp White Oak**	√			
Quercus ellipsoidalis	Northern Pin Oak	√			
Quercus macrocarpa	Bur Oak	√	√	√	√
Quercus muehlenbergii	Yellow Oak		√		
Quercus palustris	Pin Oak	√			
Quercus robur	English Oak		√		
Quercus rubra	Northern Red Oak	√	√	√	√
Quercus velutina	**Black Oak**	√	√		

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Ranunculus abortivus	Kidney-leaved Buttercup	√	√	√	√
Ranunculus acris	Tall Buttercup	√	√	√	√
Ranunculus aquatilis var. diffusus	**White Water Buttercup**	√		√	
Ranunculus fascicularis	Early Buttercup	√			
Ranunculus flabellaris	**Yellow Water-crowfoot**	√	√		√
Ranunculus hispidus var. caricetorum	Swamp Buttercup	√	√	√	√
Ranunculus hispidus var. hispidus	**Bristly Buttercup**	√	√		
Ranunculus longirostris	Eastern White Water-crowfoot	√			
Ranunculus pensylvanicus	**Bristly Crowfoot**	√	√	√	√
Ranunculus recurvatus var. recurvatus	Hooked Crowfoot variety	√	√	√	√
Ranunculus repens	Creeping Buttercup	√	√	√	√
Ranunculus sceleratus (no var. recorded)	Cursed Crowfoot	√	√		√
Ranunculus sceleratus var. sceleratus	Cursed Crowfoot variety	√	√		
Ratibida columnifera	Upright Prairie Coneflower	√			
Rhamnus alnifolia	Alderleaf Buckthorn	√	√	√	√
Rhamnus cathartica	Common Buckthorn	√	√	√	√
Rhamnus frangula	Glossy Buckthorn	√	√	√	√
Rheum rhabarbarum	Rubarb	√	√		
Rhodotypos scandens	Jetbead	√			
Rhus aromatica	Fragrant Sumac	√	√		
Rhus glabra	**Smooth Sumac**	√	√		
Rhus hirta	Staghorn Sumac	√	√	√	√
Rhus radicans ssp. negundo	Poison Ivy subspecies	√	√	√	√
Rhus radicans ssp. rydbergii	Poison Ivy (shrub form)	√	√	√	√
Rhynchospora alba	**White Beakrush**	√			√
Ribes americanum	Wild Black Currant	√	√	√	√
Ribes cynosbati	Prickly Gooseberry	√	√	√	√
Ribes glandulosum	**Skunk Currant**	√	√	√	√
Ribes hirtellum	**Smooth Gooseberry**	√	√	√	√
Ribes hudsonianum	**Northern Black Currant**	√	√	√	√
Ribes lacustre	Bristly Black Currant	√			
Ribes nigrum	European Black Currant	√	√		√
Ribes odoratum	Buffalo Currant	√		√	
Ribes rubrum	Northern Red Currant	√	√	√	√
Ribes triste	Swamp Red Currant	√	√	√	√
Ribes uva-crispa	European Gooseberry	√	√		
Robinia pseudo-acacia	Black Locust	√	√	√	√
Robinia viscosa	Clammy Locust	√			
Rorippa palustris ssp. fernaldiana	Marsh Yellow-cress	√			
Rorippa palustris ssp. hispida	Bog Yellow-cress subspecies	√	√		
Rorippa palustris ssp. palustris	Bog Yellow-cress subspecies	√			
Rorippa sylvestris	Creeping Yellow-cress	√	√		
Rosa acicularis ssp. sayi	Prickly Rose	√	√		
Rosa blanda	Smooth Rose	√	√		√
Rosa canina	Dog Rose	√	√		√

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Rosa multiflora	Multiflora Rose	√	√		√
Rosa palustris	**Swamp Rose**	√	√		√
Rosa rubiginosa	Sweetbriar Rose	√	√		
Rubus allegheniensis	Allegheny Blackberry	√	√	√	√
Rubus flagellaris	**Northern Dewberry**	√			
Rubus hispidus	**Bristley Dewberry**	√			
Rubus idaeus ssp. idaeus	Common Red Raspberry subspecies	√	√	√	√
Rubus idaeus ssp. strigosus	Grayleaf Red Raspberry	√	√	√	√
Rubus occidentalis	Black Raspberry	√	√	√	√
Rubus odoratus	Purple Flowering Raspberry	√	√	√	√
Rubus pubescens	Dwarf Red Raspberry	√	√	√	√
Rubus setosus	Small Bristleberry		√		
Rudbeckia hirta	Black-eyed Susan	√	√	√	√
Rudbeckia laciniata	Cut-leaved Coneflower	√			
Rudbeckia triloba	Brown-eyed Susan	√	√		
Rumex acetosa	Garden Sorrel		√		
Rumex acetosella ssp. acetosella	Garden Sorrel subspecies	√	√		
Rumex crispus	Curly Dock	√	√	√	√
Rumex longifolius	Door-yard Dock	√			
Rumex obtusifolius	Bitter Dock	√	√	√	√
Rumex orbiculatus	Water Dock	√	√	√	√
Rumex triangulivalvis	Triangular-valve Dock	√			
Sagina procumbens	Procumbent Pearlwort	√			
Sagittaria cuneata	**Arum-leaved Arrowhead**	√			√
Sagittaria graminea var. graminea	**Grassleaf Arrowhead**	√		√	
Sagittaria latifolia	Broadleaf Arrowhead	√	√	√	√
Sagittaria rigida	**Sessile-fruited Arrowhead**	√		√	
Salix alba (no var. recorded)	White Willow	√	√	√	√
Salix alba var. vitellina	Golden Willow	√	√		
Salix amygdaloides	Peach-leaved Willow	√	√	√	√
Salix bebbiana	Bebb's Willow	√	√	√	√
Salix candida	**Hoary Willow**	√			
Salix caprea	Goat Willow	√			
Salix cinerea	European Gray Willow	√			
Salix discolor	Pussy Willow	√	√	√	√
Salix eriocephala	Heart-leaved Willow	√	√	√	√
Salix exigua	Sandbar Willow	√	√	√	√
Salix fragilis	Crack Willow	√	√	√	√
Salix lucida	Shining Willow	√	√	√	√
Salix nigra	**Black Willow**	√	√	√	
Salix pedicellaris	**Bog Willow**	√			√
Salix pentandra	Laurel Willow	√			
Salix petiolaris	Meadow Willow	√	√	√	√
Salix purpurea	Purpleosier Willow	√	√	√	√
Salix serissima	**Autumn Willow**	√	√	√	√
Salix viminalis	Basket Willow	√			
Salix x pendulina	Weeping willow	√	√		
Salix x rubens	Hybrid Crack Willow	√	√		√

