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Bloor West Avenue Natural Heritage Impact Study: Addendum #1

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High Park Apartment Neighbourhood Natural Heritage Impact Study

1. Introduction

This addendum has been prepared as one way to address cumulative impacts by ensuring that potential impacts and mitigation related to future development in the High Park Apartment Neighbourhood are considered collectively rather than site by site. The High Park Apartment Neighbourhood is not located within the City's natural heritage system however, due to its proximity to High Park, including the High Park Oak Woodland Area of Natural and Scientific Interest (ANSI) and the High Park Environmentally Sensitive Area (ESA), this Natural Heritage Impact Study (NHIS) has been completed to address potential impacts on the natural features and functions and the requirements of the Provincial Policy Statement (MMAH 2014), with guidance of the Natural Heritage Reference Manual (MNRF 2010) and the City of Toronto Official Plan (2015a).

The key findings of this NHIS are as follows:

1. There are no natural heritage features within the HPAN area however significant natural heritage features and functions exist in proximity to this neighbourhood;
2. The HPAN study area has been heavily altered from its historic condition by urbanization, infill, and long term human use, but components such as the urban forest and hydrological inputs have some connections to the ecological features and functions of High Park;
3. Direct impacts are limited and can be mitigated
4. Ecological enhancement opportunities, which will be detailed further in a Biodiverse Landscape Manual for the High Park Area, can increase the ecological features and functions of the HPAN study area;
5. Mitigation of indirect impacts on offsite features due to potential increase in usership is complex and requires coordinated management, policy enforcement and cooperation affecting many parties; and
6. Through implementation of the recommendations related to water quality and quantity, soils and trees, existing conditions in the HPAN can be improved to the benefit of the natural heritage features and functions of High Park.

1.1 Background

D&A was originally retained in August 2017 to undertake a NHIS as a component of the Bloor West Village Avenue (BWVA) Study, conducted by DTAH. The NHIS was initiated as a result of public consultation which indicated a concern for impacts to natural heritage due to intensification in and adjacent to the BWVA Study area. The goal of the BWVA Study NHIS was to characterize the ecological features and functions of the corridor and its surrounding context, and to addresses potential impacts to significant features and ecological functions which may occur as a result of proposed intensification.

The High Park Apartment Neighbourhood (HPAN) abuts the Bloor Street West Avenue Study area immediately north of High Park, and was included as a secondary study area in the Bloor Street West Avenue Study NHIS (2018). This report is an addendum to the BWVA Study NHIS. It focuses on the unique characteristics of the HPAN study area and is intended to build on the findings of, and should be read in conjunction with, the main report.

Detailed information on the ecological characterization of the context of the BWVA and HPAN study areas, including High Park and the Humber River Valley, are summarized in the BWVA NHIS. In addition, environmental policies and guidance documents which apply to the study area are also described in detail in the BWVA NHIS, with only the site-specific implications of these policies detailed herein. Wherever information from the BWVA report is used, section references are provided *in italics*.

1.2 Study Purpose

The purpose of this study is to identify potential impacts on the natural features and functions and to fulfill the NHIS requirement of the Official Plan, the Natural Heritage Reference Manual and the Provincial Policy Statement for development applications adjacent to the High Park Oak Woodland ANSI, and the High Park Environmentally Significant Area with specific focus on the HPAN. This study will:

- Build upon the Bloor West Village Avenue Study NHIS, which includes the HPAN as a secondary study area, in order to address any unique features of the HPAN;
- Identify and evaluate the potential impacts of future development within the HPAN Area on natural heritage features and functions;
- Identify ways to avoid or, if avoidance is not possible, to mitigate any potential impacts from development on natural heritage features and functions; and
- Provide recommendations on ecological enhancement techniques that are appropriate for the HPAN study area.

This report also identifies any detailed environmental studies that may be required as part of future development applications in the HPAN Study Area.

1.3 Study Area

The HPAN study area is located north of High Park at the eastern end of the BWVA study area, bounded by Keele Street (to the east), Gothic Avenue (west), Glenlake Avenue (north), and the approximate Bloor Danforth Subway corridor (south). The study area is approximately 19.6 ha in size.

The context of the HPAN study area includes the Bloor Street corridor to the south, a busy east-west transportation corridor; High Park south of Bloor St, a City park which includes passive and intensive recreation facilities as well as provincially and locally significant natural heritage features; Lithuania Park north of Glenlake Ave, a neighbourhood park; the Keele St corridor to the east, a busy north-south transportation corridor; and mature residential neighbourhoods characterized by prominent

urban forest canopy, remnant ravine features, and variable topography, which adjoin the HPAN study area on the east, north and west.

See Figure 1 for the location of the study area and other surrounding features including the BWVA corridor, High Park, the Humber River valley.

2. Methods

The BWVA study and this Addendum are primarily desktop studies, reliant on natural heritage information gathered from existing reports, planning applications, and available spatial data. Site visits were conducted as part of each study, however detailed field surveys (i.e. vascular plant lists, ecological community identification, wildlife surveys, tree surveys) of the HPAN area were not conducted.

2.1 Background Document Review

For the BWVA study, D&A undertook a comprehensive review of background reports and digital data provided by the City, Local Advisory Committee members, and/or from online sources. The background data is used in this report as a basis for the natural heritage characteristics of the HPAN study area. The background information reviewed included:

- Submission documents from development proposals along Bloor Street West;
- Natural heritage and ESA reports for High Park and the lower Humber River;
- Spatial data for policy area boundaries;
- Vegetation communities and Species at Risk, and;
- Wildlife data from sources including the Fatal Light Awareness Program (FLAP) and the Toronto Ornithological Club.

See *BWVA NHIS Section 9, References*, for a full list of resources used in the preparation of the report.

In addition to the BWVA NHIS background documents, additional information specific to the HPAN was reviewed, including:

- Bird Monitoring for Building Collisions at Daniels Corporation High Park (Stantec 2017); and
- Development proposals for 35 High Park Ave North, 51 Quebec Ave, and 111 Pacific Ave.

See Section 8, References for details of all documents referred to in this report.

In addition, City data, mapping and analysis from the High Park Apartment Neighbourhood Area Character Study was used to assist in the understanding of existing conditions for individual properties and of the five blocks within HPAN. Materials included:

- Natural heritage features and local parks in the vicinity of HPAN;
- Outdoor spaces and amenities, pedestrian travel routes, and environmental areas of concern identified during public consultation;
- Encumbered (landscaped areas with buildings or underground structures) and unencumbered space (landscaped areas with no buildings or underground structures);
- Tree location data (typically shade trees over 30 cm DBH); and
- Sunlight and shadow analysis.

2.2 Field Visit

On April 13, 2018 D&A staff met with representatives from the City of Toronto for an on-site field tour. The purpose of this visit was to:

- Discuss the NHIS approach with City representatives; and
- Gain an understanding of the natural heritage character of the HPAN study area.

