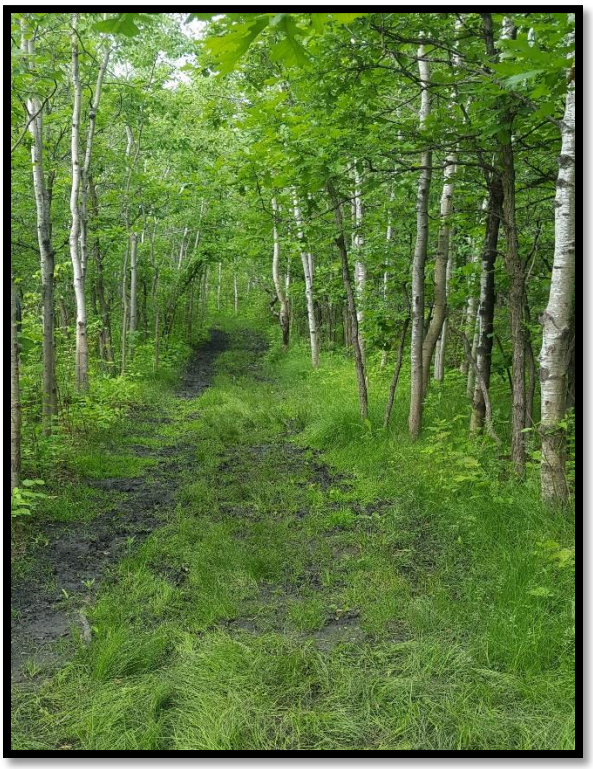
July 2016

GEM Equities Oak Grove Development Project: Biophysical Technical Report



Submitted to:

Gem Equities Inc.
1383 Spruce Street
Winnipeg, Manitoba R3E 2V8

Prepared by:

EcoLogic Environmental Inc.
Wildlife, Aquatic & Geomatics Consulting
PO Box 931
Teulon, Manitoba R0C 3B0

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EXECUTIVE SUMMARY

Gem Equities Inc. owns a parcel of land within the northern area of the Parker Lands Major Re-Development Site with plans to develop this property into a transit-oriented residential community development project. The size and type of development of the lands owned by Gem Equities in association with the Parker Major Re-Development Site does not fall under the Provincial Classes of Development and therefore does not require approval under the *Manitoba Environment Act* or *Canadian Environmental Assessment Act* (CEAA), and does not require an Environment Act License to proceed with development. However, despite that the development of the site does not require an Environment Act License, intensive science-based environmental survey work has been conducted to document the avian, mammal, herptile, and floral species present within the Project Study Area and to assess for the presence of species at risk.

The following Biophysical Technical Report was developed to present the scientific methods and results of the environmental surveys conducted within the Project Study Area to document avian, mammal, herptile, and floral species presence and to assess for the presence of species at risk. Further, this report provides a quantification of the digitization of the trail network present within the Project Study Area, including quantification of the degree of weedy and invasive plant species buffering the trails. Lastly, this report presents the findings of a formal categorization of the wetlands present within the Project Study Area.

Results of the science-based environmental surveys conducted identified no species at risk for birds, mammals, herptile, or plant species. Overall, very little mammal activity was identified and the bird species identified were common species. There were no listed plant species identified.

The Project Study Area appears to be a drainage basin for the neighbouring properties with lands graded to drain into the Project Study Area. As a result, the majority of the footprint is substantially saturated, diminishing the quality of the habitat for a variety of species.

The Project Study Area is characterized by an extensive trail network, with invasive and weedy species spreading outwards from each trail. Over and above the trail network, the Project Study Area has been used considerably for the dumping of garbage and waste, and appears to support a number of areas that may have been used by homeless people for shelter.

Purple loosestrife and European buckthorn were both found to be common in the willow/sedge wet areas and the aspen woodlands within the Project Study Area. Both of these species are listed as Category 2 (Invasive Species Council of Manitoba) and are Principal Invasive Aliens (White et al., 1993). Both of these species produce many seeds that are dispersed by birds and animals. As such, these invasive plants could be detrimental to adjacent green spaces within the city as avian and terrestrial wildlife species could spread these seeds into other greenspace areas.

A number of patches of swamp milkweed (*Asclepias incarnata*) were observed in the middle and north areas of the Project Study Area. These plants provide critical habitat and food for Monarch butterflies (*Danaus plexippus*) and should be preserved or replaced wherever possible, in accordance with the proposed Environment Canada Species at Risk Act Management Plan for the Monarch (Environment Canada 2014).

The wetland areas were categorized as a mix of Class I, II, and III, with one potential Class IV wetland; however, all of the wetland areas were degraded by garbage dumping and woody species encroachment.

1 INTRODUCTION

Gem Equities Inc. (Gem Equities) owns a parcel of land within the northern area of the Parker Lands Major Re-Development Site with plans to develop this property into a transit-oriented residential community development project (TOD). The size and type of development of the lands owned by Gem Equities in association with the Parker Major Re-Development Site does not fall under the Provincial Classes of Development and therefore does not require approval under the *Manitoba Environment Act* or *Canadian Environmental Assessment Act* (CEAA), and does not require an Environment Act License to proceed with development. However, despite that the development of the site does not require an Environment Act License, intensive environmental survey work has been conducted to document the avian, mammal, herptile, and floral species present within the Project Study Area and to assess for the presence of species at risk. The biophysical environmental survey work conducted within the Project Study Area followed peer-reviewed scientific methodologies widely used and accepted by Manitoba Conservation and Water Stewardship, the provincial regulatory body for environmental assessments in Manitoba. In conjunction with the environmental survey work conducted, the trail network within the Project Study Area was digitized and quantified along with the quantification of weedy and invasive plant species spread buffering the trails. Lastly, a formal categorization of the wetlands located within the Project Study Area was undertaken.

2 PROJECT STUDY AREA

The Gem Equities development property within the Parker Lands is approximately 19.22 ha in size and falls within a landscape historically typical of prairie and parkland environments (Smith et al., 1998). For the purpose of this report, the Project Study Area is defined as the footprint of the property owned by Gem Equities (**Map 1**). The Project Study Area is located: to the south of the CN railroad line that runs parallel to Taylor Avenue; to the east of the Winnipeg Humane Society property; and to the north of the future City of Winnipeg Bus Rapid Transit Corridor and existing Manitoba Hydro transmission line corridor. For more detail regarding the Project Study Area, please see The Oak Grove Development Project - Environmental Background Technical Report (EcoLogic, 2016).

3 DESKTOP ANALYSIS

Desktop studies were conducted prior to field investigations. Initially, a review was conducted of the legislative status for species at risk that were listed both locally, under the *Manitoba Endangered Species and Ecosystem Protection Act* (2015), and nationally, under the CEAA (2012). Reviews of these Acts, in conjunction with information from the Manitoba Conservation Data Centre (MBCDC) and Committee on the Status of Endangered Wildlife in Canada (COSEWIC) were used to generate a database of potential listed species within the Project Study Area (**Table 1**).

Under the *Federal Species at Risk Act* (2002) and the *Manitoba Endangered Species and Ecosystem Protection Act* (2015), all species that are listed under these acts are protected by regulation. A listed species refers to species that has been identified as a species at risk, meaning a species that may be ranked as extirpated, endangered, threatened, or of special concern. For listed species, no person(s) shall damage or destroy the residence of one or more individuals of a wildlife or plant species that is listed. In Manitoba, detailed records on the provincial animals, plants, and plant communities at risk, together with their known locations, are maintained by the MBCDC. The MBCDC ranks species according to their abundance and on the basis of their range-wide (global - G) status, and their province-wide (subnational - S) status according to a standardized procedure used by all Conservation Data Centres and Natural Heritage Programs.

Table 1: Mammal, Bird, Arthropod, Amphibian and Reptile Species of Conservation Concern Possibly Present within the Project Study Area

Common Name	Scientific Name	MESA Status	COSEWIC Status	SARA Status
Amphibians and Reptiles				
Northern Leopard Frog	*Lithobates pipiens*	Not Listed	Special Concern	Special Concern
Arthropods				
Monarch Butterfly	*Danaus plexippus*	Not Listed	Special Concern	Special Concern
Birds				
Bank Swallow	*Riparia riparia*	Not Listed	Threatened	Not Listed
Barn Swallow	*Hirundo rustica*	Not Listed	Threatened	Not Listed
Bobolink	*Dolichonyx oryzivorus*	Not Listed	Threatened	Not Listed
Eastern Wood-Pewee	*Contopus virens*	Not Listed	Special Concern	Not Listed
Peregrine Falcon	*Falco peregrinus anatum/tundrius*	Endangered	Special Concern	Special Concern
Short-Eared Owl	*Asio flammeus*	Threatened	Special Concern	Special Concern
Yellow Rail	*Coturnicops noveboracensis*	Not Listed	Special Concern	Special Concern
Mammals				
Little Brown Myotis	*Myotis lucifugus*	Not Listed	Endangered	Not Listed
Northern Myotis	*Myotis septentrionalis*	Not Listed	Endangered	Not Listed

3.1 Habitat Assessment

Prior to field work, the habitat (natural environment of an organism; place that is natural for the life and growth of an organism) within the Project Study Area was assessed, using ArcGIS 10.1 (ESRI Systems). The City of Winnipeg has developed a digitized delineation of habitat within the Project Study Area based on aerial/satellite imagery. Using the City of Winnipeg Habitat spatial layer, the habitat was quantified by type and assessed for mammal, bird, and herptile species at risk and their potential presence within the Project Study Area. **Map 2** illustrates the City of Winnipeg habitat layer for the Project Study Area. **Table 2** provides a characterization of the habitat types located within the Project Study Area based on the City of Winnipeg Habitat layer.

Table 2 Habitat Types Found within the Project Study Area as Categorized by the City of Winnipeg

Habitat Type	Area (Hectares)	Proportion (Percentage)
Aspen	10.39	54%
Grassland	3.44	18%
Wetland	5.40	28%
Total Area	19.22	100%

3.2 Mapping and Survey Planning

Using the property footprint spatial data provided by Gem Equities, EcoLogic processed these data to enable mapping, which included projecting line files, and converting all data to a georeferenced shapefile that could be uploaded to hand held Global Positioning Systems (GPS) units for field work. Survey transects, spaced 10 m apart, were generated and loaded into GPS units. Waypoint locations of wildlife, plant, and other observations made during field surveys were recorded using handheld GPS units and projected in ArcGIS 10.1 (ESRI Systems) for map generation and to display the locations of observations made within the Project Study Area.