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Salsola kali	Russian Thistle	√	√		
Sambucus canadensis	Common Elderberry	√	√	√	√
Sambucus racemosa ssp. pubens	Red Elderberry	√	√	√	√
Sambucus racemosa ssp. racemosa	European Red Elderberry	√			√
Sanguinaria canadensis	Bloodroot	√	√	√	√
Sanicula marilandica	Black Snake-root	√	√		√
Sanicula odorata	**Cluster Sanicle**	√			
Sanicula trifoliata	Large-fruited Sanicle	√	√		
Saponaria officinalis	Bouncing-bet	√	√		
Sarracenia purpurea	**Northern Pitcher-plant**	√	√		√
Sassafras albidum	**Sassafras**	√			
Satureja hortensis	Summer Savory	√			
Saxifraga virginiensis	**Virginia Saxifrage**	√			
Scheuchzeria palustris	**Pod Grass**	√			√
Schizachne purpurascens ssp. purpurascens	False Melic Grass	√	√	√	√
Schizachyrium scoparium	**Little Bluestem**	√	√		
Schoenoplectus acutus	**Hard-stem Bulrush**	√		√	
Schoenoplectus pungens	**Three-square**	√	√		
Schoenoplectus tabernaemontani	Soft-stem Bulrush	√	√	√	√
Scilla siberica	Siberian Squill	√			
Scirpus atrovirens	Dark-green Bulrush	√	√	√	√
Scirpus cyperinus	Cottongrass Bulrush	√	√	√	√
Scirpus microcarpus	Red-tinge Bulrush	√	√	√	√
Scirpus pendulus	Rufous Bulrush	√	√		√
Scleranthus annuus	Annual Knawel	√			
Scrophularia lanceolata	**Lance-leaf Figwort**	√			
Scrophularia marilandica	**Carpenter's Square Figwort**	√	√		
Scutellaria galericulata	Hooded Skullcap	√	√	√	√
Scutellaria lateriflora	Mad Dog Skullcap	√	√	√	√
Scutellaria parvula var. parvula	**Small Skullcap**	√			√
Secale cereale	Cultivated Rye	√			
Sedum acre	Gold-moss Stonecrop	√	√		
Sedum sarmentosum	Stringy Stonecrop	√			
Sedum spurium	Two-row Stonecrop	√			
Sedum telephium ssp. fabaria	Witch's Moneybags	√			
Selaginella eclipes	**Hidden Spike-moss**	√			√
Senecio pauperculus	Balsam Ragweed	√			
Senecio viscosus	Sticky Groundsel	√			
Senecio vulgaris	Old-man-in-the-spring	√	√		
Setaria faberi	Giant Foxtail	√			
Setaria italica	Italian Foxtail	√			
Setaria pumila	White Foxtail	√	√		
Setaria verticillata var. verticillata	Hooked Bristle Grass	√			
Setaria viridis	Green Bristle Grass	√	√	√	
Shepherdia canadensis	**Canada Buffalo-berry**	√			

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Sicyos angulatus	**One-seed Bur-cucumber**	√	√		
Silene antirrhina	**Sleepy Catchfly**	√			
Silene dichotoma	Forked Catchfly	√			
Silene latifolia	White Campion	√		√	√
Silene noctiflora	Night-flowering Catchfly	√	√		
Silene vulgaris	Bladder Campion	√	√	√	√
Silphium laciniatum var. laciniatum	Compass Plant	√			
Silphium perfoliatum var. perfoliatum	Cup-plant variety	√	√		
Sinapis arvensis	Corn Mustard	√	√		
Sisymbrium altissimum	Tall Hedgemustard	√	√		
Sisymbrium officinale	Hairy-pod Hedgemustard	√			
Sisyrinchium montanum	Strict Blue-eyed-grass	√	√		√
Sium suave	Hemlock Water-parsnip	√	√	√	√
Smilax herbacea	Smooth Herbaceous Greenbrier	√	√	√	√
Smilax hispida	Hispid Greenbrier	√	√	√	√
Solanum dulcamara	Climbing Nightshade	√	√	√	√
Solanum nigrum	Black Nightshade	√	√		√
Solanum ptychanthum	Black Nightshade		√		
Solanum ptychanthum	Black Nightshade	√			
Solanum rostratum	Buffalo Bur	√			
Solidago altissima var. altissima	Late Goldenrod	√	√	√	√
Solidago arguta var. arguta	Cut-leaved Golden-rod	√			
Solidago bicolor	**White Goldenrod**	√			
Solidago caesia	Bluestem Goldenrod	√	√	√	√
Solidago canadensis var. canadensis	Canada Goldenrod variety	√	√	√	√
Solidago flexicaulis	Zig-zag Goldenrod	√	√		√
Solidago gigantea	Smooth Goldenrod	√	√	√	√
Solidago hispida (no var. recorded)	Hairy Goldenrod	√	√		
Solidago hispida var. hispida	**Hairy Goldenrod variety**	√	√		
Solidago juncea	Early Goldenrod	√	√	√	√
Solidago nemoralis ssp. nemoralis	Gray Goldenrod	√	√	√	√
Solidago patula	**Roundleaf Goldenrod**	√	√	√	
Solidago rigida ssp. rigida	Stiff Goldenrod	√			
Solidago rugosa ssp. rugosa	Wrinkleleaf Goldenrod	√	√	√	√
Solidago squarrosa	**Stout Goldenrod**	√	√		
Solidago uliginosa	**Bog Goldenrod**	√	√	√	√
Sonchus arvensis ssp. arvensis	Perennial Sowthistle	√	√	√	√
Sonchus asper ssp. asper	Spiny Sowthistle	√	√	√	
Sonchus oleraceus	Common Sowthistle	√	√		√
Sorbaria sorbifolia	False Spiraea	√			
Sorbus americana	**American Mountain-ash**	√			√
Sorbus aucuparia	European Mountain-ash	√	√	√	√
Sorbus decora	Northern Mountain-ash	√	√		√
Sorghastrum nutans	**Yellow Indian-grass**	√			
Sparganium emersum	Greenfruit Bur-reed	√	√	√	√

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Sparganium eurycarpum	Large Bur-reed	√	√	√	√
Sparganium natans	Small Bur-reed	√			√
Spartina pectinata	**Prairie Cordgrass**	√			
Spergularia media	Middle-size Sandspurry	√			
Sphenopholis intermedia	Slender Wedge Grass	√	√	√	√
Spiraea alba	Narrow-leaved Meadow-sweet	√	√	√	√
Spiraea japonica	Japanese Spiraea	√			
Spiraea tomentosa	**Hardhack Spiraea**	√			
Spiranthes cernua	**Nodding Ladies'-tresses**	√	√	√	
Spiranthes lucida	Shining Ladies'-tresses	√			
Spiranthes romanzoffiana	Hooded Ladies'-tresses	√			√
Spirodela polyrrhiza	Greater Duckweed	√	√	√	√
Sporobolus cryptandrus	**Sand Dropseed**	√			
Sporobolus neglectus	Small Dropseed	√			
Sporobolus vaginiflorus	Sheathed Dropseed	√			
Stachys byzantina	Woolly Hedge-nettle				√
Stachys hispida	**Hispid Hedge-nettle**	√	√		
Stachys palustris	**Marsh Hedge-nettle**	√		√	
Staphylea trifolia	**American Bladdernut**	√			
Stellaria graminea	Little Starwort	√	√	√	√
Stellaria longifolia	**Longleaf Starwort**	√	√		
Stellaria media	Common Chickweed	√		√	
Streptopus lanceolatus	Rose Twisted-stalk	√	√	√	√
Symphoricarpos albus (no var. recorded)	Snowberry	√	√		√
Symphoricarpos albus var. laevigatus	Western Snowberry	√	√		
Symphoricarpos occidentalis	Wolfberry	√			
Symphyotrichum ciliolatum	Lindley's Aster	√			
Symphyotrichum boreale	Rush Aster	√	√		
Symphyotrichum ciliatum	Alkali Aster	√	√		
Symphyotrichum cordifolium	Heart-leaf Aster	√	√		√
Symphyotrichum ericoides var. ericoides	White Heath Aster	√	√	√	√
Symphyotrichum lanceolatum ssp. lanceolatum	Panicled Aster subspecies	√	√	√	√
Symphyotrichum lateriflorum var. lateriflorum	Small White Aster	√	√	√	√
Symphyotrichum novae-angliae	New England Aster	√	√	√	√
Symphyotrichum oolentangiense	**Sky-blue Aster**	√	√		
Symphyotrichum pilosum var. pilosum	**White Heath Aster variety**	√	√		√
Symphyotrichum puniceum	Swamp Aster	√	√	√	√
Symphyotrichum urophyllum	**Arrow-leaved Aster**	√	√		√
Symphyotrichum x amethystinum	Hybrid Aster	√			
Symphytum asperum	Prickly Comfrey	√			
Symphytum officinale	Common Comfrey	√			
Symplocarpus foetidus	**Skunk Cabbage**	√	√	√	
Syringa vulgaris	Common Lilac	√	√	√	√
Taenidia integerrima	**Yellow Pimpernel**	√			