Following an introduction to the existing status of the HPAN studies that have been conducted by the City thus far, the D&A and City representatives walked the majority of the HPAN study area, reviewing the type and placement of existing buildings, remnant native tree canopy, trees and other vegetation planted as part of the existing buildings, new development sites, unencumbered and encumbered soil areas, evidence of maintenance and management of vegetation resources, and general character of the neighbourhood. Data was gathered in the form of field notes and photographs; no new detailed characterization data was collected as part of the current study.

3. Characterization

The natural heritage characterization information in this report focuses on the HPAN study area; for details on the BWVA study area, High Park, and the Humber River Valley see *Section 3* of the BWVA NHIS. Information in this Section includes both data from background sources and incidental data gathered during the April 13, 2018 field visit.

3.1 History of the HPAN

The HPAN was previously of similar character to the surrounding existing neighbourhoods, mainly residential and consisting of detached and semi-detached homes built in the early 20th century. The current low-rise buildings, slab form apartments, and point towers were developed in the HPAN from the early 1960s to 1981. City of Toronto archival aerial photography shows the transition of the neighbourhood from detached homes from the original to current condition (see Appendix 1, containing photos from 1959, 1965, 1970, and 1981). These photographs illustrate the change in built form over this period of time, the progressive construction of the apartment buildings generally from east to west, and the pre-existing character of tree cover, which was similar to the current High Park residential neighbourhoods. Some vestiges of the previous neighbourhood remain within the HPAN mainly in the form of remnant tree cover along streets and former property lines.

3.2 Abiotic Resources

Soils

As detailed in the BWVA report, *Section 3.1*, the study area is located on the Iroquois Sand Plain, a physiographic feature which was formed at the end of the last ice age when retreating glaciers formed Lake Iroquois and deposited sand and silt along its shoreline (City of Toronto 2002). The majority of the surficial geology in the vicinity of the HPAN is comprised of sand and silty sand soils, with more variable soils in proximity to surface water features due to erosion and sedimentation and fill placement. The relative extent of introduced soil materials is unknown, however the construction of underground parking would have resulted in a large surplus of soil, much if it being removed during construction.

Development of Bloor St and surrounding neighbourhoods in the early 1900s and the HPAN in the 1960s to 1981 have altered the character of the original soils through construction activities, which has resulted in many areas consisting of a layer of asphalt or topsoil with thickness underlain with fill materials to a depth of 6 meters in certain locations (WSP 2017). In the HPAN, many of the existing green amenity spaces are underlain by parking garages, leaving few areas of unencumbered native soils (see Map 3 for spatial distribution of existing parking garages and unencumbered soils).

Hydrogeological records indicate the presence of bedrock at depths up to 58 meters below ground surface, with bedrock depth varying. A buried bedrock channel, the Laurentian channel, is hypothesized to connect Georgian Bay to Lake Ontario and may be a significant conductor of groundwater on a regional scale (WSP 2017). Investigations have indicated that the west branch of this channel may lie in the vicinity of High Park; details regarding soils and groundwater movement in the channel are not well documented. See the report Desktop Hydrogeological Investigation by WSP (2017) for more detailed information about subsurface conditions, including the Laurentian Channel.

Topography

The HPAN is located at a local topographical high point between two ravines. Steep slopes exist downwards to Keele St, and a ravine fragment is located just west of Gothic Ave, but these are outside the HPAN study area. The topography of the HPAN is generally flat, having been altered to accommodate the existing apartment buildings and associated parking structures, with low berms adjacent to some apartment buildings.. Overall, the topography drains southwards towards Lake Ontario. See Map 3 for topography within the study area.

Hydrology & Hydrogeology

The HPAN is located within the Humber River Watershed. Originally a portion of the HPAN drained into the Grenadier Pond system and a portion drained into the Spring Creek system; however, the natural drainage has been altered by stormwater measures. The HPAN is currently located entirely within the Spring Creek sewershed; all surface water from the HPAN drains to Spring Creek, one of the two surface water features in High Park (see *Appendix 4* of the BWVA NHIS for High Park surface water catchment areas).

Stormwater from the HPAN is carried by pipe to the Spring Creek Ponds in High Park just southeast of the intersection of Parkside and Bloor Streets, where it continues the southward fall of land toward Lake Ontario. From the Spring Creek Ponds, water flows through Spring Creek to the Lower Duck Pond system and discharges to the Western Beaches Tunnel (Toronto Water 2018). The flows in Spring Creek are driven primarily by stormwater, with a small amount of water input from artesian wells as well as discharge from shallow aquifers (Toronto Water 2018). The Spring Creek system is described as 'flashy', where the Spring Creek Ponds have major flows to them within about a half hour of the start of a rainfall event, resulting in elevated water levels and flows through the system, then returning to typical water levels within 2 - 8 hours of the end of the rain storm (Toronto Water 2018).

Infiltration of surface water is increasingly a priority for municipalities as an alternative method for addressing storm water; encouraging infiltration is also undertaken to transition urban systems closer to their pre-development water balance state. The existing percent imperviousness for the HPAN study area is approximately 62%, representing medium to high density of impervious cover (Toronto Water 2017). This does not account for underground parking structures, which in some areas account for 100% of the lot area, therefore impervious cover is likely higher. Higher amounts of impervious cover result in a corresponding decrease in infiltration to both the shallow and deep groundwater systems (Toronto Water 2017); infiltration in the HPAN may affect the groundwater-driven components of the Spring Creek system but this has not been documented. A study undertaken by Gartner Lee (1995) for the Grenadier Pond system identified that ground water contributed approximately 50% of total water flow to the Grenadier Pond and Wendigo Creek. No comparable study has been undertaken for Spring Creek but given the proximity of the two systems and the prevalence of sandy soils with high infiltration potential in the Spring Creek catchment there is potential for significant groundwater infiltration to this system.

3.3 Terrestrial Resources

Flora

The HPAN study area, as described in Section 3.1, is heavily urbanized with limited natural vegetation resources. Limited ecological data is available for the study area; where references are not provided in the section below the information was gathered during a reconnaissance tour of the HPAN study area conducted on April 13, 2018 by D&A in the company of three City staff. During this walking tour key observations were made of existing vegetation cover throughout the study area, as well as evidence of soil conditions, landscape maintenance practices, street tree conditions, local topography and infrastructure. Composition of canopy trees and groupings was noted.

Vegetation Communities

Due to the history of development within the HPAN, no vegetation communities defined as "natural" following the Ecological Land Classification (ELC) System for Southern Ontario (Lee et al 1998) remain within the study area boundaries. The HPAN study area is best characterized as "Anthropogenic", i.e. vegetation communities which have been created and maintained by human influences. NHIS reports prepared for 35 High Park Ave (2016), 51 Quebec Ave (2013), and 111 Pacific Ave (2017) confirm that there are no natural vegetation communities left in the portions of the HPAN studied for those reports.