4 VEGETATION SURVEYS

Pedestrian surveys of the vegetation located within the Project Study Area were conducted on June 6, July 12, and 14, 2016. The goal of these surveys was to:

- identify any plants species of conservation concern;
- record the incursion of non-native plants; and
- record the plant species diversity within the Project Study Area.

During these survey, both native (species that are within their natural past or present distribution and are not alien) and non-native plants were identified. Non-native or invasive alien species are introduced species where their spread threatens the environment, the economy, or society, including human health. Invasive alien species spread can cause negative effects in relatively natural or undisturbed areas and usually originate from other countries or continents. During the Pedestrian surveys, the criteria for the listing of Invasive Species Council of Manitoba (ISCM) for Invasive Terrestrial Plants (Category 2) was used, which identifies the invasive plants present in Manitoba, as well as plants that are capable of further spread with pathways for spread present.

During the surveys, areas supporting invasive species were marked with waypoints and photographed for future reference. A list of all the plant species encountered within the Project Study Area is included in this report as Appendix B. This plant species list includes the conservation status of each species as well as an indication of whether the plant is native or introduced.

4.1 Plants of Conservation Concern Survey Methods

Plants that have become rare due to loss of their native prairie habitat have been found to survive in remnants of those habitats. The small white lady's-slipper and western silvery aster have been found in several locations in southern Manitoba close to the City of Winnipeg. Although these plants have not been previously reported within the Project Study Area, pedestrian ground search surveys were conducted to examine the Project Study Area for their possible presence. Pedestrian ground search surveys were conducted along the small, medium, and large trail network present within the Project Study Area (**Section 8**). Further, the grassland meadows, aspen forest, and willow/sedge wetlands were also investigated for the presence of rare and uncommon plant species.

Potential plant species of conservation concern that have potential to occur in prairie and aspen parkland habitats are listed in **Table 3**.

Table 3: Plant Species of Conservation Concern Possibly Present within the Project Study Area

Common Name	Scientific Name	MESA Status	COSEWIC Status	SARA Status
Small White Lady's-slipper	*Cypripedium candidum*	Endangered	Threatened	Endangered
Western Silvery Aster	*Symphyotrichum sericeum*	Threatened	Threatened	Threatened

4.2 Plants Species of Conservation Concern Survey Results

Neither of the plant species of conservation concern (**Table 3**) were identified during the pedestrian ground search surveys. A list of all plant species encountered within the Project Study Area during these surveys is included as **Appendix B**. The list includes the conservation status of each species identified as well as an indication of whether the plant is native or introduced.

4.3 Non-native, Introduced and Invasive Plants Survey Methods

Non-native or introduced floral species are plants that are growing outside of their country or region of origin. Invasive plants are non-native plants that are out-competing or even replacing native plants (Invasive Species Council of Manitoba).

Disturbance caused by human activity introduces and encourages the spread of non-native, invasive plants. The Project Study Area is well used for walking (and dog walking) during all seasons which promotes non-native plant species spread. Further, double-tracked trails exist within the Project Study Area where vehicles have been driven (possibly ATVs, dirt bikes, and/or bicycles) which act as a vector for non-native, invasive plant species spread.

Exposing and compressing bare soils and transporting weed seeds by vehicles, people, and animals all contribute to the spread of non-native, invasive plants. Introduced plant species line the edges of the trails and penetrate into the forest, depending on the width of the trail, which affects the severity of the disturbance. For descriptions of the extensive trail network see Trail Network Classification **Section 8.0**. Vehicle use not only compresses and churns up the soil but also act as conduits for depositing weed seeds into the bare ground allowing weedy and invasive plants to spread. Clovers, dandelions, sow-thistles, and sweetclover are among the weedy species observed within the Project Study Area.

Further to vehicle use and the human trail network, maintenance activities, such as mowing, encourage the growth of non-native grasses and herbs within the Project Study Area. In combination with the mowing activities, the dumping of construction and garden waste has also occurred on the site, which further degrades the quality of the habitat required for native vegetation to thrive.

To assess the presence and scope of non-native and invasive species within the Project Study Area, Pedestrian ground search surveys were conducted along the small, medium, and large trails (**Section 8**) throughout the footprint. Furthermore, the grassland meadows, aspen forest, and willow/sedge wetlands were investigated for the presence of non-native, invasive species. With respect to the trail network, transects were established on the small, medium, and large trails to measure how far from the trail edges invasive species spread. A 3-metre rope marked in 1-metre increments was laid out at a right angle to the trail edge (bare ground or trampled vegetation). Non-native invasive plants were recorded at 1-metre intervals and their densities classified as sparse (1-5 individuals), common (5-10 individuals), or continuous (more than 10 individuals usually forming continuous cover). During each of the ground search surveys, all plant species encountered were recorded and are listed in **Appendix B**.

4.4 Non-native, Introduced and Invasive Plants Survey Results

Plants that are considered to be invasive and were identified as present within the Project Study Area are listed in **Table 4**.

Table 4: Invasive Plants present within the Project Study Area

Common Name	Scientific Name	Listed by ISCM	Listed in White et al. 1993
Purple Loosestrife	Lythrum salicaria	Category 2	Principal Invasive Aliens Wetlands
European Buckthorn	Rhamnus cathartica	Category 2	Principal Invasive Aliens Uplands
White & Yellow Sweetclovers	Melilotus alba, Melilotus officinalis	Not Listed	Moderate Invasive Aliens Uplands
Ox-eye Daisy	Leucanthemum vulgare	Category 2	Not Listed
Reed Canary Grass	Phalaris arundinacea	Not Listed	Principal Invasive Aliens Wetlands
Canada Thistle	Cirsium arvense	Other Terrestrial Invasive Plants	Not Listed
Tartarian Honeysuckle	Lonicera tatarica	Not Listed	Moderate Invasive Aliens Uplands
Perennial Sow -thistle	Sonchus arvensis	Other Terrestrial Invasive Plants	Not Listed
Tufted Vetch	Vicia cracca	Other Terrestrial Invasive Plants	Not Listed

4.4.1 Meadow Grassland

The meadow/grassland area is the smallest of the basic habitat types encountered within the Project Study Area. Small patches occur in open areas in the woodlands; however, the meadow/grasslands are predominately found along the northeast corner of the property. In drier areas, brome and Kentucky blue grass are found with a few native grassland species including prairie cord grass, flat-topped goldenrod, silverweed, and wild licorice. Moister areas support reed grasses, native mints, and Canada goldenrod. Overall, the meadow and grasslands were degraded, with many invasive plant species found.

White sweetclover and tufted vetch form a continuous carpet adjacent to a large trail found through a majority of the area. Canary reed grass has out-competed the native vegetation in one location to form a large patch where few other plants are able to thrive. In openings in the aspen woodland, sweetclovers dominate the vegetation. Sow-thistles are common throughout. Continuous disturbance in these areas was measured beyond 3 metres.

4.4.2 Willow/Sedge Wetland

Wet depressions support tall willows, sedges, and cattails growing in the open water. Basket willows and sandbar willows form thickets surrounded by meadows of woolly sedge and awned sedge. Deeper water supports arctic rush, common and narrow-leaved cattails, and herbs such as mint, germander, and water parsnip. The wetland areas in the southwest portion of the Project Study Area do not seem to be as frequently used by the public. Foxtail barley and sow-thistles

are localized but sparse. The edge of one predominate trail shows incursions of Canada thistle and tufted vetch beyond 3 metres.

Purple loosestrife, a Category 2 (ISCM) and Principal Invasive of Wetlands (White et al.) is very common in the wet meadow areas. Although originally a garden-escape, this plant has become a threat to native vegetation in wetlands through seed spread by birds, its prolific seed production, and the lack of natural controls. The quantification of the distance of spread of the invasive species off the small, medium, and large trail network is provided in **Section 8**.

A small group of swamp milkweed plants was found in one of the willow thickets. Although the plant itself is not rare, milkweeds are a food source for the monarch butterfly, a species of conservation concern (**Section 10**).

4.4.3 Aspen Woodlands

The majority of the native plants present within the Project Study Area are found within the aspen woodlands. Aspen, with few green ash trees present, dominate the low and seasonally wet areas. Understory species include: dogwood, high-bush cranberry, dewberry, Solomon's seal, poison ivy, fringed loosestrife, wild currants, Virginia creeper, Kentucky bluegrass, violets, and asters.

Bur oaks mix in with the aspen in the higher, drier sites. The shrub layer consists of American hazelnut, nannyberry, high-bush cranberry, Saskatoon, and chokecherry. Ground cover consists of: sarsaparilla, violets, gooseberry, wild strawberry, American vetch, poison ivy, Canada mayflower, meadow rue, western snowberry, golden alexander, and Canada anemones.

European buckthorn a Category 2 (ISCM) and Principal Invasive of Uplands (White et al.) was common and spread throughout the aspen woods. Buckthorn produces berries that are eaten by birds that disperse seeds in their droppings. Therefore, buckthorn shrubs produce leaves early in the spring, making them successful at shading out native plants on the forest floor. The quantification of the distance of spread of the invasive species off the small, medium, and large trail network is provided in **Section 8**.

Invasive plants were identified and common within the aspen woodlands. Even off the trail network, buckthorn, sow-thistles, Canada thistle, and sweetclovers were observed. Many non-native "weedy" plants were also present where soil was exposed and the native vegetation had been trampled. These include: dandelions, alfalfa, clovers, plantains, and black medic.

Overall, there were no rare plants or plants of conservation concern found during the plant species Pedestrian ground search surveys.

5 AVIAN SPECIES

Based on the review of provincial and federal bird species at risk listings, there are several bird species of concern that are known to historically occupy the Project Study Area. Bird survey work and habitat assessments were designed to focus specifically on the identification of species at risk and species of special concern within the Project Study Area.