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Tanacetum parthenium	Feverfew	√	√		
Tanacetum vulgare	Common Tansy	√	√		
Taraxacum erythrospermum	Red-seed Dandelion	√			√
Taraxacum officinale	Brown-seed Dandelion	√	√	√	√
Taxus canadensis	Canadian Yew	√	√	√	√
Teucrium canadense ssp. canadense	**Canada Germander**	√	√		
Thalictrum dioicum	Early Meadow-rue	√	√	√	√
Thalictrum pubescens	Tall Meadow-rue	√	√	√	√
Thalictrum thalictroides	**Windflower**	√			
Thelypteris noveboracensis	**New York Fern**	√	√		√
Thelypteris palustris var. pubescens	Marsh Fern	√	√	√	√
Thlaspi arvense	Field Penny-cress	√	√		
Thuja occidentalis	Eastern White Cedar	√	√	√	√
Thymus praecox ssp. arcticus	Creeping Thyme	√	√		
Tiarella cordifolia	Heart-leaved Foam-flower	√	√	√	√
Tilia americana	American Basswood	√	√	√	√
Tilia cordata	Little-leaf Linden	√	√	√	√
Torilis japonica	Erect Hedge-parsley	√	√		
Torreyochloa pallida var. fernaldii	Fernald's Manna Grass	√			
Tragopogon dubius	Meadow Goat's-beard	√	√	√	√
Tragopogon porrifolius	Purple Goat's-beard	√			
Tragopogon pratensis ssp. pratensis	Jack go to bed at noon	√	√	√	
Triadenum fraseri	Marsh St. John's-wort	√			√
Trientalis borealis ssp. borealis	Starflower	√	√	√	√
Trifolium arvense	Rabbit-foot Clover	√	√		
Trifolium aureum	Yellow Clover	√		√	
Trifolium campestre	Low Hop Clover	√	√	√	
Trifolium dubium	Suckling Clover	√			
Trifolium hybridum (no ssp. recorded)	Alsike Clover	√	√		
Trifolium hybridum ssp. elegans	Alsike Clover subspecies	√			√
Trifolium incarnatum	Crimson Clover	√			
Trifolium pratense	Red Clover	√	√	√	√
Trifolium repens	White Clover	√	√	√	√
Triglochin palustre	**Marsh Bog Arrow-grass**	√			√
Trillium cernuum	**Nodding Trillium**	√			
Trillium erectum	Red Trillium	√	√	√	√
Trillium grandiflorum	White Trillium	√	√	√	√
Trillium undulatum	**Painted Trillium**	√			
Triosteum aurantiacum	**Coffee Tinker's-weed**	√	√		√
Tripleurospermum perforata	Scentless Mayweed	√	√		
Triticum aestivum	Cultivated Wheat	√	√		
Tsuga canadensis	Eastern Hemlock	√	√	√	√
Tulipa sylvestris	Wild Tulip	√			
Tussilago farfara	Colt's Foot	√	√	√	√
Typha angustifolia	Narrow-leaved Cattail	√	√	√	√
Typha latifolia	Broad-leaf Cattail	√	√	√	√

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Typha x glauca	White Cattail	√	√	√	√
Ulmus americana	American Elm	√	√	√	√
Ulmus glabra	Wych Elm	√			
Ulmus pumila	Siberian Elm	√	√		
Ulmus rubra	Slippery Elm	√	√		√
Ulmus thomasii	**Rock Elm**	√	√	√	√
Urtica dioica ssp. dioica	Stinging Nettle	√	√	√	√
Urtica dioica ssp. gracilis	California Nettle	√	√	√	√
Utricularia intermedia	**Flatleaf Bladderwort**	√			√
Utricularia minor	**Lesser Bladderwort**	√	√		√
Utricularia vulgaris	Greater Bladderwort	√	√	√	√
Uvularia grandiflora	Large-flowered Bellwort	√	√		√
Vaccaria hispanica	Cowcockle	√			
Vaccinium angustifolium	**Late Lowbush Blueberry**	√	√		√
Vaccinium corymbosum	**Highbush Blueberry**	√	√		
Vaccinium macrocarpon	**Large Cranberry**	√			√
Vaccinium myrtilloides	**Velvetleaf Blueberry**	√	√		√
Vaccinium oxycoccos	**Small Cranberry**	√	√		√
Vaccinium pallidum	**Early Lowbush Blueberry**	√			
Valeriana officinalis	Common Valerian	√	√		
Verbascum blattaria	White Moth Mullein	√	√		
Verbascum phlomoides	Clasping-leaf Mullein	√			
Verbascum thapsus	Great Mullein	√	√	√	√
Verbena hastata	Blue Vervain	√	√	√	√
Verbena simplex	Narrow-leaved Vervain	√			
Verbena stricta	**Hoary Vervain**	√			
Verbena urticifolia	White Vervain	√	√	√	√
Veronica agrestis	Field Speedwell	√			
Veronica americana	American Speedwell	√	√	√	√
Veronica anagallis-aquatica	Water Speedwell	√	√	√	√
Veronica arvensis	Corn Speedwell	√			
Veronica catenata	Sessile Water-speedwell	√	√		
Veronica chamaedrys	Germander Speedwell	√			
Veronica longifolia	Long-leaf Speedwell	√			
Veronica officinalis	Gypsy-weed	√	√	√	√
Veronica persica	Persian Speedwell	√			
Veronica scutellata	**Marsh Speedwell**	√	√		√
Veronica serpyllifolia ssp. serpyllifolia	Thyme-leaf Speedwell	√	√	√	√
Viburnum acerifolium	Maple-leaf Viburnum	√	√	√	√
Viburnum cassinoides	**Northern Wild-raisin**	√			√
Viburnum lantana	Wayfaring-tree	√	√		√
Viburnum lantanoides	**Hobblebush**	√	√		√
Viburnum lentago	Nannyberry	√	√	√	√
Viburnum opulus	Guelder-rose Viburnum	√	√	√	√
Viburnum rafinesquianum	**Downy Arrowwood**	√	√		√
Viburnum recognitum	Southern Arrow-wood	√			
Viburnum trilobum	Highbush Cranberry	√	√	√	√
Vicia cracca	Tufted Vetch	√	√	√	√
Vicia sativa ssp. nigra	Narrow-leaved Vetch	√			√
Vicia tetrasperma	Lentil Vetch	√	√		

APPENDIX B

VASCULAR PLANTS OF THE NAI STUDY AREA

Full vascular plant species list across the whole NAI study area, with occurrence in region/county indicated. Species in bold type are regionally rare, following Kaiser (2001).

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Vicia villosa	Shaggy Vetch	√			
Vinca minor	Periwinkle	√	√	√	√
Viola adunca	**Hookedspur Violet**	√	√		
Viola affinis	Lecontes Violet	√	√		
Viola arvensis	Small Wild Pansy	√			
Viola blanda	Sweet White Violet	√	√		√
Viola canadensis	Canada Violet	√	√	√	√
Viola conspersa	American Dog Violet	√	√	√	√
Viola cucullata	Marsh Blue Violet	√	√	√	√
Viola macloskeyi ssp. pallens	**Smooth White Violet**	√	√		√
Viola odorata	Sweet Violet	√			
Viola pubescens	Downy Yellow Violet	√	√	√	√
Viola renifolia	Kidney-leaf White Violet	√	√		√
Viola rostrata	Long-spur Violet	√	√		√
Viola selkirkii	**Selkirk's Violet**	√	√		√
Viola sororia	Common Blue Violet	√	√	√	√
Viola tricolor	Johnny Jumpup	√	√		
Vitis aestivalis	**Summer Grape**	√			
Vitis labrusca	Northern Fox Grape	√			
Vitis riparia	Riverbank Grape	√	√	√	√
Waldsteinia fragarioides	Barren Strawberry	√	√	√	√
Weigela sp.	Weigela species	√			
Wolffia arrhiza	**Spotless Watermeal**	√	√		√
Wolffia borealis	**Dotted Watermeal**	√	√		√
Wolffia columbiana	Columbia Watermeal	√	√		√
Woodwardia virginica	**Virginia Chainfern**	√	√		
Xanthium strumarium	Rough Cocklebur	√	√		
Zannichellia palustris	**Horned Pondweed**	√			
Zanthoxylum americanum	**Northern Prickley Ash**		√		
Zea mays	Indian Corn	√			
Zizania palustris	**Northern Wild Rice**	√			
Zizia aurea	**Common Alexanders**	√			

FAUNA OF THE NAI STUDY AREA

Full fauna species list across the whole NAI study area, with occurrence in region/county indicated.