Natural vegetation communities within High Park to the south of the HPAN include Dry Black Oak – Pine Tallgrass Prairie Savannah, Oak-dominated deciduous forests, Hardwood – Hemlock Mixed Forest, and a diversity of wetland habitats. The pre-settlement conditions of the HPAN would likely have exhibited characteristics similar to those now found in High Park based on the growing medium requirements of historic remnant trees found in adjacent neighbourhoods. See *Section 3.2.2.1* in the BWVA NHIS for detailed information on the ELC vegetation communities and vascular plants currently present in High Park. Several distinct areas of the HPAN retain some characteristics of native vegetation communities similar to those in High Park; see "Historic Remnant Trees".

Vascular plants / locally significant species

The majority of the vascular plants within the HPAN study area are those which have been planted as landscaping works following the conversion of the neighbourhood to apartment buildings during the 1960s - 1981. These plantings were of a limited number of mostly non-native species; this is quite different in age and species than from the adjoining residential neighbourhoods, which contain higher numbers of native trees, including some very mature specimens which may be remnants of historic forest cover. The plants present are characterized in this report into four categories based on typical conditions: street trees, landscape plantings, historic remnant trees, and opportunistic vegetation.

No flora Species at Risk are known or suspected in the HPAN; this is supported by data presented in the NHIS reports prepared for 35 High Park Ave (2016), 51 Quebec Ave (2013), and 111 Pacific Ave (2017).

Street Trees

The streetscape frontages of the existing HPAN study area consist of:

- Boulevard trees of varied species, age and spacing located in turf; and

- Along High Park and Pacific Aves, individual boulevard trees set within hard-surfaced pavement (often asphalt patches, or in some cases, surrounded by loosely laid granite paving stones that permit some water infiltration).

Nearly 50% of the tree cover is from three species: Norway Maple, Silver/Freeman Maple, and Linden; see Table 1 for a full list of species, counts, and species composition within the HPAN.

Table 1. HPAN Street Tree Inventory

Tree Type	Counts	Species Composition (%)
Maple-Norway*	97	25.0
Maple-silver/red/Freeman*	52	13.4
Linden*	39	10.1
Honeylocust	21	5.4
Oak-red/white*	19	4.9
Oak-black*	15	3.9
Maple-sugar	12	3.1
Ash	11	2.8
Catalpa	11	2.8
Elm pioneer	11	2.8
Pine-Austrian	11	2.8
Tulip	9	2.3
Elm Siberian	8	2.1
Lilac/serviceberry/Mountain ash	8	2.1
Oak-bur/pin/English	8	2.1
London plane	8	2.1
Gingko	7	1.8
Kentucky coffee/cork	7	1.8
Spruce	6	1.5
Hackberry/Katsura/Yellowwood	5	1.3
Beech	4	1.0
Black locust	4	1.0
Cherry/Pear	3	0.8
Pine-white	3	0.8
Ohio buckeye	2	0.5
Maple-black	2	0.5
Maple-hedge	2	0.5
Mulberry	2	0.5
Magnolia	1	0.3
TOTAL	**388**	**100%**

Source: City of Toronto, 2018

* Mostly mature trees with 30 cm diameter or greater

The condition of street trees was observed to be fair to good, depending on location and age. Many mature Silver/Freeman Maples were observed to have extensive above-ground root flares and/or root damage, which may be from landscape maintenance or foot traffic. Recent street tree plantings were observed along Oakmount Ave. Overhead wires are present on most streets and may be impediment to tree growth due to pruning; wires are most intensive along the south side of Glenlake Ave.

Landscape Plantings

The majority of landscape plantings represent the original species established following the conversion of the neighbourhood to apartment buildings from 1960s - 1981. A compiled tree data layer, prepared by the City of Toronto, shows a total of 699 existing trees on private property within the HPAN. NHIS reports prepared for 3 active development applications indicate that canopy cover is approximately 20% (Ages Consultants Ltd 2013, 2016, 2017). These plantings were of a limited number of species which are predominantly non-native. D&A observed Austrian Pine, Honeylocust, and Norway Maple as the dominant tree species present. Vegetation conditions throughout are almost entirely manicured and include:

- Landscaped setbacks with massed 40-50 year old deciduous and coniferous tree plantings where apartment building front onto streets, these plantings typically include:
    - Treed canopy (≤ 35% canopy closure) over turf, or
    - Grove-like woodland (>35% canopy closure), generally over mulch or bare soil;
- Ornamental beds of shrubs or perennials, typically limited to building entrances;
- Degraded/shaded groundcovers/turf under many deciduous and coniferous tree plantings; and/or
- Open turf areas are present, but access to residents is restricted in some locations.

No areas of naturalized groundcovers were observed, even under canopied groves. Many existing Austrian Pine trees, valued by residents for screening and winter interest, appear to have originally functioned as dense screen plantings. *Diplodia* needle blight was observed affecting Austrian Pines at the time of the April 13, 2018 site visit, this is a prevalent wind-borne fungal pest affecting Pine trees in southern Ontario (OMAFRA 2014).

Historic Remnant Trees

Several distinct areas of the HPAN retain tree cover that pre-existed the apartment and condo developments; these are located along original residential lot lines and contain Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*); these remnants of historic tree cover also contain more recent plantings of Linden (*Tilia* sp.), Norway Maple (*Acer platanoides*) and/or Silver/Freeman Maple (*Acer saccharinum; A. X freemanii*). The native vegetation composition in these areas consists strictly of canopy trees; no native shrub or herbaceous cover remains, and where understory vegetation exists it is dominated by non-native turf grasses. The adjoining residential neighbourhoods contain tree cover of a similar character, including some very mature specimens.

A total of 9 Black Oak trees were surveyed as part of the arborist studies for active development applications within the HPAN; all are > 50cm DBH. Other species with trees > 50cm DBH include both native and non-native trees, these trees are located throughout the HPAN study area in a variety of conditions, including City property and private property and both encumbered and unencumbered soils. Arborist reports are available for 35 High Park Ave properties (Kuntz Forestry Consulting 2016), 51 Quebec Ave (Kuntz Forestry Consulting 2015), and 111 Pacific Ave (Ferris + Associates 2017); these reports provide detailed tree information for these. Only one tree >100 cm DBH has been recorded within the HPAN, a Black Oak on City property between High Park Ave and Pacific Ave.

See Map 3, Key Biotic & Abiotic Features, for the locations of the areas of existing tree cover; areas of historic remnant trees are shown as Category 1, High Preservation Priority.