In addition to provincial and federal species at risk legislation, the MBCA of Canada is further environmental legislation developed to ensure the protection of a number of migratory bird species, their eggs, and their nests (MBCA, 1994). In compliance with this Act, no migratory bird species listed under this Act may be captured, injured, taken or disturbed, or nests may be damaged, destroyed, removed, or disturbed (MBCA, 1994). The MBCA does not include many species formally considered as not important or as a pest to humans, e.g., owls, hawks, falcons. These species are protected in Manitoba under the *Manitoba Wildlife Act* (C.C.S.M., c. W130). In order to ensure future development would be in compliance with this legislation, field surveys were designed to specifically investigate for migratory bird presence and possible nesting within the Project Study Area.

5.1 Pedestrian Bird Nest Search Methods

In order to investigate for bird nesting within the Project Study Area, intensive pedestrian ground surveys were conducted on June 14 and 15, 2016. The pedestrian surveys were conducted by four biologists walking side by side along transects spaced 10 m apart covering the entire Project Study Area footprint. Biologists searched for both ground and tree nests, including multi-generational stick nests, active nesting tree cavities, ground nesting activities, and active stick nests and eggs. Biologists recorded all observation of birds, as well as any incidental sightings of wildlife. Based on the habitat assessment conducted prior to field investigations, strategic areas were outlined for bird species at risk, allowing biologists to search areas where bird species at risk habitat assessments identified as quality habitat.

During the pedestrian transect surveys, each member of the field team walked each transect slowly, searching for nesting, eggs, signs of bird activity, and listening for birds. Each member of the field team walked parallel to each other, along the pre-determined transects, ensuring to keep visual contact with each other and allowing for 100% viewing coverage of the survey area. All observations of bird nests/eggs or potential nesting trees (i.e. snags with cavities) were way-pointed. All other observations of wildlife and tracks were recorded.

5.2 Pedestrian Bird Nest Search Results

Four biologists walked pre-determined transects, spaced 10 m apart (**Map 3**) throughout the entire footprint area. There were several bird species that were heard and observed during the pedestrian nest search surveys (**Table 5**). All of the bird species that were heard and/or observed were common species. There were two stick nests that were identified within the Project Study

Area (**Table 6, Map 6**). There were also several observations of cavity nesting trees (**Photo 1**), fallen nesting snags, along with woodpecker activity (**Photo 2**) identified (**Table 6, Map 6**).

Table 5: Bird Species Identified during Pedestrian Bird Surveys

Species	Scientific name	Observation Type	Total Count
Red Winged Blackbird	*Agelaius phoeniceus*	Observation/Vocal	14
Red Eyed Vireo	*Vireo olivaceus*	Observation/Vocal	2
Swamp Sparrow	*Melospiza georgiana*	Vocal	-
Alder Flycatcher	*Empidonax alnorum*	Vocal	-
Willow Flycatcher	*Empidonax traillii*	Vocal	-
Clay Colored Sparrow	*Spizella pallida*	Vocal	-
Marsh Wren	*Cistothorus palustris*	Observation/Vocal	6
Ovenbird	*Seiurus aurocapilla*	Vocal	-
Song Sparrow	*Melospiza melodia*	Vocal	-
White Throated Sparrow	*Zonotrichia albicollis*	Vocal	-
White-breasted Nuthatch	*Sitta carolinensis*	Observation	1
Downy Woodpecker	*Picoides pubescens*	Observation/Vocal	1
Raven	*Corvus corax*	Observation/Vocal	7
Chipping Sparrow	*Spizella passerina*	Vocal	-
Black Capped Chickadee	*Poecile atricapillus*	Observation/Vocal	4

Table 6: Bird Stick Nests Identified during Pedestrian Bird Surveys

Raptor/Cavity Nest Searches	Observed
Cavity Tree	5
Fallen Nesting Snag	2
Large Oak Tree (Cavity)	1
Stick nest (medium size)	2
Woodpecker Activity	4

Photo 1: (Lat 49.849639 Long -97.170197) Example of nesting cavity tree within the Project Study Area, June 14, 2016

Photo 2: (Lat 49.849778 Long -97.170461) Example of woodpecker activity within the Project Study Area, June 14, 2016

5.3 Songbird Point Count Survey Methods

Point Count surveys for birds and amphibians were conducted in conjunction with the pedestrian bird nest searches. The point count is a field method to study avian population trends or response to treatment. Point count surveys offer the opportunity to assess songbird and amphibian presence and their relative habitat use within a defined area by selecting pre-determined locations to listen and observe birds. Habitat descriptions at each survey plot were recorded to facilitate bird/amphibian/habitat association analysis and to confirm quality habitat assessments results conducted prior to field work. Methods for these bird surveys are consistent with breeding bird inventory procedures using a Point Count Method (Ralph et al., 1993; Welsh, 1995). Surveys were conducted within the Project Study Area on June 14 and 15, 2016 by four trained biologists.

Survey sites were selected based on specific habitat features in areas that may be used by bird and amphibian species of conservation concern within the Project Study Area. Surveys were not conducted when winds were greater than 20 km/hr in the area. Universal Transverse Merctator (UTM) coordinates were recorded using handheld GPS units at each survey plot. After a 2 minute calming period, biologists recorded all birds and amphibians heard and all observed within an approximate 75 m radius at each survey plot center during a 10 minute period. Other birds, amphibians, reptiles, and wildlife observed walking or flying overhead or heard in the distance were also recorded as separate observations. Surveys were conducted during the morning, daytime, as well as during the evening. The total numbers and species of birds and amphibians were recorded as well as all other observations of nests, tree cavities, and wildlife signs.

5.4 Songbird Point Count Survey Results

There were three point count locations identified for songbird and amphibians within the Project Study Area. There were several bird species observed and heard during the Point Count Surveys but no amphibians were seen or heard during these three Point Count Surveys. **Tables 7, 8, and 9** present the species of birds that were observed or heard during the three Point Count Surveys. **Map 4** illustrates the locations where the Point Count Surveys were conducted within the Project Study Area.

Table 7: Songbird and Amphibian Point Count Location #1

Species Heard and Observed – Point Count Location # 1	
Red Winged Blackbird	*Agelaius phoeniceus*
Red Eyed Vireo	*Vireo olivaceus*
Ovenbird	*Seiurus aurocapilla*
Song Sparrow	*Melospiza melodia*
White Throated Sparrow	*Zonotrichia albicollis*
Raven	*Corvus corax*
Chipping Sparrow	*Spizella passerina*

Table 8: Songbird and Amphibian Point Count Location #2

Species Heard and Observed – Point Count Location # 2	
Red Winged Blackbird	*Agelaius phoeniceus*
Red Eyed Vireo	*Vireo olivaceus*
Alder Flycatcher	*Empidonax alnorum*
Ovenbird	*Seiurus aurocapilla*

Table 9: Songbird and Amphibian Point Count Location #3

Species Heard and Observed – Point Count Location # 3	
Red Winged Blackbird	*Agelaius phoeniceus*
Marsh Wren	*Cistothorus palustris*
Ovenbird	*Seiurus aurocapilla*
Song Sparrow	*Melospiza melodia*
White Throated Sparrow	*Zonotrichia albicollis*
White-breasted Nuthatch	*Sitta carolinensis*
Chipping Sparrow	*Spizella passerina*
Swamp Sparrow	*Melospiza georgiana*
Clay Colored Sparrow	*Spizella pallida*
Raven	*Corvus corax*
Downy Woodpecker	*Picoides pubescens*

All of the bird species observed and heard are common species. There were no listed bird species that were identified within the Project Study Area during the Songbird Point Count Surveys.

5.5 Water Bird and Waterfowl Survey Methods

Water bird and waterfowl surveys were conducted on June 14 and 15, during periods of little wind on warm, clear mornings. All species of waterfowl observed or heard were recorded as well as all waterfowl species identified in and near wetlands and waterbodies in survey areas throughout the day. The number of individuals by species as well as habitat characterizations were recorded.

5.6 Water Bird and Waterfowl Survey Results

Water bird and waterfowl point count locations, labelled 4, 5 and 6, (**Map 5**) were identified by habitat assessments conducted prior to field work, as suitable locations for Water Bird and Waterfowl Point Count Surveys. Four biologists observed and listened at each of these survey sites for the presence of water birds and waterfowl, during the mornings of June 14 and 15, 2016 (**Map 5**). **Table 10** presents the water bird and waterfowl species that were observed and/or heard during these point count surveys.

Table 10: Results of Water Bird and Waterfowl Point Count Surveys

Point Count Survey - Water Birds	
Point #4	
Red Winged Blackbird	*Agelaius phoeniceus*
Point #5	
Sora Rail	*Porzana carolina*
Point #6	
Mallard	*Anas platyrhynchos*
Marsh Wren	*Cistothorus palustris*

Overall, there were very few water birds and/or waterfowl that were heard or observed during the Water Bird and Waterfowl Point Count Surveys.

5.7 Raptor Nest Search Methods

During the pedestrian bird nest search surveys, specific attention was paid to investigate for raptor nesting at the top of the forest canopy. Adopting the same methods used for the investigation for the multigenerational stick nest, the raptor nest searches were conducted for birds of cultural and ecological significance including eagles (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), and hawks.

5.8 Raptor Nest Search Results

There were no raptor nests that were identified during the raptor nest searches. As noted in Section 5.2, there were several observations of cavity nesting trees, fallen nesting snags, as well as observations of woodpecker activity (**Table 6, Map 6, Photos 1 and 2**).

5.9 Nocturnal Owl Survey Methods

Nocturnal owl surveys were conducted to identify presence of owls and/or other nocturnal birds within the Project Study Area. Nocturnal owl surveys were conducted 30 minutes after sunset. Surveys were conducted at sites strategically identified through habitat characterization completed prior to field investigations. Following an initial one minute calming period at each site, a two-minute listening period followed and all owl or nocturnal bird vocalizations were recorded on hand-held GPS units.

5.10 Nocturnal Owl Survey Results

Nocturnal owl surveys were conducted during the late evenings of June 14 and 15, 2016 (**Map 7**). During both evenings and at both locations, there were no owls and/or nocturnal bird species heard.

6 HERPTILES

6.1 Amphibian Point Count Survey Methods

Point count survey sites for amphibians were selected based on specific habitat features within the Project Study Area that may be used by amphibian species of conservation concern. UTM coordinates were recorded using handheld GPS units at each survey plot. After a 2 minute calming period, biologists recorded all amphibians and birds heard and all species observed at each survey plot center during a 10 minute period. All observations of species were recorded on a hand-held GPS units. Surveys were conducted by 2 biologists during the mornings of June 14 and 15, 2016 (**Map 5**).