BIRDS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Empidonax virescens	Acadian Flycatcher	√			
Empidonax alnorum	Alder Flycatcher	√	√	√	√
Botaurus lentiginosus	American Bittern	√	√		
Anas rubripes	American Black Duck	√	√		
Fulica americana	American Coot	√	√		
Corvus brachyrhynchos	American Crow	√	√	√	√
Pluvialis dominica	American Golden-plover	√			
Carduelis tristis	American Goldfinch	√	√	√	√
Falco sparverius	American Kestrel	√	√		√
Anthus rubescens	American Pipit	√			
Setophaga ruticilla	American Redstart	√	√	√	√
Turdus migratorius	American Robin	√	√	√	√
Spizella arborea	American Tree Sparrow	√	√		
Anas americana	American Wigeon	√			
Scolopax minor	American Woodcock	√	√	√	√
Calidris bairdii	Baird's Sandpiper	√			
Haliaeetus leucocephalus	Bald Eagle	√	√	√	√
Icterus galbula	Baltimore Oriole	√	√	√	√
Riparia riparia	Bank Swallow	√	√	√	√
Tyto alba	Barn Owl	√			
Hirundo rustica	Barn Swallow	√	√	√	√
Branta leucpsis	Barnacle Goose	√			
Strix varia	Barred Owl	√	√		
Bucephala islandica	Barrow's Goldeneye	√			
Dendroica castanea	Bay-breasted Warbler	√	√		
Ceryle alcyon	Belted Kingfisher	√	√	√	√
Thryomanes bewickii	Bewick's Wren	√			
Chlidonias niger	Black Tern	√			
Mniotilta varia	Black-and-white Warbler	√	√	√	√
Picoides arcticus	Black-backed Woodpecker	√			
Pluvialis squatarola	Black-bellied Plover	√			
Coccyzus erythropthalmus	Black-billed Cuckoo	√	√	√	√
Dendroica fusca	Blackburnian Warbler	√	√		√
Poecile atricapillus	Black-capped Chickadee	√	√	√	√
Nycticorax nycticorax	Black-crowned Night-heron	√	√		
Dendroica striata	Blackpoll Warbler	√	√		
Dendroica caerulescens	Black-throated Blue Warbler	√	√	√	√
Dendroica virens	Black-throated Green Warbler	√	√	√	√
Cyanocitta cristata	Blue Jay	√	√	√	√
Polioptila caerulea	Blue-grey Gnatcatcher	√			
Vireo solitarius	Blue-headed Vireo	√	√		√
Anas discors	Blue-winged Teal	√	√		
Vermivora pinus	Blue-winged Warbler	√	√	√	√
Dolichonyx oryzivorus	Bobolink	√	√	√	√
Bombycilla garrulus	Bohemian Waxwing	√	√		
Larus philadelphia	Bonaparte's Gull	√			

FAUNA OF THE NAI STUDY AREA

Full fauna species list across the whole NAI study area, with occurrence in region/county indicated.

BIRDS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Poecile hudsonicus	Boreal Chickadee		√		
Branta bernicla	Brant	√			
Vermivora x "Brewster's"	Brewster's Warbler	√			
Buteo platypterus	Broad-winged Hawk	√	√		√
Certhia americana	Brown Creeper	√	√	√	√
Toxostoma rufum	Brown Thrasher	√	√	√	√
Molothrus ater	Brown-headed Cowbird	√	√	√	√
Bucephala albeola	Bufflehead	√			
Branta canadensis	Canada Goose	√	√	√	√
Wilsonia canadensis	Canada Warbler	√	√	√	√
Aythya valisineria	Canvasback	√			
Dendroica tigrina	Cape May Warbler	√	√		
Thryothorus ludovicianus	Carolina Wren	√	√	√	
Sterna caspia	Caspian Tern	√		√	
Bombycilla cedrorum	Cedar Waxwing	√	√	√	√
Dendroica cerulea	Cerulean Warbler	√	√		
Dendroica pensylvanica	Chestnut-sided Warbler	√	√	√	√
Chaetura pelagica	Chimney Swift	√	√		√
Spizella passerina	Chipping Sparrow	√	√	√	√
Anas cyanoptera	Cinnamon Teal	√			
Spizella pallida	Clay-colored Sparrow	√	√	√	√
Petrochelidon pyrrhonota	Cliff Swallow	√	√	√	√
Bucephala clangula	Common Goldeneye	√	√		
Quiscalus quiscula	Common Grackle	√	√	√	√
Gavia immer	Common Loon	√	√	√	
Mergus merganser	Common Merganser	√	√		
Gallinula chloropus	Common Moorhen	√			
Chordeiles minor	Common Nighthawk	√	√		
Corvus corax	Common Raven	√	√	√	√
Carduelis flammea	Common Redpoll	√	√		
Gallinago gallinago	Common Snipe	√	√		
Sterna hirundo	Common Tern	√			
Geothlypis trichas	Common Yellowthroat	√	√	√	√
Oporornis agilis	Connecticut Warbler	√	√		
Accipiter cooperii	Cooper's Hawk	√	√		√
Junco hyemalis	Dark-eyed Junco	√	√		
Spiza americana	Dickcissel	√			
Phalacrocorax auritus	Double-crested Cormorant	√	√		
Picoides pubescens	Downy Woodpecker	√	√	√	√
Calidris alpina	Dunlin	√			
Sialia sialis	Eastern Bluebird	√	√		√
Tyrannus tyrannus	Eastern Kingbird	√	√	√	√
Sturnella magna	Eastern Meadowlark	√	√	√	√
Sayornis phoebe	Eastern Phoebe	√	√	√	√
Otus asio	Eastern Screech-owl	√	√	√	
Pipilo erythrophthalmus	Eastern Towhee	√	√	√	√

FAUNA OF THE NAI STUDY AREA

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BIRDS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Contopus virens	Eastern Wood-pewee	√	√	√	√
Sturnus vulgaris	European Starling	√	√	√	√
Coccothraustes vespertinus	Evening Grosbeak	√	√		
Spizella pusilla	Field Sparrow	√	√	√	√
Passerella iliaca	Fox Sparrow	√	√		
Anas strepera	Gadwall	√			
Larus hyperboreus	Glaucous Gull	√			
Regulus satrapa	Golden-crowned Kinglet	√	√		√
Vermivora chrysoptera	Golden-winged Warbler	√	√		
Ammodramus savannarum	Grasshopper Sparrow	√	√		√
Dumetella carolinensis	Gray Catbird	√	√	√	√
Catharus minimus	Gray-cheeked Thrush	√	√		
Larus marinus	Great Black-backed Gull	√	√		
Ardea herodias	Great Blue Heron	√	√	√	√
Phalacrocorax carbo	Great Cormorant	√			
Myiarchus crinitus	Great Crested Flycatcher	√	√	√	√
Ardea alba	Great Egret	√			
Strix nebulosa	Great Gray Owl	√	√		
Bubo virginianus	Great Horned Owl	√	√	√	√
Aythya marila	Greater Scaup	√			
Tringa melanoleuca	Greater Yellowlegs	√			
Butorides virescens	Green Heron	√	√	√	√
Anas crecca	Green-winged Teal	√			
Picoides villosus	Hairy Woodpecker	√	√	√	√
Histrionicus histrionicus	Harlequin Duck	√			
Catharus guttatus	Hermit Thrush	√	√		√
Larus argentatus	Herring Gull	√	√		
Carduelis hornemanni	Hoary Redpoll	√			
Lophodytes cucullatus	Hooded Merganser	√	√		√
Wilsonia citrina	Hooded Warbler	√	√		√
Podiceps auritus	Horned Grebe	√			
Eremophila alpestris	Horned Lark	√	√	√	√
Carpodacus mexicanus	House Finch	√	√	√	√
Passer domesticus	House Sparrow	√	√	√	√
Troglodytes aedon	House Wren	√	√	√	√
Limosa haemastica	Hudsonian Godwit	√			
Larus glaucoides	Iceland Gull	√	√		
Passerina cyanea	Indigo Bunting	√	√	√	√
Charadrius vociferus	Killdeer	√	√	√	√
Calcarius lapponicus	Lapland Longspur	√	√		√
Ixobrychus exilis	Least Bittern	√			
Empidonax minimus	Least Flycatcher	√	√	√	√
Calidris minutilla	Least Sandpiper	√	√		
Larus fuscus	Lesser Black-backed Gull	√			
Aythya affinis	Lesser Scaup	√			
Tringa flavipes	Lesser Yellowlegs	√	√		