Opportunistic Vegetation

Certain species of woody plants are adept at self-seeding in both natural and ornamental landscapes. Also known as "weeds", opportunistic vegetation may originate from the landscape immediately

surrounding a site through seed rain, or via other dispersal mechanisms such as birds. These species are often aggressive and non-native, and although non-native plant species typically provide less support for wildlife than native species (Tallamy 2004), they can nonetheless offer a diversity of habitat structure (i.e. thicket habitat) that is lacking in an ornamental landscape. No naturalized areas or large concentrations of opportunistic species were noted during the April 13, 2018 site walk; the arborist studies for active development applications noted several opportunistic species common of urban environments include Tree of Heaven, Manitoba Maple, Norway Maple, and Siberian Elm. Active maintenance and heavy foot traffic throughout the HPAN likely have prevented opportunistic species from more widespread establishment.

Fauna

Breeding Birds

Based on the available data, birds likely to be breeding within the HPAN study area are urban-adapted species of low conservation concern. However, they may nonetheless may be impacted by development and some are protected by legislation such as the federal Migratory Bird Convention Act (MBCA 1994) and the provincial Fish and Wildlife Conservation Act (2002).

The list of birds potentially found in these areas can be found in *Section 3.3.1.1* of the BWVA NHIS. This list includes 23 native bird species, 4 introduced (non-native) species, and three Species at Risk (SAR). The following Species at Risk are not confirmed in the HPAN, but may be present if suitable nesting habitat exists, these species, with conservation status in brackets, are:

- Chimney Swift (THR); and
- Common Nighthawk (SC).

Both Common Nighthawk and Chimney Swift are known to nest in urban environments, and have been recorded as breeding along the Bloor Street corridor. Common Nighthawk will nest on gravel rooftops on buildings of varying heights; therefore, they may be present as breeders in the HPAN if suitable rooftops are present. Chimney Swift will nest in chimneys or large (50+ cm DBH) cavity trees; if suitable chimneys and/or cavity trees are present in the HPAN, then they could be potentially breeding. The third SAR bird noted above is Eastern Wood-Pewee (SC), however its habitat is forested environments, therefore there is no suitable habitat in the HPAN.

Migratory Birds

Given the proximity to Lake Ontario and the high-quality habitats in High Park and the Humber River Valley, many migratory birds are attracted to the vicinity of the HPAN in spring and fall. These migrants include waterbirds and landbirds (including song birds), as well as species that migrate at night (e.g. warblers) and by day (e.g. raptors, waterfowl). It is important to note that, while most of the landbird migrants stopping over are most likely to do so in High Park and the nearby Humber River Valley, many will also be found in other vegetated habitats within small parks, backyards, ravine remnants, lot-line hedgerows, etc. Therefore, migrant landbirds may occasionally utilize treed areas within the HPAN study area. However, their numbers and diversity would not meet thresholds for Significant Wildlife Habitat for this group (category Seasonal Concentration Areas of Animals: Landbird Migratory Stopover Areas); see Section 3.5 and Appendix 2 of the BWVA NHIS.

Amphibians & Reptiles

Amphibians and reptiles are not likely to be present within the HPAN study area, as no suitable breeding habitat (e.g. wetlands, ponds, watercourses) is present and any species migrating from suitable habitats within High Park would likely suffer significant road mortality from traffic on Bloor St.

Mammals

Of the fifteen species of mammal known identified in background research for the BWVA NHIS, to persist within the AOI, some of them (e.g. Gray Squirrel, Raccoon, and Striped Skunk) are well adapted to the urban matrix and are likely to exist in the HPAN study area. The higher quality habitat present in areas outside of High Park and the Humber River Valley would support increased diversity and abundance of mammal species. This would include residential and remnant ravine areas adjacent to the Bloor West Village study area. For text on the suitability of habitat in the HPAN for Species at Risk bats, see Section 3.5.

Insects

Few records for this group were found in the BWVA NHIS background review and database queries. The limited records for this group included two possible SAR insects within the Area of Influence: Monarch (Endangered federally, Special Concern provincially) and the Yellow-banded Bumble Bee (Special Concern). Monarch undoubtedly occurs in open areas, and is most likely present in High Park and the Humber River Valley. Although this species may occasionally occur in the HPAN study area in low numbers, the probability is substantially lower than in open, naturalized habitats.

3.4 Aquatic Resources

There are no aquatic resources within the HPAN study area. However, the stormwater from the study area drains into sewers which outlet to Spring Creek, thus the quality and quantity of stormwater have a direct influence on the aquatic communities of this system. As described in *Section 3.3.4* of the BWVA NHIS, biological diversity data for the Spring Creek system is limited, however following routine sediment removal from the Lower Duck Pond System observers noted extensive occurrences of reptiles and turtles, including the Special Concern Snapping Turtle (Toronto Water 2018). The ponds present at the top and the bottom of the Spring Creek system, i.e. the Spring Creek Ponds and Lower Duck Ponds respectively, limit the extent of aquatic biological life as they are occasionally emptied of water and dredged as part of routine maintenance activities.

3.5 Species at Risk & Significant Wildlife Habitat

Species at Risk

Species at Risk (SAR) are plants and animals designated as Endangered, Threatened, or Special Concern provincially or federally. As fully summarized in the BWVA NHIS, the entire BWVA Area of Influence has records for SAR birds from background data, with records or potential occurrences for vascular plants, birds, reptiles and amphibians, bats and insects. The majority of these are expected to be limited to High Park and the Humber River valley due to the availability of habitat features.

Butternut (Endangered), known from High Park, is the only plant species with any likelihood in the HPAN area; it has not been detected in existing tree surveys.

As outlined in Section 3.3.2.1 of the Bloor Street NHIS, there are numerous avian SAR that could possibly fly over the HPAN study area at considerable heights (above 300 metres) during migration. Occasionally, some of these species may be brought to the ground during adverse weather conditions and take shelter in vegetation in the HPAN. More likely, they are going to be attracted to the natural areas of High Park and the Humber River Valley. As outlined earlier, the only avian SAR likely to breed in the HPAN are Common Nighthawk (SC) and Chimney Swift (THR). Monarch (SC) may occasionally be found in the HPAN, especially during fall migration; it would be confined to open areas, particularly those with flowering plants.

As outlined in Section 3.3.3.2 of the Bloor Street NHIS, four species of Endangered bats (Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat) may be found in the area; High Park has confirmed records of Tri-colored Bat, while one or more of the Endangered Myotis species may be present. However, these species form maternity roosts in forested habitats, rather than individual residential trees, so no suitable habitat is found in the HPAN. These species are all migratory, and may pass through this area during spring and fall migration. Therefore, any of them may use suitable cavity trees and buildings (e.g. attics in houses) in the HPAN as temporary daytime roosts during these periods.