6.2 Amphibian Point Count Survey Results

Point count locations, labelled 4, 5 and 6, the same locations used for the Water Bird and Waterfowl Point Count Surveys, (**Map 5**) were identified by habitat assessments conducted prior to field work, as suitable locations for amphibian point count surveys. **Table 11** presents the amphibian species that were observed and/or heard during these point count surveys.

Table 11: Results of Amphibian Point Count Surveys

Point Count Survey - Amphibian	
Point #4	
Chorus Frogs	*Pseudacris triseriata*
Wood Frogs	*Lithobates sylvaticus*
Point #5	
Chorus Frogs	*Pseudacris triseriata*
Wood Frogs	*Lithobates sylvaticus*
Point #6	
Chorus Frogs	*Pseudacris triseriata*

There were no amphibian species at risk (such as the Northern Leopard Frogs) heard or identified during the Amphibian Point Count Surveys.

6.3 Reptile Hibernacula Search Methods

Given the habitat types and the saturation that characterizes the Project Study Area, reptile presence was not anticipated. However, in conjunction with ongoing transect surveys, four biologists investigated for any signs suggesting the presence of reptiles and/or denning within the Project Study Area.

6.4 Reptile Hibernacula Search Results

There were no reptiles or potential hibernacula for reptiles observed during the Pedestrian Transect Surveys within the Project Study Area.

7 MAMMALS

7.1 Mammal Track and Sign Survey Methods

A multispecies ground survey was conducted to identify all terrestrial mammals present in the Project Study Area. Tracks of all species, scat, browse, and direct observations of wildlife were recorded. Pre-determined transects, spaced 10 m apart were followed by four biologists to search for activity such as tracks, scat, browse activity, denning, and/or bedding sites. All observations of wildlife and signs of activity were recorded on a handheld GPS unit and on a detailed data sheets.

7.2 Mammal Track and Sign Survey Results

There were very few signs of mammal activity identified during the multispecies ground survey. Biologists speculate this could be the result of the significant degree of water pooling over a majority of the Project Study Area and/or a result of the heavy use of the Project Study Area by humans and dogs. **Table 12** lists the mammal signs and observations made during the Mammal Track and Sign Survey.

Table 12: Results of the Mammal Track and Sign Surveys within the Project Study Area

Species	Scientific name	Observation Type	Total Count
Field Mouse	*Microtus pennsylvanicus*	Observation	1
Eastern Cotton Tail	*Sylvilagus floridanus*	Observation	1
White-tailed Deer	*Odocoileus virginianus*	Track	1
White-tailed Deer	*Odocoileus virginianus*	Fawn - Mortality	1

7.3 Mammal Denning Transect Survey Methods

In combination with the bird nesting and reptile den search surveys, mammal denning searches were conducted. Using the habitat analysis conducted prior to field work, suitable habitat for small mammal dens and fox dens were identified within the Project Study Area. Pedestrian transects spaced 10 m apart were walked by four biologists to investigate for the presence of mammal denning. Field biologists walked each transect slowly, searching for small mammal (both aquatic and terrestrial species) and fox dens. Each member of the field team walked parallel to each other, along the pre-determined transects, ensuring to keep visual contact with each other and allowing for 100% viewing coverage of the survey area. All observations of wildlife species, dens identified, and potential denning sites were way-pointed. Any other observations of wildlife or tracks were also recorded.

7.4 Mammal Denning Transect Survey Results

There were no small or large mammal dens that were identified during the Mammal Denning Transect Surveys conducted within the Project Study Area.

7.5 Bat Hibernacula Survey Methods

Pre-determined transects, spaced 10 m apart were followed by four biologists to search for bat presence, signs of activity, potential hibernacula, and/or possible bat roosting trees. All observations of wildlife and signs of bat activity were recorded on a handheld GPS unit and on a detailed data sheets.

7.6 Bat Hibernacula Survey Results

There were no signs of bat presence, activity, bat hibernacula, or roosting sites present within the Project Study Area.

8 TRAIL NETWORK CLASSIFICATION

The Project Study Area has been heavily used by humans with a matrix of human and dog walking trails that exist throughout the footprint area. During the Pedestrian Transects Surveys, biologists walked the existing trails, tracking their path on GPS units. Based on the path tracking data that were generated during field work in combination with the publically available trail data that was derived from satellite imagery, the trails within the Project Study Area were digitized and categorized. The trails were categorized into three categories: small trails (width of 0.75 m); medium trails (width of 1.5 m); and large trails (width of 3.0 m). To validate these categorizations of trail width, these trail widths were verified in the field with measurements taken to ensure width representations for each trail category were accurate (**Table 13, Map 8**).

Given the significant degree of human influence along these trails, invasive and weedy species encroachment is favoured, resulting in invasive species and noxious weed expansion along trail edges. The degree of spread of weedy and invasive species associated with each trail category were measured and quantified. The degree of weedy and invasive species encroachment on small trails was determined to be 0.5 m (for a total width of trail plus weedy buffer of 1.25 m); on medium trails was determined to be 1.0 m (for a total width of trail plus weedy buffer of 2.50 m); and on large trails was determined to be 2.0 m (for a total width of trail plus weedy buffer of 5.0 m). Based on these quantifications, the total proportion of the Project Study Area that is comprised of trail network and weedy and invasive species encroachment was calculated (**Table 13, Map 9**).

Table 13: Proportion of Project Study Area comprised of trail network

Trail Size	Length (m)	Trail ROW Area (ha)	Proportion of Study Area (%)	Encroachment Area (ha)	Proportion of Study Area (%)
Small	4,000.96	0.2939	1.53%	0.48	2.52%
Medium	1,587.80	0.2362	1.23%	0.37	2.03%
Large	1,899.43	0.5753	2.99%	0.96	5.02%
Total	7,488.19	1.11	5.78%	1.82	9.47%

Photo 3: (Lat 49.849213 Long -97.173243) Example of a Large Trail within the Project Study Area, June 14, 2016

Further to the walking trails that exist, a portion of the Project Study Area has been mowed by the City of Winnipeg. The City of Winnipeg Neighbourhood Liveability By-Law No. 1/2008 stipulates no properties other than those zoned for agricultural grazing and feeding and agricultural cultivation can maintain vegetation beyond a maximum length of 15 cm (6 inches). Consequently, the City of Winnipeg has mowed a total of 3.68% of the Project Study Area of which all of the grasslands (18.36%), and 1.39% of the wetlands have been mowed. Mowing these grassland and wetland habitat types degrades their overall quality, favouring vegetation species composition changes, as well as presenting an avenue for invasive and noxious weed dispersal from neighbouring mowed lands onto Project Study Area lands. **Table 14** provides the amount of habitat that is lost due to the trail network, weedy and invasive species encroachment as well as the mowed lands.

Table 14: Amount of Habitat Loss due to Trail Network, Weedy/Invasive Species Encroachment, and Mowing

Habitat Type	Area (ha)	Trail ROW Area (ha)	Proportion of Study Area (%)	Encroachment Area (ha)	Proportion of Study Area (%)	Habitat Lost due to Trail Network and Mowing (ha)	Proportion of Habitat Lost due to Trail Network and Mowing (%)
Aspen	10.39	0.61	5.92%	1.02	9.85%	1.02	9.85%
Grassland	3.44	0.31	9.07%	0.55	15.97%	1.09	31.77%
Wetland	5.40	0.18	3.41%	0.24	4.52%	0.32	5.88%
Total Area	19.22	1.11	5.78%	1.82	9.47%	2.43	12.66%

Based on these data **Table 15** presents the linear density of trails within the Project Study Area. The total linear density of the man-made trails totals 389.51 m/ha of the total Project Study Area footprint. Therefore, in each hectare, there is 389.51 linear meters of trail.

Table 15: Linear Density of Trail Network within the Project Study Area

Classified Trails	Length (M)	Study Area	Linear Density (m/ha)
Small	4,000.96	19.22	208.12
Medium	1,587.80	19.22	82.59
Large	1,899.43	19.22	98.80
Total	7,488.19	19.22	389.51

9 HUMAN IMPACT

In addition to the trail network that exists throughout the Project Study Area, the property appears to be a pooling site for water runoff from neighbouring properties as there is a substantial amount of standing water over a majority of the footprint. Given the magnitude of standing water, the overall habitat quality for a variety of species is diminished. Further, a considerable amount of garbage, debris, and squatter activity was identified during the Biophysical Field Surveys (**Map 10**). Over and above a significant amount of garbage strewn throughout the site, there were larger deposits of debris, such as: old car parts, concrete foundational footings, concrete blocks, and old gas barrels (**Photos 4 and 5**). In one location, a number of marijuana plants (n=6) were identified (**Map 11**) and reported to the City of Winnipeg Police Service. Further, a number of larger squatter sites were identified (**Photos 6 and 7**). These sites were characterized by a substantial amount of household items (i.e. mattresses, chairs, old couches, and old appliances) along with a variety of other items that covered a significant footprint area (+5 m^2). Some of these sites had tents set up as well as attempts to create wood structures for shelter. In most instances, however, the degree of water saturation that characterized a majority of the Project Study Area appeared to have overtaken these squatter sites, likely making them unfit for inhabitants. **Map 12** presents the trail network in combination with the garbage, debris, and squatter sites overlain. The total footprint area comprised of habitat lost due to the trail network, mowing, garbage and squatter is 2.65 ha (13.77%) of the total footprint area.

Photo 4: (Lat 49.849258 Long -97.171175) Example of debris dumped in the Project Study Area, June 15, 2016

Photo 5: (Lat 49.850861 Long -97.165691) Example of debris dumped in the Project Study Area, June 15, 2016

Photo 6: (Lat 49.849627 Long -97.172315) Examples of squatter sites located within the Project Study Area, June 15, 2016

Photo 7: (Lat 49.850220 Long -97.167414) Examples of squatter sites located within the Project Study Area, June 15, 2016

10 WETLAND CLASSIFICATION

10.1 Wetland Classification Methods

The wetland assessment was conducted using the Stewart and Kantrud (1971) system of wetland classification. This classification system is the system currently applied by the Province of Manitoba for environmental approvals, and was developed for use in prairie ecosystems. The Stewart and Kantrud (1971) system classifies wetland areas into seven different types of zones. These zones are described as follows:

1. Class I- Ephemeral Wetlands typically have free surface water for only a short period of time after snowmelt or storm events in early spring. Because of the porous condition of the soils, the rate of water seepage from ephemeral wetlands is very rapid after thawing of the underlying frost seal. These areas may be periodically covered by standing or slow moving water. Water is retained long enough to establish some wetland or aquatic processes. These areas are typically dominated by Kentucky bluegrass, goldenrod and other wetland or low prairie species.