FAUNA OF THE NAI STUDY AREA

Full fauna species list across the whole NAI study area, with occurrence in region/county indicated.

BIRDS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Melospiza lincolnii	Lincoln's Sparrow	√	√		√
Lanius ludovicianus	Loggerhead Shrike	√	√		
Asio otus	Long-eared Owl	√	√		
Clangula hyemalis	Long-tailed Duck	√			
Seiurus motacilla	Louisiana Waterthrush	√			
Dendroica magnolia	Magnolia Warbler	√	√	√	√
Anas platyrhynchos	Mallard	√	√	√	√
Cistothorus palustris	Marsh Wren	√		√	√
Falco columbarius	Merlin	√	√		
Cottus bairdii	Mottled Sculpin		√		
Zenaida macroura	Mourning Dove	√	√	√	√
Oporornis philadelphia	Mourning Warbler	√	√	√	√
Cygnus olor	Mute Swan	√	√		
Vermivora ruficapilla	Nashville Warbler	√	√	√	√
Cardinalis cardinalis	Northern Cardinal	√	√	√	√
Colaptes auratus	Northern Flicker	√	√	√	√
Accipiter gentilis	Northern Goshawk	√	√		√
Circus cyaneus	Northern Harrier	√	√	√	√
Mimus polyglottos	Northern Mockingbird	√	√		√
Parula americana	Northern Parula	√			√
Anas acuta	Northern Pintail	√	√		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	√	√	√	√
Aegolius acadicus	Northern Saw-whet Owl	√	√		
Anas clypeata	Northern Shoveler	√	√		
Lanius excubitor	Northern Shrike	√	√		√
Seiurus noveboracensis	Northern Waterthrush	√	√	√	√
Contopus cooperi	Olive-sided Flycatcher	√	√		
Vermivora celata	Orange-crowned Warbler	√	√		
Icterus spurius	Orchard Oriole	√			
Pandion haliaetus	Osprey	√	√	√	√
Seiurus aurocapilla	Ovenbird	√	√	√	√
Calidris melanotos	Pectoral Sandpiper	√			
Falco peregrinus	Peregrine Falcon	√	√		
Vireo philadelphicus	Philadelphia Vireo	√	√		
Podilymbus podiceps	Pied-billed Grebe	√			
Dryocopus pileatus	Pileated Woodpecker	√	√	√	√
Pinicola enucleator	Pine Grosbeak	√	√		
Carduelis pinus	Pine Siskin	√	√	√	√
Dendroica pinus	Pine Warbler	√	√	√	√
Stercorarius pomarinus	Pomarine Jaeger	√			
Protonotaria citrea	Prothonotary Warbler	√			
Carpodacus purpureus	Purple Finch	√	√	√	√
Progne subis	Purple Martin	√	√		
Loxia curvirostra	Red Crossbill	√			
Calidris canutus	Red Knot	√			

FAUNA OF THE NAI STUDY AREA

Full fauna species list across the whole NAI study area, with occurrence in region/county indicated.

BIRDS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Melanerpes carolinus	Red-bellied Woodpecker	√	√		√
Mergus serrator	Red-breasted Merganser	√			
Sitta canadensis	Red-breasted Nuthatch	√	√	√	√
Vireo olivaceus	Red-eyed Vireo	√	√	√	√
Aythya americana	Redhead	√	√		
Melanerpes erythrocephalus	Red-headed Woodpecker	√	√		
Podiceps grisegena	Red-necked Grebe	√			
Palaropus lobatus	Red-necked Phalarope	√			
Buteo lineatus	Red-shouldered Hawk	√	√		
Buteo jamaicensis	Red-tailed Hawk	√	√	√	√
Gavia stellata	Red-throated Loon	√			
Agelaius phoeniceus	Red-winged Blackbird	√	√	√	√
Larus delawarensis	Ring-billed Gull	√	√	√	√
Aythya collaris	Ring-necked Duck	√			
Phasianus colchicus	Ring-necked Pheasant	√	√		
Columba livia	Rock Pigeon	√	√	√	√
Pheucticus ludovicianus	Rose-breasted Grosbeak	√	√	√	√
Buteo lagopus	Rough-legged Hawk	√	√		√
Regulus calendula	Ruby-crowned Kinglet	√	√	√	√
Archilochus colubris	Ruby-throated Hummingbird	√	√	√	√
Oxyura jamaicensis	Ruddy Duck	√			
Arenaria interpres	Ruddy Turnstone	√			
Bonasa umbellus	Ruffed Grouse	√	√	√	√
Euphagus carolinus	Rusty Blackbird	√	√		
Calidris alba	Sanderling	√			
Grus canadensis	Sandhill Crane	√			
Passerculus sandwichensis	Savannah Sparrow	√	√	√	√
Piranga olivacea	Scarlet Tanager	√	√		√
Cistothorus platensis	Sedge Wren	√		√	
Charadrius semipalmatus	Semipalmated Plover	√			
Calidris pusilla	Semipalmated Sandpiper	√			
Accipiter striatus	Sharp-shinned Hawk	√	√		√
Limnodromus griseus	Short-billed Dowitcher	√			
Asio flammeus	Short-eared Owl	√			
Plectrophenax nivalis	Snow Bunting	√	√	√	√
Chen caerulescens	Snow Goose	√			
Egretta thula	Snowy Egret	√			
Nyctea scandiaca	Snowy Owl	√	√		
Tringa solitaria	Solitary Sandpiper	√	√	√	
Melospiza melodia	Song Sparrow	√	√	√	√
Porzana carolina	Sora	√			
Actitis macularius	Spotted Sandpiper	√	√	√	√
Calidris himantopus	Stilt Sandpiper	√			
Catharus ustulatus	Swainson's Thrush	√	√		
Melospiza georgiana	Swamp Sparrow	√	√	√	√
Vermivora peregrina	Tennessee Warbler	√	√		

FAUNA OF THE NAI STUDY AREA

Full fauna species list across the whole NAI study area, with occurrence in region/county indicated.