Given the current high rise built form and planted tree resources in the HPAN study area, there is minimal habitat that could support breeding or roosting SAR. However, we recommend screening of individual properties for SAR prior to development in accordance with MNRF protocols, as Chimney Swift, Common Nighthawk and endangered Bats are known within proximity of the nearby High Park/Bloor St corridor. If SAR or SAR habitat are confirmed consultation with MNRF is required.

The full SAR screening, which includes the HPAN, is found in Appendix 1 of the Bloor Street NHIS.

Significant Wildlife Habitat

The BWVA NHIS included comprehensive Significant Wildlife Habitat (SWH) analysis and mapping according to the categories provided in the Significant Wildlife Habitat Technical Guide (MNRF 2000). "Candidate" and "confirmed" SWH was identified, associated primarily with High Park and ravine areas. "Candidate" SWH required confirmation of specific parameters via field studies.

In the BWVA NHIS area, SWH was assigned only within significant natural features. Tree cover in the HPAN study area is insufficient to be considered a Landbird Migratory Stopover Areas, although presence of migrating bird species can be anticipated due to proximity to the lakeshore. Similarly, Bat Maternity Colonies also required specific forested habitat for designation as SWH. Therefore we believe there is no habitat triggering SWH within the HPAN study area.

The full SWH screening table, which includes the HPAN, is found in Appendix 2 of the BWVA NHIS.

4. Policy Analysis

The BWVA NHIS *Section 4* contains a comprehensive summary of current Federal, Provincial, Regional, and Local land use policy and regulations relevant to the natural heritage features and functions in the BWVA and HPAN study areas. Environmental policies that are directly applicable to the opportunities, constraints and potential impacts for natural environment features and functions within the HPAN study area are summarized in the following text.

4.1 Federal:

Migratory Birds Convention Act (1994)

Applies to: Entire HPAN study area wherever trees or structures are present that can support nesting of listed birds.

Implications: Incidental take of migratory birds, nests or eggs must be avoided by limiting activities during sensitive periods and mitigation measures to ensure appropriate nesting areas are re-established in the site. If any site works are to occur as a result of intensification in HPAN, vegetation clearing should not take place within the active nesting season between approximately April 1st and August 1st. If the areas proposed for development are thoroughly

checked during the active breeding season for bird nests by a qualified biologist during the construction phase, and no nests are found, then construction may be permitted.

4.2 Provincial

Provincial Policy Statement (2014)

*Applies to***:** Portions of the HPAN study area located on "adjacent lands" to the High Park Oak Woodland ANSI, where site alteration or development is proposed (see Map 2).

*Implications***:** In accordance with the PPS, the NHIS must investigate potential impacts that development on adjacent lands may have on the ecological functions of provincially significant features and demonstrate that this development will not result in negative impacts on the significant features or their ecological functions. Section 6 of this report describes and evaluates potential impacts to these features as a result of the proposed development.

- **Section 2.1.5** applies to portions of the HPAN study area, based on proximity to the High Park Oak Woodland Life Science Provincial ANSI, significant woodlands, and significant wildlife habitat. Development on adjacent lands may impact some ecological functions associated with these features (directly, indirectly, and/or cumulatively); these impacts are discussed in Section 6.
- **Section 2.1.7** applies where habitats of provincially-designated endangered or threatened species are present.
- **Section 2.1.8:** The Natural Heritage Reference Manual (2010) recommends that "adjacent lands" constitute all lands within 120m of significant woodlands and life science ANSIs. Site-specific evaluations may increase the extent of an adjacent lands determination.

It is the intent of this NHIS Addendum to address impacts related to the High Park Oak Woodland ANSI; see Sections 6 and 7 for more details.

Endangered Species Act (2007)

Applies to: HPAN study area wherever site alteration or development is proposed that could affect habitat of provincially Threatened or Endangered species.

*Implications***:** *Section 3.3.3* and *Appendix 1* of the BWVA NHIS present a detailed summary and discussion of Species at Risk that are known or potentially present in the BWVA study area and vicinity. The key SAR that would potentially affect specific development sites in the HPAN include birds and bats that may be utilizing existing buildings or cavity trees; the determination of habitat for these species requires site specific screening assessments in accordance with MNRF protocols. Migrating avian SAR may also be affected by new development.

Conservation Authorities Act (2007) and TRCA Living City Policies (2014)

*Applies to***:** Toronto and Region Conservation Authority (TRCA) is authorized under Section 28 of the Conservation Authorities Act to implement and enforce the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 166/06). TRCA has adopted Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation in 2014; these policies guide the implementation of TRCA's legislated and delegated roles and responsibilities in the planning and development approvals process.

Implications: Although the HPAN does not contain regulated features, TRCA's role in managing the natural environment is recognized in the City of Toronto Official Plan, to ensure that natural heritage is adequately addressed in development applications. Enhancements to natural features and ecological functions may be recommended by TRCA as part of development in the vicinity of protected features. Key policies applicable to the HPAN project area from Section 7, Policies for Environmental Planning, are outlined in the following text.

- **Policy 7.5.2: Plan Input and Plan Review**

  TRCA provides recommendations to municipalities related to natural heritage impact assessments and any impacts to the "Natural System" as determined through consultation with municipalities and the TRCA's Terrestrial Natural Heritage System Strategy (TNHSS). TRCA has reviewed this addendum.

4.3 Local

City of Toronto Official Plan (2015)

Applies to: Where significant intensification of land adjacent to a Neighbourhood or Apartment Neighbourhood is proposed, the City may carry out an area based study. As a result of the proposed level of intensification in recent development applications in the Apartment Neighbourhood north of High Park, an area based character study is being undertaken. Because of the significant natural features and functions located in High Park directly to the south of the HPAN and the potential for development in the HPAN to impact these features and functions, it was determined that a NHIS should be prepared as part of the character study. The HPAN was already included as part of the surrounding study area examined in the adjacent BWVA Study (Dougan, 2018) this NHIS Addendum supplements that study with additional information related to detailed site conditions in the HPAN. The results of the study will inform the Site and Area Specific Policy that is being developed for the HPAN area.

Implications: Official Plan policies 3.4.10, 3.4.12, 3.4.13 and 3.4.14 guide protection of natural heritage features and functions. Additional Official Plan policies that were also considered in the preparation of this NHIS Addendum include policies 3.4.1 (a-iii & vi) (environmentally-friendly development), 3.4.1 (b-i-iv) (water and sediment quality, natural linkages), 3.4.1 (d-i-iii) (suitable growing environments for trees), 3.4.1 (f) and 3.4.2 (wet weather flow management), These policies are described in more detail in the BWVA Study report (Dougan, 2018). See also *Endangered Species Act*.

Toronto Municipal Code Chapter 813, Article II – Street Tree Protection By-law, and Article III - Private Tree Protection By-law (2015)

Applies to: The Private Tree By-law applies to any property where trees ≥30 cm diameter at breast height (DBH) may be injured or removed as part of site alteration or development. The Street Tree By-law applies to trees of any size located within "A common or public highway, road, street, lane or any road allowance or portion thereof under the jurisdiction of the City of Toronto."