2. Class II - Temporary Wetlands are periodically covered by standing or slow moving water. These areas typically have open water for only a few weeks after snowmelt or several days after heavy storm events. Water seepage is fairly rapid, but surface water usually lingers for a few weeks after spring snowmelt and for several days after heavy rainstorms at other times of the year. Water is retained long enough to establish wetland or aquatic processes. These areas are dominated by wet meadow vegetation such as fine-stemmed grasses, sedges and associated forbs.

3. Class Ill - Seasonal Ponds and Lakes are characterized by shallow marsh vegetation, which generally occurs in the deepest zone (usually dry by midsummer). These types of wetlands are typically dominated by emergent wetland grasses, sedges and rushes.

4. Class IV · Semi-permanent Ponds and Lakes are characterized by marsh vegetation, which dominates the central zone of the wetland, as well as coarse emergent plants or submerged aquatics, including cattails, bulrushes and pondweeds. These types of wetlands frequently maintain surface water throughout the growing season, i.e., from May to September.

5. Class V - Permanent Ponds and Lakes have permanent open water in a central zone that is generally devoid of vegetation. Submerged plants may be present in the deepest zone, while emergent plants are found along the edges. Plants commonly present in these types of wetlands include cattails, red swampfire and spiral ditchgrass.

6. Class VI Alkali Ponds and Lakes are wetlands where deep water is typically not permanently present. Alkali wetlands are characterized by a pH above 7 and a high concentration of salts. The dominant plants are generally salt tolerant and include red swampfire and spiral ditchgrass. These types of wetlands are especially attractive for shore birds.

7. Class VII Fen Ponds are wetlands in which fen vegetation dominates the deepest portion of the wetland area. This wetland type often has wet meadow and low prairie vegetation present on the periphery. The soils are normally saturated by alkaline groundwater seepage. Fen ponds often have quaking or floating mats of emergent vegetation, which includes sedges, grasses and other herbaceous plants.

The wetland assessment was conducted on foot within the Project Study Area on June 15, 2016. The type, location and condition of vegetation, ground cover, surface soils, and surface water were assessed by walking the perimeter of the property; walking into areas where potential wetland vegetation would be present; and walking along the numerous existing trails located within the property (**Map 8**). The type, location, and condition of vegetation, ground cover, surface soils, and surface water were documented using a handheld GPS unit, geo-referenced photographs and notes.

10.2 Wetland Classification Results

The wetland assessment found that the vegetation located within the property consists of a mix of areas of upland vegetation, areas of wet meadow vegetation, and areas of wetland plants that would be classified as Class I, Class II, Class III or possibly Class IV (due to the presence of cattails) wetland areas under the Stewart and Kantrud system. The walking trails found throughout the property consisted of mud and clay, and the majority of these trails were wet or inundated with water ranging from a depth of 0 to 15 centimetres (cm) in all areas of the property (i.e., in the areas of upland, wet meadow, and wetland vegetation types). **Map 2** illustrates the habitat types within the Project Study Area and shows the areas defined as aspen, grassland or wetland. A description of the vegetation found within each of these defined areas is provided in Section 4. Appendix B to this report provides a list of the plant species by common name and scientific name.

The majority of the areas designated as wetlands on **Map 2** consisted of wet meadow vegetation such as grasses (Poaceae), sedges (e.g., *Carex* spp.) and willows (*Salix* spp.). These areas would be considered to be Class II wetlands under the Stewart and Kantrud system of wetland classification. **Photos 8 and 9** provide examples of the vegetation in these areas.

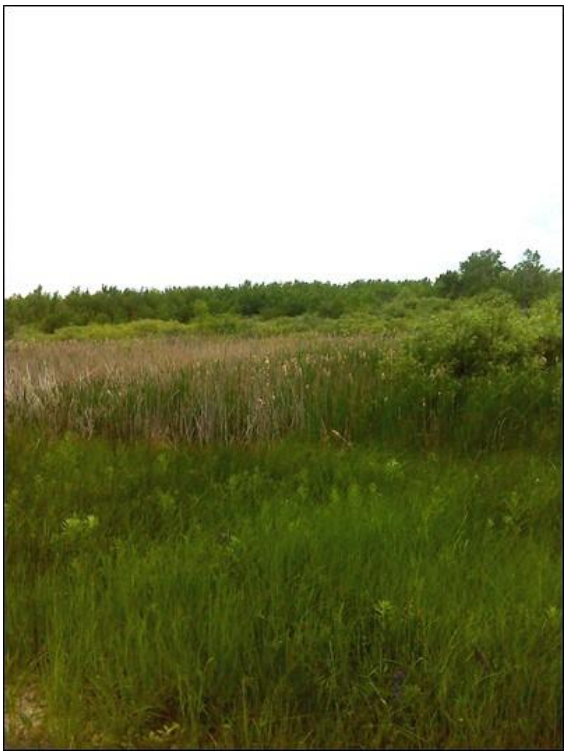
Photo 8: View facing southeast of an area of grasses, sedges and willows located on the northwest side of the property, June 15, 2016

Photo 9: View facing southeast of an area of grasses, sedges and willows located on the southeast side of the property, June 15, 2016

There were also patches of vegetation consisting of Kentucky bluegrass (*Poa pratensis*), goldenrod (*Solidago* spp.), vetches (*Vicia* spp.) and other grasses and forbs along the periphery of some of the areas shown as wetlands in **Map 2**, as well as in some areas shown as “aspen” or “grassland” in **Map 2**. These areas would be considered to be Class I wetlands under the Stewart and Kantrud system of wetland classification. **Photos 10 and 11** provide examples of the vegetation in these areas.

Photo 10: View facing east of an area of grasses and forbs located on the north side of the property, June 15, 2016

Photo 11: View facing south of an area of grasses and forbs (with cattails and willows in the background) located on the northeast side of the property, June 15, 2016



There were a number of patches of cattails (*Typha* spp.) ranging from about 1 m^2 to 10 m^2 in the area in the zones shown as “wetland” in Map 2. The majority of these areas were very wet at the time of the survey, with surface water ranging from 0 to 15 cm in depth. These areas of cattails would be considered to be Class III or Class IV wetlands under the Stewart and Kantrud system of wetland classification; however, it should be noted that cattails are a common native emergent aquatic plant species that will grow in most areas that can provide moist soils or shallow surface water for part of the year (Porter, 2000). Cattails are a common plant in roadside ditches and other disturbed wet areas that can outcompete other native wetland vegetation to form dense monocultures, which can restrict the growth and diversity of other wetland vegetation, and reduce the overall habitat value of wetland areas (Czarapata, 2005). As such, the presence of cattails in an area is not necessarily an indicator of the presence of a Class IV wetland. **Photos 12 and 13** provide examples of the cattail patches found within the wetland areas shown in **Map 2**.

Photo 12: View facing southeast of an area of cattails (background) in the middle area of the property, June 15, 2016.

Photo 13: View facing south of an area of cattails (background) in the northeast section of the property, June 15, 2016

Note: Patches of cattails were found along the western edge of the property, the middle section of the property, and the eastern side of the property

As noted in Section 9, the properties surrounding the Project Study Area appear to be graded in a manner that causes much of the overland and subsurface drainage in the area to be directed, captured and retained within the Project Study Area. There were several areas designated as “aspen” or “grassland” on **Map 2** that contained saturated soils and/or surface water (**Photo 14**). There were a number of significant rainfall events in the spring of 2016 and it is expected that the saturated soils and surface water are a result of the combined effect of the heavy precipitation, soil types (mud and clay soils, which will retain or occlude water, vs. sand or gravel soils, though which water will drain) and low-lying topography of the Project Study Area. Surveys conducted by M. Forster Enterprises in the fall of 2013 and spring of 2015 in areas adjacent to the Project Study Area found that the ground surface was not saturated and there were no areas of surface water. There were also patches of cattails found during the 2013 and 2015 surveys; however, the ground surface was dry with no standing water at the time of those surveys.

Photo 14: View facing north of a pathway in an area designated as “aspen” in the western section of the property, June 15, 2016

A number of patches of swamp milkweed (*Asclepias incarnata*) were also observed to be present in the middle and north areas of the property (**Photo 15**). These plants provide critical habitat and food for Monarch butterflies (*Danaus plexippus*), which are a species of Special Concern under Schedule 1 of the Canadian federal *Species At Risk Act* (SARA). These plants should be preserved or replaced wherever possible, in accordance with the proposed Environment Canada Species at Risk Act Management Plan for the Monarch (Environment Canada 2014).

Photo 15: View of patch of swamp milkweed located in the middle section of the property, June 15, 2016

11 SUMMARY

The proposed development of the Gem Equities-owned lands located within the Parker Lands Major Re-Development Site does not fall under the Provincial Classes of Development. The development of the lands owned by Gem Equities in association with the Parker Major Re-Development Site does not require approval under the *Manitoba Environment Act* or CEAA, and does not require an Environment Act License to proceed with development.

Extensive field surveys conducted within the Project Study Area identified no listed species of mammals, birds, herptiles, or plants. The Project Study Area appears to be the drainage basin for neighbouring properties with a majority of the property footprint being saturated substantially with high water levels diminishing the quality of the habitat for a variety of species. Very little mammal activity was identified and the bird species seen and heard were common species. There were two medium-sized stick nests identified and several potential cavity nesting trees and snags.

The Project Study Area supports meadows, sedge/willow wet areas, and aspen woodlands. The vegetation surveys conducted in June and July 2016 identified 115 vascular plant species in the area. Of those, ten species are considered invasive with an additional 16 species considered to be non-native plants.