BIRDS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Larus thayeri	Thayer's Gull	√			
Tachycineta bicolor	Tree Swallow	√	√	√	√
Cygnus buccinator	Trumpeter Swan	√		√	√
Baeolophus bicolor	Tufted Titmouse	√	√		
Cygnus columbianus	Tundra Swan	√	√		
Cathartes aura	Turkey Vulture	√	√	√	√
Bartramia longicauda	Upland Sandpiper	√	√		
Catharus fuscescens	Veery	√	√	√	√
Pooecetes gramineus	Vesper Sparrow	√	√	√	√
Rallus limicola	Virginia Rail	√	√	√	√
Vireo gilvus	Warbling Vireo	√	√	√	√
Calidris mauri	Western Sandpiper	√			
Numenius phaeopus	Whimbrel	√			
Caprimulgus vociferus	Whip-poor-will	√	√		
Sitta carolinensis	White-breasted Nuthatch	√	√	√	√
Zonotrichia leucophrys	White-crowned Sparrow	√	√		√
Vireo griseus	White-eyed Vireo	√			
Calidris fuscicollis	White-rumped Sandpiper	√			
Zonotrichia albicollis	White-throated Sparrow	√	√	√	√
Loxia leucoptera	White-winged Crossbill	√	√		
Melanitta fusca	White-winged Scoter	√			
Meleagris gallopavo	Wild Turkey	√	√	√	√
Tringa semipalmata	Willet	√			
Empidonax traillii	Willow Flycatcher	√	√	√	
Gallinago delicata	Wilson's Snipe	√	√		√
Wilsonia pusilla	Wilson's Warbler	√	√		
Troglodytes troglodytes	Winter Wren	√	√	√	√
Aix sponsa	Wood Duck	√	√		√
Hylocichla mustelina	Wood Thrush	√	√	√	√
Dendroica palmarum	Yellow Palm Warbler	√	√		√
Dendroica petechia	Yellow Warbler	√	√	√	√
Empidonax flaviventris	Yellow-bellied Flycatcher	√	√		
Sphyrapicus varius	Yellow-bellied Sapsucker	√	√	√	√
Coccyzus americanus	Yellow-billed Cuckoo	√	√		√
Icteria virens	Yellow-breasted Chat	√	√		
Dendroica coronata	Yellow-rumped Warbler	√	√	√	√
Vireo flavifrons	Yellow-throated Vireo	√	√		√
Dendroica dominica	Yellow-throated Warbler	√			

FAUNA OF THE NAI STUDY AREA

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FISH

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Alosa pseudoharengus	Alewife	√			
Anguilla rostrata	American Eel		√		
Salmo salar	Atlantic Salmon	√	√		
Lampetra appendix	American Brook Lamprey	√	√		
Pomoxis nigromaculatus	Black Crappie	√		√	
Rhinichthys atratulus	Blacknose Dace	√	√		√
Notropis heterolepis	Blacknose Shiner	√			
Lepomis macrochirus	Bluegill			√	
Pimephales notatus	Bluntnose Minnow	√	√	√	√
Hybognathus hankinsoni	Brassy Minnow	√	√	√	
Culaea inconstans	Brook Stickleback	√	√	√	√
Salvelinus fontinalis	Brook Trout	√	√	√	√
Ameiurus nebulosus	Brown Bullhead	√		√	
Salmo trutta	Brown Trout	√	√		√
Umbra limi	Central Mudminnow	√	√	√	√
Ictalurus punctatus	Channel Catfish	√			
Oncorhynchus tshawytscha	Chinook Salmon	√	√		
Cyprinus carpio	Common Carp	√	√		
Luxilus cornutus	Common Shiner	√	√	√	√
Semotilus atromaculatus	Creek Chub	√	√	√	√
Rhinichthys atratulus	Eastern Blacknose Dace	√	√	√	√
Notropis atherinoides	Emerald Shiner	√			
Etheostoma flabellare	Fantail Darter	√	√		
Pimephales promelas	Fathead Minnow	√	√	√	√
Phoxinus neogaeus	Finescale Dace	√		√	
Aplodinotus grunniens	Freshwater Drum	√			
Dorosoma cepedianum	Gizzard Shad	√			
Notemigonus crysoleucas	Golden Shiner	√		√	√
Hiodon alosoides	Goldeye		√		
Carassius auratus	Goldfish	√			
Nocomis biguttatus	Hornyhead Chub	√	√		
Etheostoma exile	Iowa Darter	√	√	√	
Etheostoma nigrum	Johnny Darter	√	√	√	
Micropterus salmoides	Largemouth Bass	√	√	√	√
Rhinichthys cataractae	Longnose Dace	√	√		√
Cottus bairdii	Mottled Sculpin	√	√		
Hypentelium nigricans	Northern Hog Sucker	√	√		
Phoxinus eos	Northern Redbelly Dace	√	√	√	√
Esox lucius	Northern Pike	√		√	
Margariscus margarita	Pearl Dace	√	√		√
Lepomis gibbosus	Pumpkinseed	√	√	√	√
Etheostoma caeruleum	Rainbow Darter	√	√		
Osmerus mordax	Rainbow Smelt	√			
Oncorhynchus mykiss	Rainbow Trout	√	√		
Clinostomus elongatus	Redside Dace	√	√		

FAUNA OF THE NAI STUDY AREA

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FISH

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Nocomis micropogon	River Chub	√	√		√
Ambloplites rupestris	Rock Bass	√	√	√	√
Neogobius melanostomus	Round Goby	√			
Micropterus dolomieu	Smallmouth Bass	√			
Notropis hudsonius	Spottail Shiner	√			√
Noturus flavus	Stonecat	√	√		
Gasterosteus aculeatus	Threespine Stickleback	√			
Morone chrysops	White Bass	√			
Catostomus commersonii	White Sucker	√	√	√	√
Perca flavescens	Yellow Perch	√		√	√

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BUTTERFLIES, SKIPPERS AND MOTHS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Satyrium acadicum	Acadian Hairstreak	√	√	√	√
Lycaena phlaeas	American Copper	√	√		√
Vanessa virginiensis	American Painted Lady	√	√	√	√
Libytheana carinenta	American Snout		√		
Speyeria aphrodite	Aphrodite Fritillary	√			
Satyrodes appalachia	Appalachian Brown	√	√	√	√
Carterocephalus palaemon	Arctic Skipper	√	√	√	√
Speyeria atlantis	Atlantis Fritillary		√		
Euphydryas phaeton	Baltimore Checkerspot		√		
Satyrium calanus	Banded Hairstreak	√	√		
Limenitis arthemis arthemis	Banded Purple	√	√	√	√
Pantographa limata	Basswood Leafroller Moth		√		
Eudryas grata	Beautiful Wood-nymph	√			
Pachysphinx modesta	Big Poplar Sphinx		√		
Papilio polyxenes	Black Swallowtail	√	√		
Lithacodia synochitis	Black-dotted Lithacodia		√		
Lomographa semiclarata	Bluish Spring Moth	√			
Lycaena hyllus	Bronze Copper	√	√		
Calledapteryx dryopterata	Brown Scoopwing		√		
Cucullia convexipennis	Brown-bordered Cucullia	√			
Pieris rapae	Cabbage White	√	√	√	√
Papilio canadensis	Canadian Tiger Swallowtail	√	√	√	√
Anagrapha falcifera	Celery Looper Moth	√			
Celastrina serotina	Cherry Gall Azure		√		
Haematopis grataria	Chickweed Geometer		√		
Spaelotis clandestina	Clandestine Dart	√			
Colias philodice	Clouded Sulphur	√	√	√	√
Phoebis sennae	Cloudless Sulphur	√			
Caenergina crassiuscula	Clover Looper Moth		√		
Erynnis lucilius	Columbine Duskywing	√	√		
Autographa pseudogamma	Common Looper Moth	√			
Coenonympha tullia	Common Ringlet	√	√	√	√
Amblyscirtes vialis	Common Roadside Skipper		√		
Pholisora catullus	Common Sootywing	√			√
Colias philodice	Common Sulphur		√		
Cercyonis pegala	Common Wood-Nymph	√	√	√	√
Nymphalis vaualbum	Compton Tortoiseshell		√		
Eusarca confusaria	Confused Eusarca		√		
Haploa confusa	Confused Haploa				√
Harkenclenus titus	Coral Hairstreak	√	√		
Xanthotype sospeta	Crocus Geometer	√			
Polites origenes	Crossline Skipper	√	√	√	
Cutworm Moth	Cutworm Moth	√			
Anatrytone logan	Delaware Skipper	√	√	√	√
Erynnis icelus	Dreamy Duskywing	√	√		