Implications: This by-law is applicable to privately-owned properties within the HPAN study area which have trees on or adjacent to their properties which may be removed or injured as a result of development activity. The key issue in the HPAN is loss of mature trees, particularly those growing within unencumbered soil area, which have ecological functions that cannot be readily replaced.

5. Impact Assessment

The activities associated with the possible infill development in the HPAN were evaluated for potential impacts to the nearby natural features and functions and existing on-site trees. This section provides a summary of potential site alterations associated with intensification, the activities associated with these site alterations, and potential effects upon existing and potential ecological features and functions characterized in Section 3. As described in the BWVA NHIS, impacts can be defined as the consequences that result from an activity or site alteration and can be either positive, neutral, or negative. Impacts can be divided into three general categories:

> **Direct Impact:** Impacts that specifically result from the proposed development layout and/or construction activities.
>
> **Indirect Impact:** Impacts that may be caused by altered uses and activities after construction is completed; they include consequences of changes in human behaviours resulting from the new development.
>
> **Cumulative Impact:** The sum of all individual effects occurring over space and time, including those that will occur in the foreseeable future.

Direct and indirect impacts are addressed in this report. It is important to note that not all impacts are negative, and that the PPS definition for "negative impacts" does not dismiss the use of mitigation to prevent, modify or alleviate the impacts to natural heritage features or functions. **Section 6**, **Recommendations**, identifies recommendations for avoidance, mitigation[1], and enhancement[2] opportunities to address the potential direct and indirect impacts of intensification and potentially benefit features and functions in High Park.

5.1 Anticipated Site Alterations

The area based character study for the HPAN study area, being undertaken by the City of Toronto, will evaluate existing physical characteristics of the Apartment Neighbourhood and identify appropriate principles, policies and guidelines that will guide future change and compatible infill development in the area. It is important to note that the area based character study does not identify which specific parcels/properties will undergo redevelopment, or when. Therefore the impacts discussed in Section 5.2 are all described as "potential". The type of infill and redevelopment that may be possible under the proposed Site and Area Specific Policies will vary from block to block and could result in the addition of a range of new buildings, including but not limited to, low rise buildings or taller apartment buildings, with underground parking which may or may not exceed the current footprint of existing underground structures; and retention of open space for soft landscaping, tree planting and outdoor amenities.

5.2 Identification of Potential Impacts

Impacts to trees and High Park ecological features and functions are limited but possible due to infill development within the HPAN. In general, the HPAN study area is already heavily altered, with the urban forest providing some habitat for migratory and breeding birds and a remaining hydrological connection to the Spring Creek system. The following sections identify the range of possible potential impacts for the type of development described in the Section 5.1 above.

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[1] *Mitigation: actions which modify site alterations to reduce their potential impacts*

[2] *Enhancement: actions which provide added ecological benefit to natural features and functions*

Direct Impacts

Direct impacts are predictable and have well-established mitigation tools; Table 1 lists the potential direct impacts within the HPAN study area.

Table 2. Summary of Potential Direct Impacts

#	**Type of Impact** *(alphabetical order)*
1	Construction impacts to wildlife
2	Increased hazard of buildings to migratory & breeding birds
3	Increase in invasive/non-native species on new development sites
4	Loss of tree / forest cover
5	Negative impacts on Species at Risk
6	Vitality impacts to remaining mature trees
7	Changes in downstream water quality and quantity
8	Loss of unencumbered soils

1. **Construction impacts**

Construction activities have the potential to negatively impact wildlife through the destruction of bird nests, physical mortality of terrestrial wildlife on construction sites, and disruption of nesting activities from increased noise and/or vibration. In addition, sediment generated through construction activates can negatively impact habitat and water quality in downstream aquatic features. Increased diligence in sediment and erosion control measures is important within the HPAN as it is entirely within the surface water catchment of Spring Creek.

Nests of migratory birds may occur on vegetation, buildings, and other structures and removal of these features during the nesting period could result in nest failure and contravention of the Migratory Birds Convention Act. The MBCA covers a variety of species including many urban-adapted birds, such as American Robins, which would find suitable nesting habitat within the HPAN study area. Construction noise also has the potential to contribute to bird nest failure. As described in Section 3.3, the majority of wildlife expected to be breeding in the study area are urban-adapted species of low conservation concern.

Failing to secure a construction site with silt fence to exclude terrestrial wildlife could result in small wildlife being harmed during the construction process, and siltation of downstream aquatic systems; the likelihood of sensitive terrestrial wildlife such as amphibians, reptiles, and bats within the HPAN study area is low as the study area does not directly abut any natural areas and does not provide high suitability habitat.

2. **Increased hazard of buildings to migratory & breeding birds**

Potential increase in buildings with glazing within the HPAN study area can create an increased collision hazard for migratory and breeding birds; this hazard is magnified due to the study area's proximity to High Park, which is considered migratory bird stopover habitat. Birds collide with buildings both in daytime and nighttime, in general daytime collisions occur because birds do not perceive glass as an obstacle to their flight path, and at nighttime illuminated buildings can act as beacons which can attract migratory birds in poor weather conditions (NYC Audubon 2007). This collision hazard has the potential to affect both common, urban species as well as species of conservation concern, as uncommon and SAR species both breed in nearby High Park and fly over the HPAN study area during migration.

High Park is a very important area for migrant birds in spring, especially during inclement weather (e.g. sudden north winds in the spring, rain or fog, etc.). During migration birds often become disorientated during inclement weather, and are attracted to the artificial light from buildings, resulting in building strikes, causing injury or death. For stopover migrants that are foraging during the day, the potential exists for these birds to be lured out of larger habitat patches in High Park, and to become trapped in courtyards, hit by cars, disturbed by cats or dogs, etc.

Bird collisions contribute to the existing overall cumulative adverse effect of buildings on bird populations, both locally and regionally. Bird species that are already declining due to other factors will be included in these impacts. However, given that the land uses around High Park are already built up, many of these impacts are already existing. Also, migrant birds would tend to be less plentiful within the HPAN than in the higher quality habitats in High Park, and those present would be reluctant to cross the significant barrier of Bloor St to enter courtyards of proposed buildings. New construction tends to have higher glazing rations which can present increased risk of bird collisions and by implementing TGS standards for all new buildings or building retrofits, many collisions can be avoided. All new development within the HPAN and elsewhere must comply with the TGS, which includes elements of bird friendly design such as low glazing ratio and solid, low reflective balcony guards.

3. Increase in invasive/non-native species on new development sites

Use of invasive/non-native species in planting plans for new developments has the potential to act as a source for the spread of non-native seed in the surrounding landscape and catchment area, contributing to reduced biodiversity over time as native species are displaced by non-native species.