Purple loosestrife and European buckthorn were both found to be common in the willow/sedge wet areas and the aspen woodlands within the Project Study Area. Both these invasive plant species are listed as Category 2 (ISCM) and as Principal Invasive Aliens. Both of these species produce many seeds that are dispersed by birds and animals. These invasive plants could be detrimental to adjacent green spaces within the city as avian and terrestrial wildlife could spread these invasive seeds into other City greenspace areas.

A number of patches of swamp milkweed (*Asclepias incarnata*) were observed in the middle and north areas of the Project Study Area. These plants provide critical habitat and food for Monarch butterflies (*Danaus plexippus*) and should be preserved or replaced wherever possible, in accordance with the proposed Environment Canada Species at Risk Act Management Plan for the Monarch (Environment Canada 2014).

The Project Study Area represents a fragmented remnant habitat patch, subjected to significant human pressures, characterized by substantial edge effect and surrounded by residential and commercial development. Within the Project Study Area, there is an extensive trail network with each trail buffered by the spread of weedy and invasive species. Additionally, a considerable amount of garbage and debris were identified during the biophysical survey work, including a number of sizable squatter sites. The trail network, weedy and invasive species encroachment, garbage, debris, and squatter sites all diminish the quality of the habitat within the Project Study Area.

A formal classification of the wetland areas within the Project Study Area determined the wetland to be a mix of Class I, II, and III's with one potential Class IV wetland; however, all of the wetland areas were degraded by garbage dumping and woody species encroachment.

12 WORKS CITED

Czarapata, E. 2005. Invasive Plants of the Upper Midwest: An Illustrated Guide to Their Identification and Control. University of Wisconsin Press. July, 2005.

EcoLogic, 2016. GEM Equities Oak Grove Development Project: Environmental Background Report, May 2016.

Environment Canada. 2014. Management Plan for the Monarch (*Danaus plexippus*) in Canada [Proposed]. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iv + 39 pp.

European Buckthorn invasive species site: www.dnr.state.mn.us: http://www.dnr.state.mn.us/invasives/terrestrialplants/woody/buckthorn/index.html accessed July14, 2106.

Invasive Species Council of Manitoba (ISCM): http://www.invasivespeciesmanitoba.com/site/ accessed July 9, 2016.

Porter, M. 2000. Cattails – Habitat or Hassle? Ag News and Views, June 2000. The Noble Foundation, Ardmore, Oklahoma. Available at: https://www.noble.org/ag/wildlife/cattails/. Accessed July 07, 2016.

Purple Loosestrife Manitoba: http://purpleloosestrife.org accessed July 14, 2016.

Ralph, J.C., G.R. Geupel, P. Pyle, T.E. Martin, D.F. DeSante. 1993. Handbook of field methods for monitoring landbirds. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, Department of Agriculture, 41p.

Smith R.E., H. Veldhuis, G.F. Mills, R.G. Eilers, W.R. Fraser, and G.W. Lelyk. 1998. Terrestrial Ecozones, Ecoregions, and Ecodistricts of Manitoba, An Ecological Stratification of Manitoba's Natural Landscapes. Technical Bulletin 1998-9E. Land Resource Unit, Brandon Research Centre, Research Branch, Agriculture and Agri-Food Canada. Winnipeg, Manitoba.

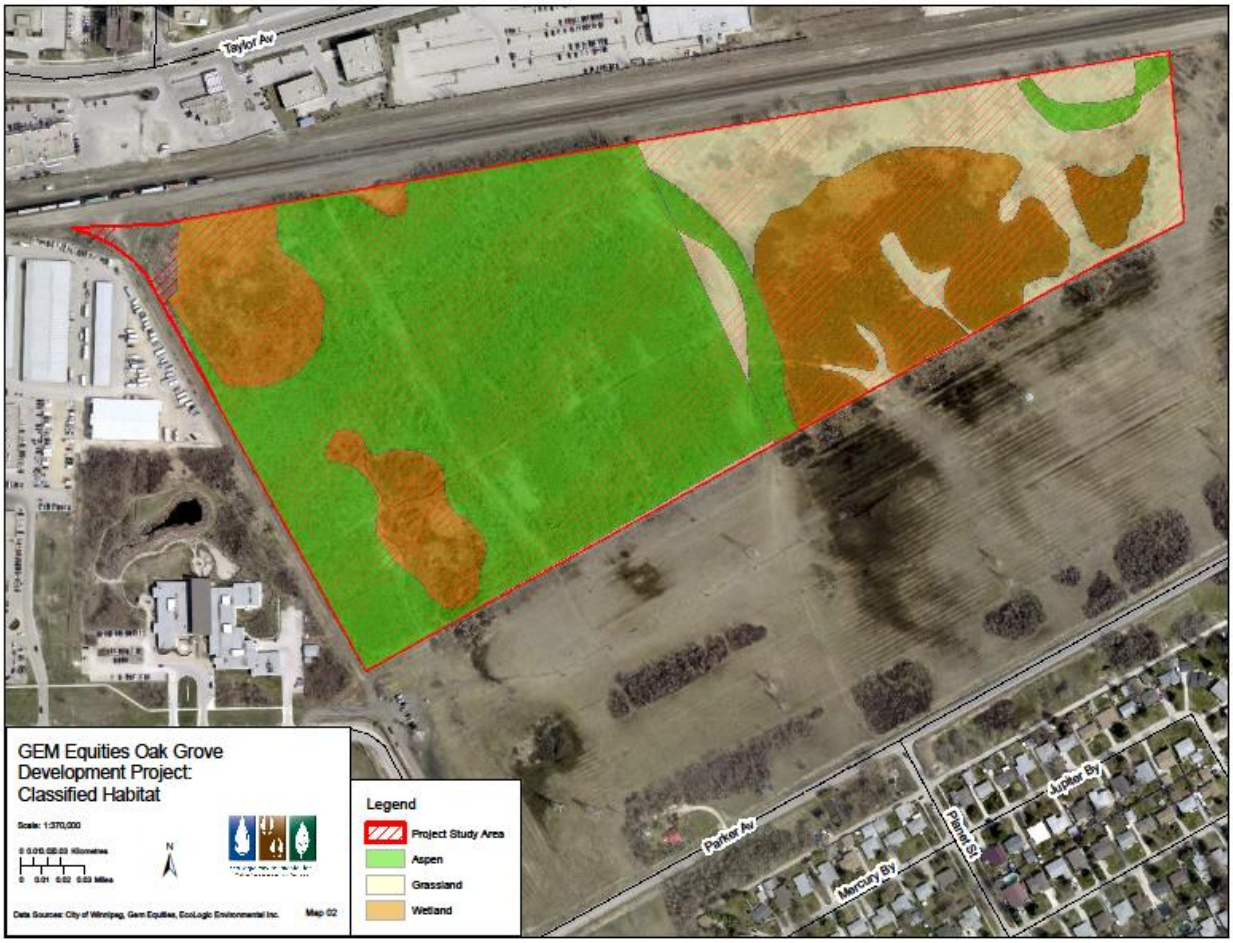
Stewart, R.E. and H.A. Kantrud. 1971. Classification of Natural Ponds and Lakes in the Glaciated Prairie Region. Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Washington, D.C., USA. Resource Publication 92. 57 pp.

Welsh, D.A. 1995. An Overview of the Forest Bird Monitoring Program in Ontario, Canada. USDA Forest Service Gen. Tech. Rep. PSW-GTR-149. 93-97.

White D.J., E. Haber, and C. Keddy. 1993. Invasive plants of natural habitats in Canada: an integrated review of wetland and upland species and legislation governing their control.

Appendix A: Report Maps

Map 1: Project Study Area



Map 2: Habitat Types within the Project Study Area

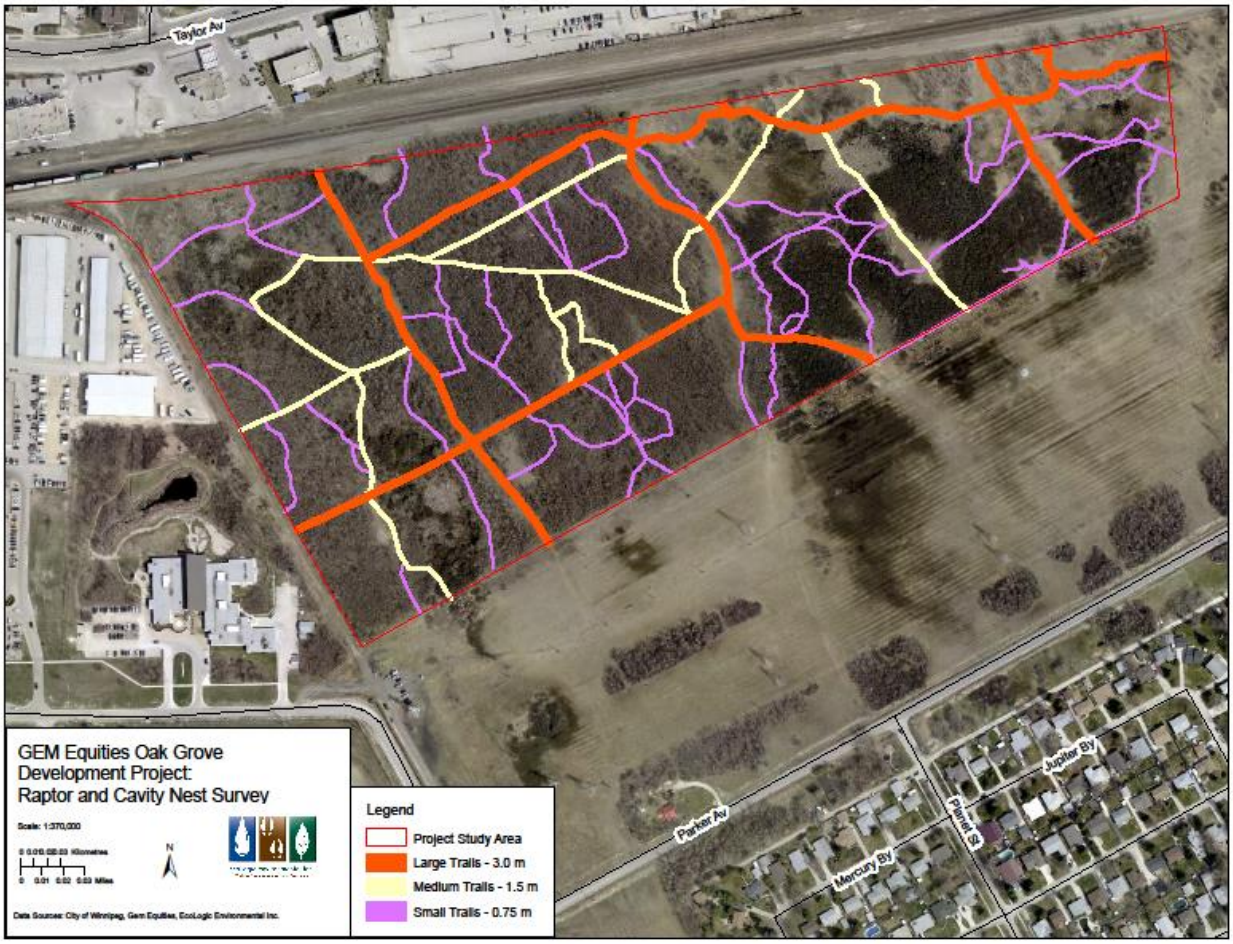
Map 3: Pre-Determined Transects Spaced 10m apart throughout the Project Study Area