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Euphyes vestris	Dun Skipper	√	√	√	√
Polygonia comma	Eastern Comma	√	√	√	
Crambus laqueatellus	Eastern Grass-veneer Moth		√		
Everes comyntas	Eastern Tailed Blue	√	√		
Malacosoma americanum	Eastern Tent Caterpillar Moth	√	√		
Papilio glaucus	Eastern Tiger Swallowtail	√	√		√
Alypia octomaculata	Eight-spotted Forester		√		
Coleophora limosipenella	Elm Casebearer Moth		√		
Ostrinia nubialis	European Corn Borer Moth	√			
Thymelicus lineola	European Skipper	√	√	√	√
Satyrodes eurydice	Eyed Brown	√	√	√	√
Alsophila pometaria	Fall Cankerworm Moth		√		
Xanthotype urticaria	False Crocus Geometer		√		
Amolita fessa	Feeble Grass Moth	√			
Caenurgina erechtea	Forage Looper Moth		√		
Chlosyne gorgone	Gorgone Crescentspot	√			
Psychomorpha epimenis	Grapevine Epimenis		√		
Lomographa glomeraria	Gray Spring Moth		√		
Zanclognatha pedipilalis	Grayish Zanclognatha	√			
Speyeria cybele	Great Spangled Fritillary	√	√	√	√
Hypena scabra	Green Cloverworm Moth	√			
Lymantria dispar	Gypsy Moth	√	√		
Satyrium caryaevorum	Hickory Hairstreak	√			
Poanes hobomok	Hobomok Skipper	√	√	√	√
Nematocampa limbata	Horned Spanworm Moth		√		
Hemaris thysbe	Hummingbird Clearwing		√		
Pyrrharctia isabella	Isabella Tiger Moth	√	√		√
Erynnis juvenalis	Juvenal's Duskywing	√	√		√
Xanthorhoe labradorensis	Labrador Carpet		√		
Scopula limboundata	Large Lace-border	√			
Ancyloxypha numitor	Least Skipper	√	√	√	√
Deidamia inscripta	Lettered Sphinx	√			
Pompeius verna	Little Glassywing		√		
Megisto cymela	Little Wood-Satyr	√	√	√	√
Polites mystic	Long Dash Skipper	√	√	√	√
Boloria bellona	Meadow Fritillary	√	√		
Pyralis farinalis	Meal Moth	√			
Aglais milberti	Milbert's Tortoiseshell	√			
Euchaetes egle	Milkweed Tussock Moth	√			
Danaus plexippus	Monarch	√	√	√	√
Chytolita morbidalis	Morbid Owlet		√		
Nymphalis antiopa	Mourning Cloak	√	√	√	√
Poanes massasoit	Mulberry Wing	√			
Pieris oleracea	Mustard White	√	√		√
Wallengrenia egeremet	Northern Broken-Dash	√	√		
Thorybes pylades	Northern Cloudywing	√	√		

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SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Phyciodes pascoensis	Northern Crescent	√	√	√	√
Enodia anthedon	Northern Pearly-Eye	√	√	√	√
Choristoneura rosaceana	Oblique-banded Leafroller Moth	√			
Catocala unijuga	Once-married Underwing	√			
Phyciodes cocyta	Orange (Northern) Crescent		√		
Colias eurytheme	Orange Sulphur	√	√		√
Vanessa cardui	Painted Lady	√	√		
Campaea perlata	Pale Beauty	√	√		
Depressaria heracliana	Parsnip Webworm	√			
Phyciodes tharos	Pearl Crescent	√	√		√
Polites peckius	Peck's Skipper	√	√	√	√
Eufidonia notataria	Powder Moth		√		
Schinia florida	Primrose Moth		√		
Polygonia interrogationis	Question Mark	√	√		√
Vanessa atalanta	Red Admiral	√	√		√
Xanthorhoe ferrugata	Red Twin-spot		√		
Nemoria rubrifrontaria	Red-fronted Emerald		√		
Limenitis arthemis astyanax	Red-spotted Purple	√	√	√	√
Argyrostrotis anilis	Short-lined Chocolate		√		
Boloria selene	Silver-bordered Fritillary	√	√	√	√
Epargyreus clarus	Silver-spotted Skipper	√	√		√
Glaucopsyche lygdamus	Silvery Blue	√	√	√	√
Phigalia strigataria	Small Phigalia	√			
Paonias myops	Small-eyed Sphinx	√			
Eugonobapta nivosaria	Snowy Geometer		√		
Rheumaptera hastata	Spear-marked Black		√		
Thyris maculata	Spotted Thyris	√			
Celastrina argiolus	Spring Azure	√	√		√
Satyrium liparops	Striped Hairstreak		√		
Celastrina neglecta	Summer Azure	√		√	√
Phyciodes batesii	Tawny Crescent	√			
Holomelina opella	Tawny Holomelina	√			
Polites themistocles	Tawny-edged Skipper	√	√	√	√
Dyspteris abortivaria	The Bad Wing		√		
Eubaphe mendica	The Beggar		√		
Scoliopteryx libatrix	The Herald	√			
Calophasia lunula	Toadflax Caterpillar		√		
Xanthorhoe lacustrata	Toothed Brown Carpet		√		
Euclidia cuspidea	Toothed Somberwing		√		
Euphyes bimacula	Two-spotted Skipper	√			√
Catocala ultronia	Ultronia Underwing		√		
Euptoieta claudia	Variegated Fritillary		√		
Limenitis archippus	Viceroy	√	√	√	√
Grammia virgo	Virgin Tiger Moth	√			
Ctenucha virginica	Virginia Ctenucha	√	√		√

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BUTTERFLIES, SKIPPERS AND MOTHS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Spilosoma virginica	Virginian Tiger Moth (Yellow Bear)		√		
Limenitis arthemis	White Admiral		√		
Tetracis cachexiata	White Slant-Line		√		
Lomographa vestaliata	White Spring Moth		√		
Anania funebris glomeralis	White-spotted Sable Moth		√		
Trichodezia albovittata	White-striped Black		√		√
Erynnis baptisiae	Wild Indigo Duskywing	√			
Episimus argutanus	Witch-Hazel Leaf-Folder Moth	√			
Tetracis crocallata	Yellow Slant-line		√		

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DRAGONFLIES AND DAMSELFLIES

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Lestes eurinus	Amber-winged Spreadwing	√			
Cordulia shurtleffii	American Emerald	√	√		√
Hetaerina americana	American Rubyspot	√			√
Cordulegaster obliqua	Arrowhead Spiketail		√		√
Gomphus lividus	Ashy Clubtail	√	√		
Chromagrion conditum	Aurora Damsel				√
Sympetrum vicinum	Autumn Meadowhawk	√			√
Sympetrum semicinctum	Band-winged Meadowhawk		√		
Epitheca canis	Beaverpond Baskettail	√	√		
Tramea lacerata	Black Saddlebags	√	√	√	
Aeshna tuberculifera	Black-tipped Darner	√			
Pachydiplax longipennis	Blue Dasher	√	√	√	√
Enallagma boreale	Boreal Bluet	√	√		√
Somatochlora walshii	Brush-tipped Emerald	√	√	√	
Celithemis elisa	Calico Pennant	√		√	√
Aeshna canadensis	Canada Darner	√	√	√	√
Ladona julia	Chalk-fronted Corporal	√	√	√	√
Sympetrum internum	Cherry-faced Meadowhawk	√	√		
Epitheca cynosura	Common Baskettail	√		√	√
Anax junius	Common Green Darner	√	√	√	√
Lestes disjunctus	Common Spreadwing	√	√	√	
Plathemis lydia	Common Whitetail	√	√	√	√
Cordulegaster diastatops	Delta-spotted Spiketail	√	√	√	
Leucorrhinia intacta	Dot-tailed Whiteface	√	√	√	√
Gomphus spicatus	Dusky Clubtail	√	√	√	√
Perithemis tenera	Eastern Amberwing		√		
Ischnura verticalis	Eastern Forktail	√	√	√	√
Erythemis simplicicollis	Eastern Pondhawk	√	√		
Amphiagrion saucium	Eastern Red Damsel	√	√	√	√
Calopteryx maculata	Ebony Jewelwing	√	√	√	√
Lestes inaequalis	Elegant Spreadwing	√			
Lestes dryas	Emerald Spreadwing	√	√	√	√
Enallagma civile	Familiar Bluet	√	√	√	√
Boyeria vinosa	Fawn Darner	√	√		
Libellula quadrimaculata	Four-spotted Skimmer	√	√	√	√
Ischnura posita	Fragile Forktail	√	√		√
Leucorrhinia frigida	Frosted Whiteface	√			√
Anax junius	Green Darner		√		
Enallagma hageni	Hagen's Bluet	√	√	√	√
Gomphaeschna furcillata	Harlequin Darner	√			√
Gomphus descriptus	Harpoon Clubtail	√			
Leucorrhinia hudsonica	Hudsonian Whiteface	√		√	√
Gomphus exilis	Lancet Clubtail	√	√	√	√
Arigomphus furcifer	Lilypad Clubtail	√	√		√
Lestes unguiculatus	Lyre-tipped Spreadwing	√	√		√