Invasive plant species have the potential to impact species diversity and species richness in natural areas, as these plants "compete heavily for resources such as light, moisture and soil nutrients that native plants require to establish and grow" (OISAP 2017). Research has shown that non-native plants support 29 times less biodiversity than do native plants (Tallamy 2004). Plantings used on new development sites therefore have the potential to negatively impact biodiversity if non-native and invasive plant species are used.

This impact has equal potential to occur across the entire HPAN study area, however, it would be of limited magnitude as the study area does not directly abut any natural features. However species propagules are also spread via stormwater, and can affect downstream habitats.

4. Loss of tree cover

As discussed in *Sections 3.2.2.4* and *5.3.6* of the BWVA NHIS, tree canopy cover has aesthetic, ecological, public health, and economic benefits to the City of Toronto. Redevelopment of properties may result in the removal of existing trees, which would decrease local tree cover. As described in Section 3.3, within the HPAN trees are the key ecological feature of the study area.

Many mature trees exist within the HPAN study area (see Section 3.3), including some which are remnants of historic forest cover. The canopy cover of the HPAN study area is estimated at 20% whereas the City of Toronto's canopy cover goal is 40% (City of Toronto 2013). Many trees in the HPAN are growing on encumbered soils on top of parking garages and are likely to be removed at some point for maintenance or redevelopment of these facilities, and the timeframe for replacing the canopy cover and habitat function of these trees is medium to long term. Therefore the preservation of the remaining mature trees on unencumbered soils is paramount.

This impact has the potential to occur throughout the HPAN study area.

5. **Negative impacts on Species at Risk**

Removal of existing structures in the built environment has the potential to remove habitat structures for Species at Risk, in particular Chimney Swift, Common Nighthawk, and endangered species of Bats.

Common Nighthawk is considered nationally Threatened (COSEWIC 2017) and provincially Special Concern (MNRF 2017a). It breeds in the City of Toronto, and frequently uses gravel rooftops. Chimney Swift is considered Threatened, both federally (COSEWIC 2017) and provincially (MNRF 2017a); it relies on chimneys for nesting habitat. Bats may use built structures or trees with cavities, cracks, or loose bark as maternity roosts, however the preferred location for maternity roosts is in woodlands, not urban streetscapes (MNRF 2017b); therefore the probability of Endangered bat species being present within the HPAN study area is considered low. Species listed as Endangered or Threatened in Ontario are protected under the Endangered Species Act (ESA) under Regulation 242/08; removal of structures actively being used by Species at Risk will remove breeding habitat, which is prohibited under the ESA.

This impact has potential to occur across the entire HPAN study area, wherever existing built structures or cavity trees are proposed for removal.

6. **Vitality impacts to trees**

Redevelopment of properties may negatively impact remaining trees by direct damage, increased shadows from new buildings, changes in hydrology due to change in permeable surfaces, and/or compaction of soil in root zones.

Due to limited unencumbered soil to grow mature trees vitality impacts should be taken into consideration. This impact has equal potential to occur across the entire HPAN study area, wherever existing trees are present.

7. **Changes in downstream water quality and quantity**

The approaches for stormwater management for new construction, including infiltration approaches, for new development in the HPAN study area could impact the water quality and quantity in the Spring Creek system which includes the Spring Creek Ponds, Spring Creek itself, and the Lower Duck Ponds. As described in Section 3.2, HPAN water inputs to High Park are one of the key ecological functions of the study area.

Impermeable surfaces generate higher quantities of water flowing into the storm system as compared to permeable surfaces such as natural areas, or urbanized areas with infiltration incorporated into their design. The HPAN study area was developed before modern standards for maintaining storm water on site such as the City's Wet Weather Flow Master Plan (City of Toronto 2017) were implemented. If not mitigated, impermeable surfaces create more intensive pulses of water flow entering water bodies following rainfall events which can lead to bank erosion, down cutting of stream beds, disruption of riparian / wetland vegetation, and negative effects on viability of reliant fauna. Water quality degradation can reduce habitat availability for species which use aquatic and riparian habitats.

More detail about these systems, and potential impacts on these systems can be found in the report "Desktop Hydrogeological Investigation, Bloor West Village, Toronto, Ontario" (WSP 2017a) and the Toronto Water surface water narrative in the Bloor West Village Avenue Study (Toronto Water, et al. 2018). Please note that potential impacts to the deep groundwater system are addressed in the Bloor West Village Desktop Hydrogeological Study (WSP 2017a).

This impact is pre-existing throughout the HPAN study area, as it is already developed. Redevelopment, including removal of existing low-rise buildings and infill with new towers, has the

potential to improve on existing conditions, by providing improved water quality and reducing the flashiness of post-rainfall water rates. In general, "*improvements to overall surface water sources are expected through the implementation of on-site water balance (i.e., retention), quality and quantity controls as where new development takes place on existing sites within the study area where a high impervious coverage already exists with little to no stormwater management controls in place*" (Toronto Water 2018). However, redevelopment also has the potential to reduce water volumes to these systems through retention of water on site and/or increased infiltration. Therefore careful consideration of downstream effects of on-site surface water treatments, as required by the City, will be important to the long-term ecological stability of these systems.

8. Loss of unencumbered soils

Soils within the HPAN study area which do not have parking structures below are referred to as "unencumbered soils", whereas soils with parking areas below are "encumbered soils". The disadvantage of encumbered soil areas is that the parking structures require periodic maintenance, which may require the removal of all overburden, including vegetation. Also, some tree species require deeper soils in which to root, and the limited soil depth over underground parking garages may confine root growth, and in some cases render roots more vulnerable to frost damage. The presence of underground structures may also limit water infiltration, as these structures allow surface level water holding capacity but may impede the ability for rainwater to infiltrate deeper to recharge groundwater (TO Water 2018).

Unencumbered soils, therefore, are important for the long-term development of trees and tree canopy. If new developments are proposed which further reduce the amount of unencumbered soils present within the HPAN study area, the long-term potential for urban forest canopy enhancement will also be reduced.

This impact has equal potential to occur across the entire HPAN study area.

Indirect and Cumulative Impacts

As described in the BWVA NHIS, indirect and cumulative impacts are less predictable and harder to mitigate than direct impacts, as they occur outside of the direct development footprint. Existing legislation, and City / TRCA policies, by-laws, regulations and management plans offer opportunities to manage these impacts. Increased recreational use of High Park is the main indirect and cumulative impact that may potentially occur as a result of intensification in the HPAN.

The potential impacts of the increased use of High Park are described in detail in the BWVA NHIS; see *Section 6.4.2*.

6. Recommendations: Mitigation Measures and Enhancement Opportunities

Given the potential impacts identified in Section 5, and building on the recommendations from the BWVA NHIS, D&A has developed recommendations for mitigation in order to avoid and minimize impacts on existing ecological features and functions, and have identified enhancement opportunities to be applied within the HPAN study area.