Map 4: Song Bird Point Count Locations within the Project Study Area

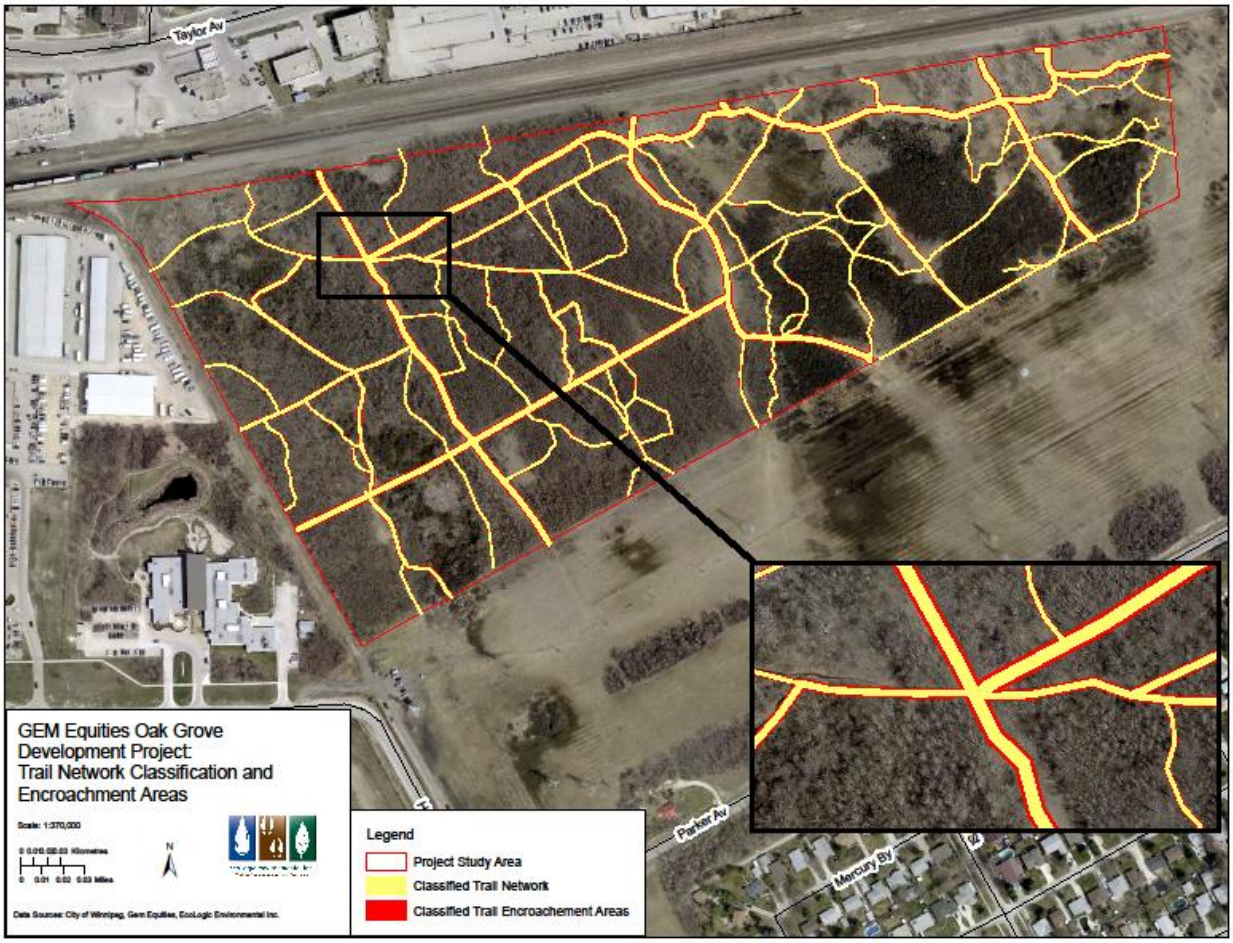
Map 5: Water Bird Point Count Locations within the Project Study Area

Map 6: Raptor and Cavity Nest Search Results within the Project Study Area

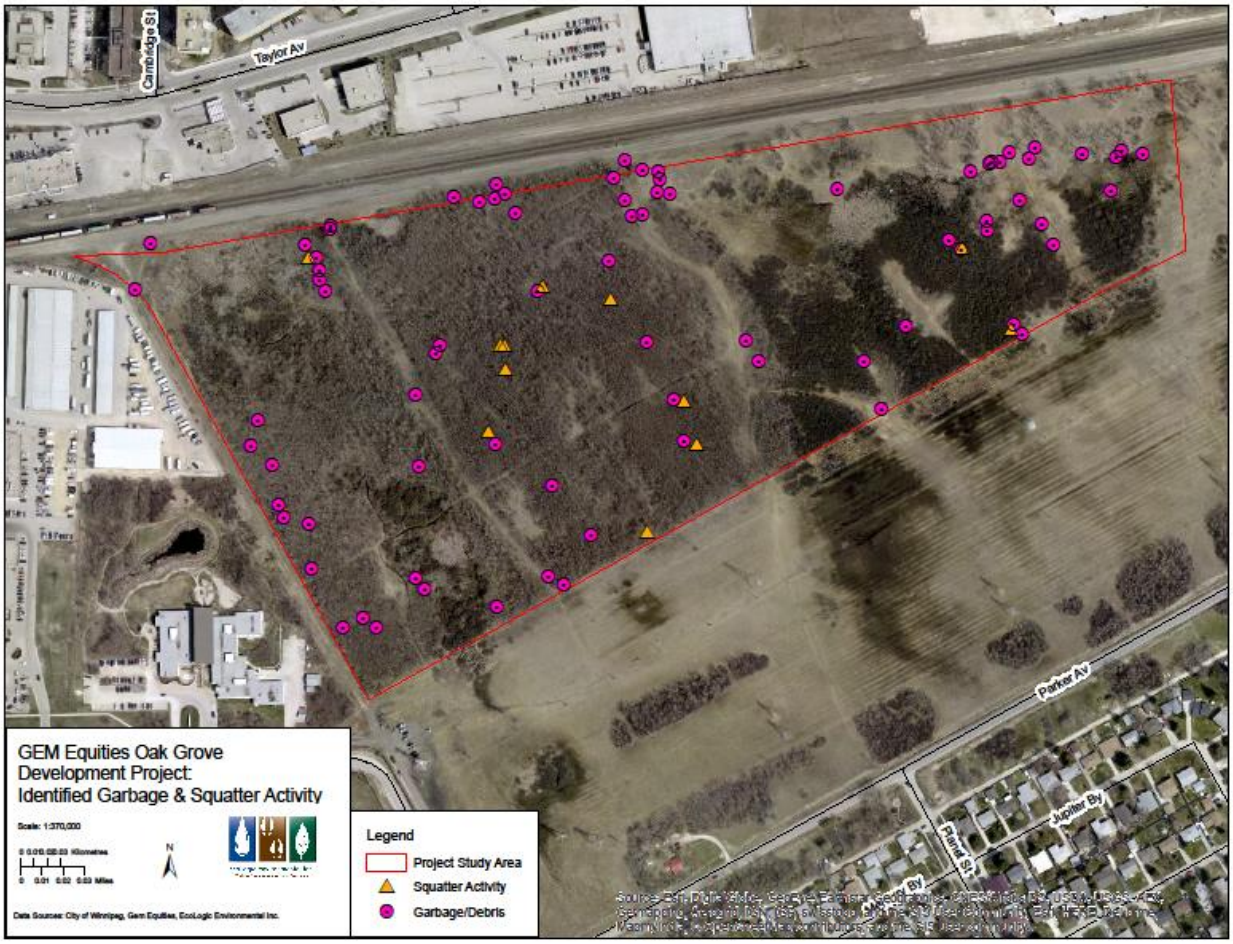
Map 7: Nocturnal Owl Survey Locations within the Project Study Area