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DRAGONFLIES AND DAMSELFLIES

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Enallagma ebrium	Marsh Bluet	√	√	√	√
Enallagma cyathigerum	Northern Bluet	√	√		√
Lestes disjunctus	Northern Spreadwing		√		
Libellula semifasciata	Painted Skimmer	√			
Argia moesta	Powdered Dancer	√			
Epitheca princeps	Prince Baskettail	√		√	√
Gomphus graslinellus	Pronghorn Clubtail				√
Dorocordulia libera	Racket-tailed Emerald	√		√	√
Enallagma antennatum	Rainbow Bluet	√	√		
Leucorrhinia proxima	Red-waisted Whiteface	√			√
Calopteryx aequabilis	River Jewelwing	√	√		√
Sympetrum rubicundulum	Ruby Meadowhawk	√	√	√	√
Nehalennia irene	Sedge Sprite	√	√	√	√
Aeshna umbrosa	Shadow Darner	√	√		
Enallagma geminatum	Skimming Bluet	√			
Lestes rectangularis	Slender Spreadwing	√	√	√	√
Epitheca spinigera	Spiny Baskettail	√	√		√
Lestes congener	Spotted Spreadwing	√	√		√
Basiaeschna janata	Springtime Darner	√			
Enallagma exsulans	Stream Bluet	√		√	√
Epiaeschna heros	Swamp Darner	√			
Lestes vigilax	Swamp Spreadwing	√	√		
Lestes forcipatus	Sweetflag Spreadwing		√		√
Coenagrion resolutum	Taiga Bluet	√			√
Enallagma carunculatum	Tule Bluet	√	√		√
Libellula pulchella	Twelve-spotted Skimmer	√	√	√	√
Cordulegaster maculata	Twin-spotted Spiketail	√	√		
Arigomphus villosipes	Unicorn Clubtail	√	√		
Enallagma vesperum	Vesper Bluet	√			
Argia fumipennis violacea	Violet Dancer	√	√	√	√
Sympetrum obtrusum	White-faced Meadowhawk	√	√	√	√
Libellula luctuosa	Widow Skimmer	√	√	√	√
Somatochlora williamsoni	Williamson's Emerald				√
Stylurus scudderi	Zebra Clubtail		√		

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REPTILES AND AMPHIBIANS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Rana catesbeiana	American Bullfrog	√	√		√
Bufo americanus	American Toad	√	√	√	√
Emydoidea blandingii	Blanding's Turtle	√			
Ambystoma laterale	Blue-spotted Salamander	√			
Nerodia sipedon sipedon	Common Watersnake	√			
Thamnophis sirtalis sirtalis	Eastern Gartersnake	√	√	√	√
Lampropeltis triangulum triangulum	Eastern Milksnake	√	√		√
Notophthalmus viridescens viridescens	Eastern Newt	√	√		√
Plethodon cinereus	Eastern Red-backed Salamander	√	√	√	√
Thamnophis sauritus	Eastern Ribbonsnake		√		
Chelydra serpentina	Eastern Snapping Turtle	√	√	√	√
Hyla versicolor	Gray Treefrog	√	√	√	√
Rana clamitans	Green Frog	√	√	√	√
Ambystoma jeffersonianum	Jefferson Salamander	√	√		
Ambystoma jeffersonianum laterale (DNA unknown)	Jefferson Salamander X Blue-spotted Salamander (DNA unknown)	√	√		
Chrysemys picta marginata	Midland Painted Turtle	√	√	√	√
Rana septentrionalis	Mink Frog	√			
Storeria dekayi dekayi	Northern Brownsnake	√	√		
Rana pipiens	Northern Leopard Frog	√	√	√	√
Graptemys geographica	Northern Map Turtle	√			
Storeria occipitomaculata occipitomaculata	Northern Red-bellied Snake	√	√		√
Rana palustris	Pickerel Frog	√	√		
Trachemys scripta elegans	Red-eared Slider	√	√		
Ambystoma maculatum	Spotted Salamander	√	√		
Pseudacris crucifer	Spring Peeper	√	√	√	√
Pseudacris triseriata	Western Chorus Frog	√	√	√	√
Rana sylvatica	Wood Frog	√	√	√	√

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MAMMALS

SCIENTIFIC NAME	COMMON NAME	PEEL	HALTON	DUFFERIN	WELLINGTON
Mustela vison	American Mink	√	√		√
Castor canadensis	Beaver	√	√	√	√
Eptesicus fuscus	Big Brown Bat	√	√		
Canis latrans	Coyote	√	√	√	√
Peromyscus maniculatus	Deer Mouse	√	√		
Tamias striatus	Eastern Chipmunk	√	√	√	√
Sylvilagus floridanus	Eastern Cottontail	√	√	√	√
Sciurus carolinensis	Eastern Gray Squirrel	√	√	√	√
Pipistrellus subflavus	Eastern Pipistrelle	√	√		
Mustela erminea	Ermine	√	√		
Lepus europaeus	European Hare	√	√		
Parascalops breweri	Hairy-tailed Mole	√	√		
Lasiurus cinereus	Hoary Bat	√	√		
Mus musculus	House Mouse	√	√		
Myotis lucifugus	Little Brown Bat	√	√		
Mustela frenata	Long-tailed Weasel	√	√		
Sorex cinereus	Masked Shrew	√	√		
Zapus hudsonius	Meadow Jumping Mouse	√		√	
Microtus pennsylvanicus	Meadow Vole	√	√		
Ondatra zibethicus	Muskrat	√	√	√	√
Glaucomys sabrinus	Northern Flying Squirrel	√	√		
Myotis septentrionalis	Northern Long-eared Bat	√	√		
Procyon lotor	Northern Raccoon	√	√	√	√
Blarina brevicauda	Northern Short-tailed Shrew	√	√		√
Rattus norvegicus	Norway Rat	√	√		
Erethizon dorsatum	Porcupine	√	√	√	√
Lasiurus borealis	Red Bat	√	√		
Vulpes vulpes	Red Fox	√	√	√	√
Tamiasciurus hudsonicus	Red Squirrel	√	√	√	√
Lutra canadensis	River Otter			√	
Lasionycteris noctivagans	Silver-haired Bat	√	√		
Sorex fumeus	Smoky Shrew	√	√		
Lepus americanus	Snowshoe Hare	√			
Condylura cristata	Star-nosed Mole	√	√		
Mephitis mephitis	Striped Skunk	√	√	√	√
Didelphis virginiana	Virginia Opossum	√	√		
Peromyscus leucopus	White-footed Mouse	√	√		
Odocoileus virginianus	White-tailed Deer	√	√	√	√
Marmota monax	Woodchuck	√	√	√	√
Napaeozapus insignis	Woodland Jumping Mouse	√			