Map 8: Trail Network Classification within the Project Study Area

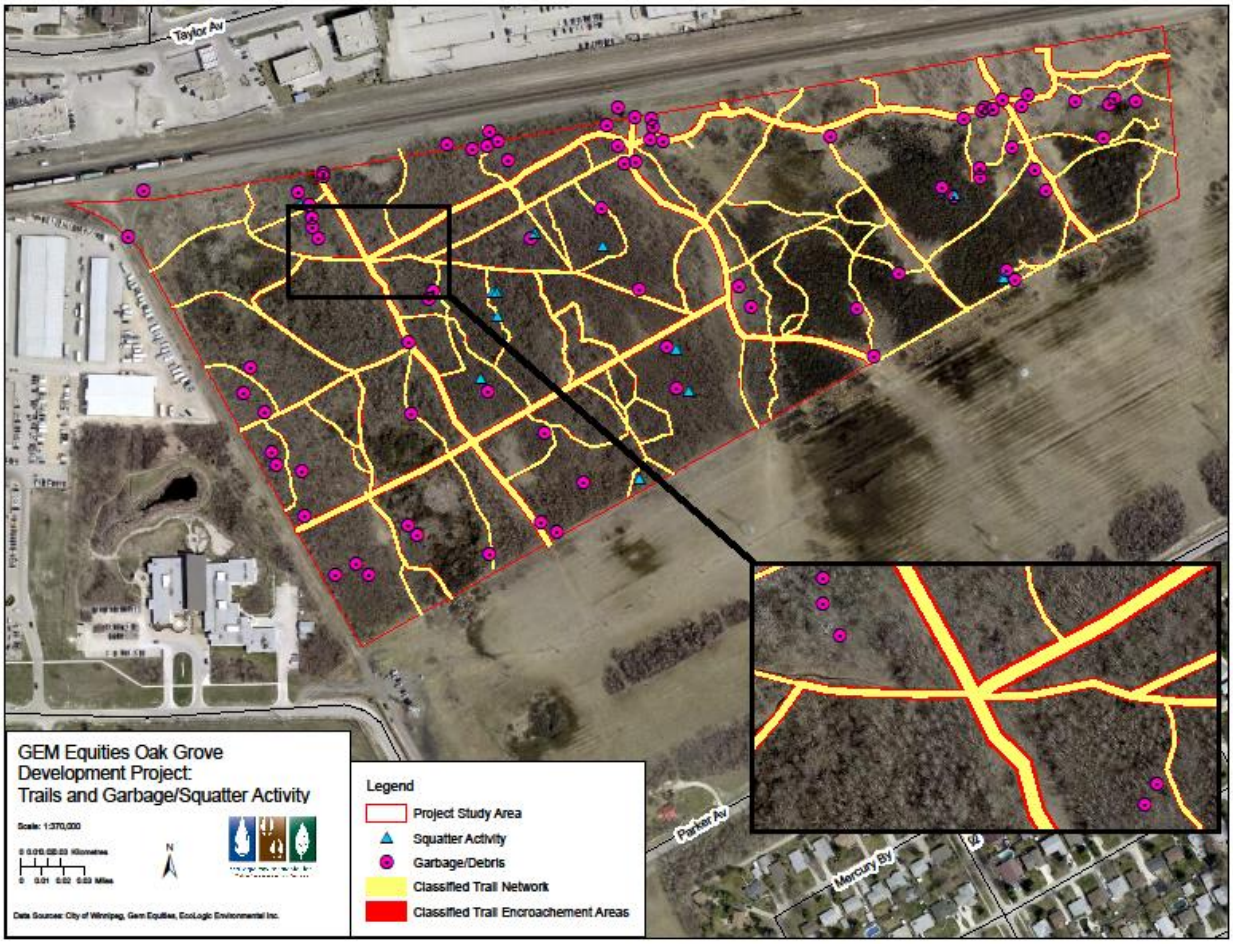


Map 9: Trail Network with Weedy and Invasive Species Encroachment



Map 10: Garbage, Debris, and Squatter Activity Locations within the Project Study Area

Map 11: Marijuana Plants (n=6) Located within the Project Study Area



Map 12: Trail Network with Weedy and Invasive Species Encroachment including locations of Debris, Garbage, and Squatter Activity

Appendix B: Plant Species Identified within Project Study Area

SPECIES NAME	COMMON NAME	ORIGINS	PROV RANK
Acer negundo	Manitoba Maple	Native	S5
Achillea millefolium	Yarrow	Native	S5
Agoseris glauca	False Dandelion	Native	S5
Agrostis stolonifera	Creeping Bent	Introduced	SNA
Ambrosia psilostachya	Perennial Ragweed	Native	S5
Amelanchier alnifolia	Saskatoon	Native	S5
Anemone canadensis	Canada Anemone	Native	S5
Anemone virginiana	Virginia Anemone	Native	S4
Antennaria spp.	Pussytoes	Native	
Aralia nudicaulis	Wild Sarsaparilla	Native	S5
Argentina anserina	Silver Weed	Native	S5
Armoracia rusticana	Horseradish	Introduced	SNA
Asclepias incarnata	Swamp Milkweed	Native	S4
Asparagus officinalis	Garden asparagus	Introduced	SNA
Astragalus agrestis	Purple Milk-vetch	Native	S5
Bidens vulgata	Beggarticks	Native	S4
Bromus inermis	Smooth Brome	Introduced	SNA
Carex atherodes	Awned Sedge	Native	S5
Carex aurea	Golden Sedge	Native	S5
Carex pellita	Wooly Sedge	Native	S5
Carex tenera	Slender Sedge	Native	S4
Cirsium arvense	Canada Thistle	Invasive	SNA
Comandra umbellata	Bastard Toadflax	Native	S5
Cornus sericea	Red-osier Dogwood	Native	S5
Corylus americana	American Hazelnut	Native	S4
Elaeagnus angustifolia	Russian Olive	Introduced	SNA
Eleocharis sp.	Spike Rush	Native	
Erigeron philadelphicus	Philadelphia Fleabane	Native	S5
Fragaria virginiana	Smooth Wild Strawberry	Native	S5
Fraxinus pennsylvanica	Green Ash	Native	S5
Galium boreale	Northern Bedstraw	Native	S5

Geum aleppicum	Yellow Avens	Native	S5
Glaux maritima	Sea-milkwort	Native	S4S5
Glyceria grandis	Tall Manna Grass	Native	S5
Glycyrrhiza lepidota	Wild Licorice	Native	S5
Heliopsis helianthoides	False Sunflower	Native	S5
Hemerocallis sp.	Daylilly	Introduced	
Juncus arcticus	Arctic Rush	Native	S5
Juncus tenuis	Path Rush	Native	S5
Lathyrus ochroleucus	Cream-coloured Vetchling	Native	S4S5
Leucanthemum vulgare	Oxeye Daisy	Invasive	SNA
Lonicera dioica	Twining Honeysuckle	Native	S5
Lonicera tatarica	Tartarian Honeysuckle	Invasive	SNA
Lotus corniculatus	Bird's-foot Trefoil	Introduced	SNA
Lysimachia ciliata	Fringed Loosestrife	Native	S5
Lysimachia thyrsifolia	Tufted Loosestrife	Native	S5
Lythrum salicaria	Purple Loosestrife	Invasive	SNA
Maianthemum canadense	Canada May Flower	Native	S5
Maianthemum stellatum	Solomon’s Seal	Native	S5
Medicago lupulina	Black Medic	Introduced	SNA
Medicago sativa	Alfalfa	Introduced	SNA
Melilotus alba	White Sweetclover	Invasive	SNA
Melilotus officinalis	Yellow Sweetclover	Invasive	SNA
Mentha arvensis	Common Mint	Native	S5
Moerhingia lateriflora	Grove Sandwort	Native	S5
Packera paupercula	Balsam Groundsel	Native	S5
Parthenocissus quinquefolia	Virginia Creeper	Native	S4
Petasites saggitatus	Arrow-leaved Coltsfoot	Native	S5
Phalaris arundinacea	Reed Canarygrass	Invasive	S5
Phleum pratense	Timothy	Introduced	SNA
Picea glauca	White Spruce	Native	S5
Plantago major	Common Plantain	Introduced	SNA
Poa palustris	Fowl Bluegrass	Native	S5

Poa pratensis	Kentucky Bluegrass	Native	S5
Polygonum amphibium	Smartweed	Native	S5
Populus deltoides	Cottonwood	Native	S4
Populus tremuloides	Trembling Aspen	Native	S5
Prunus virginiana	Chokecherry	Native	S5
Quercus macrocarpa	Bur Oak	Native	S5
Ranunculus cymbalaria	Seaside Crowfoot	Native	S5
Ranunculus pensylvanicus	Bristly Crowfoot	Native	S5
Rhamnus cathartica	Buckthorn	Invasive	SNA
Ribes americanum	Wild Black Currant	Native	S5
Ribes oxyacanthoides	Northern Gooseberry	Native	S5
Ribes triste	Swamp Red Currant	Native	S5
Rosa acicularis	Prickly Rose	Native	S5
Rosa woodsii	Wood’s Rose	Native	S4
Rubus pubescens	Trailing Dewberry	Native	S5
Rumex aquaticus	Western Dock	Native	S5
Rumex crispus	Curly Dock	Introduced	SNA
Sagittaria latifolia	Broad-leaved Arrowhead	Native	S4S5
Salix amygdaloides	Peach-leaved Willow	Native	S4
Salix bebbiana	Bebb's Willow	Native	S5
Salix exigua	Sandbar Willow	Native	S5
Salix petiolaris	Basket Willow	Native	S4
Sanicula marilandica	Seneca Snakeroot	Native	S5
Sium suave	Water Parsnip	Native	S5
Smilax lasioneura	Carrion Flower	Native	S4
Solidago canadensis	Canada Goldenrod	Native	S5
Sonchus arvensis	Field Sow-thistle	Invasive	SNA
Spartina gracilis	Alkali Cordgrass	Native	S4
Spartina pectinata	Prairie Cordgrass	Native	S5
Spiraea alba	Meadowsweet	Native	S5
Stachys palustris	Marsh Hedge-nettle	Native	S5
Symphoricarpos occidentalis	Western Snowberry	Native	S5

Symphyotrichum ciliolatum	Lindley's Aster	Native	S5
Symphyotrichum lanceolatum	Panicled Aster	Native	S5
Taraxacum officinale	Common Dandelion	Introduced	SNA
Teucrium canadense	American Germander	Native	S3S4
Thalictrum dasycarpum	Hairy Meadowrue	Native	S5
Thalictrum venulosum	Veiny Meadowrue	Native	S5
Toxicodendron rydbergii	Poison Ivy	Native	S5
Trifolium hybridum	Hybrid Clover	Introduced	SNA
Trifolium pratense	Red Clover	Introduced	SNA
Trifolium repens	White Clover	Introduced	SNA
Triglochin maritima	Sea-side Arrow Grass	Native	S5
Typha angustifolia	Narrow-leaved Cat-tail	Native	S4
Viburnum lentago	Nannyberry	Native	S4
Viburnum opulus	High-bush Cranberry	Native	S5
Viburnum rafinesquianum	Downy Arrowwood	Native	S4
Vicia americana	American Vetch	Native	S5
Vicia cracca	Tufted Vetch	Invasive	SNA
Viola canadensis	Canada Violet	Native	S5
Viola pubescens	Downy Yellow Violet	Native	S4
Zizia aurea	Golden Alexanders	Native	S5