The Biodiverse Landscape Manual, under development by City of Toronto staff, will outline in more detail HPAN-appropriate enhancement measures including plant lists for different character areas, wildlife habitat improvements, and other natural heritage opportunities.

6.1 Mitigation of Direct Impacts

Table 3. Recommendations to Avoid Potential Direct Impacts

#	Potential Impact *(alphabetical order)*	Recommended Mitigation	Existing Policies / Guidelines	Recommended Policies / Guidelines
1	**Construction impacts**	Trees to be removed outside migratory and breeding bird seasonal windows; construction sites to be contained with silt fence to minimize accidental mortality; diligence in implementing Erosion & Sediment Control measures	Migratory Birds Convention Act City required Erosion/ Sediment Control Plan under development	Runoff and sediment control during construction
2	**Increased hazard of buildings to migratory & breeding birds**	Require buildings to have bird-friendly façades, design lighting to be bird-friendly, and have bird-friendly building management operations	Toronto Green Standard Bird-Friendly Development Guidelines	For all new buildings and retrofit projects, require the highest Bird Friendly Glazing, Lighting and Lighting Control standards, and minimize glazing ratio in new buildings. Require bird-friendly stewardship guidelines be developed for residents and building operators Consider Monitoring of bird fatalities for 5 years
3	**Increase in invasive/non-native species on new development sites**	Require native and non-invasive landscaped areas; restrict use of non-native species. Identify opportunities to enhance biodiversity using species that are native to the Iroquois Sand Plain where possible	Toronto Green Standard	Promote naturalization and biodiversity to support the natural environment of High Park Refer to Biodiverse Landscape Manual for High Park Area for site-appropriate species

#	Potential Impact *(alphabetical order)*	Recommended Mitigation	Existing Policies / Guidelines	Recommended Policies / Guidelines
4	**Loss of tree cover**	Require arborist studies for all development sites, minimize tree loss and injury, replant removals with native, site-appropriate trees	Private tree by-law City Tree Protection By-law Ravine and Natural Features Protection By-law Toronto Green Standard Tree Protection Policy and Specifications for Construction Near Trees	Retain mature canopy to extent possible, especially where soils are unencumbered, identify opportunities to sustain the growth of large, long lived trees, including along boulevards
5	**Negative impacts on Species at Risk**	Protect species at risk that use urban structures (e.g., Chimney Swifts, Common Nighthawk and Bats), replace habitat if appropriate	If SAR are present, MNRF permitting process applies under Endangered Species Act	Require scoped studies for SAR that use urban structures (e.g., Chimney Swift, Bats) where buildings proposed for removal to determine presence/absence Habitat structure replacement may be appropriate (*requires MNRF consultation*)
6	**Vitality (including shadow) impacts**	Design buildings to minimize changes in existing conditions (light, soil conditions, water availability) to trees" that will be retained on and directly adjacent to site		Maintain adequate soil volumes and sunlight, particularly for category 1 and category 2 tree protection priority areas
7	**Changes in downstream water quality and quantity**	Improve water quality and reduce "flashiness" of flows through at-source measures	Existing City Wet Weather Flow Management Guidelines Erosion & Sediment Control Guidelines for Urban Construction	Site specific study and SWM enhancements to maintain water volumes and improve water quality in Spring Creek

#	Potential Impact *(alphabetical order)*	Recommended Mitigation	Existing Policies / Guidelines	Recommended Policies / Guidelines
			Toronto Green Standard	
8	**Loss of unencumbered soils**	Restrict development (above or below ground) on existing areas of unencumbered soil	No existing policies / guidelines required	Policy to maintain existing unencumbered soil areas to extent possible

1. Construction impacts

Construction impacts to wildlife and downstream water features can be *avoided* given proper planning and timing of construction activities, and implementation of effective erosion and sediment control measures.

To prevent incidental destruction of nests and/or nestlings, removal of vegetation, and/or existing buildings and structures that may support nesting, must occur outside the active nesting season (normally April 1st to August 1st). If clearing must occur during the active breeding season, surveys conducted by a qualified biologist should be completed to ascertain if active nests are present; if no nests are found, then removal may be permitted, otherwise protection of nests with buffers or delayed clearing should be practiced.

In order to minimize accidental mortality of wildlife, a sediment and erosion control plan must be prepared for all new developments. These plans include a requirement for sites to have silt fence maintained around them for the duration of construction activities. This will reduce the potential for small terrestrial wildlife to be impacted.

The installation and proper maintenance of silt fencing will also prevent sedimentation to the Spring Creek system, which could affect water quality. Installing erosion and sediment control measures prior to the start of construction and maintaining them properly throughout the construction process are critical for the protection of downstream aquatic features, as sediment can alter habitat and water quality. The Spring Creek ponds receive stormwater from the HPAN study area, and are periodically dredged, which has the potential to disrupt wildlife and vegetation which has established in these features. If the frequency of dredging the Spring Creek ponds can be minimized through containment sediment-laden runoff on site, this would minimize the impact of dredging on these features.

Adherence to the Migratory Birds Convention Act and the Toronto Green Standard is regulated through City review of development applications. No additional site-specific policies or guidelines are required for this recommendation, however the existing MBCA and sediment and erosion control standards need to be implemented and maintained.

A more detailed explanation of the MBCA and the Erosion and Sedimentation Control Guidelines for Urban Construction document (GGHACA 2006) can be found in the BWVA NHIS, *Section 7.2(1)*.

Site specific actions:

- Compliance with MBCA; and
- Preparation of and adherence to sediment and erosion control plan.

2. Increased hazards of buildings to migratory & breeding birds

Injury and/or mortality of birds caused by building strikes can be *mitigated* by implementing bird-friendly building design practices for new and retrofitted buildings.

Minimizing bird collisions through incorporation of bird-friendly building design standards will help to mitigate bird death and injury caused by proposed and retrofitted buildings. Tier 1 of the 2018 TGS requires buildings to treat a minimum of 85% of all exterior glazing within the first 12 m of the building above grade with visual markers to increase the visibility to flying birds, Tier 2 increases this requirement to 95%. We recommend that the highest standards of current TGS be applied to all new and retrofitted developments.

High Park is an important migratory bird stopover site within the City and also contains breeding habitat for many species; as the HPAN is directly north of High Park new and renovated buildings should be required to comply with the highest standards of the Toronto Green Standard. Site Design Strategy principles for proposed new buildings, as laid out in Bird-Friendly Development Guidelines (2007), should also be incorporated into building design. For more details see BWVA NHIS, *Section 7.2(2)*.

Building residents and managers can also play a part in mitigating the impact of buildings on birds by screening light sources at night, proper locating of greenery, and being aware of critical migration periods where these actions will be most effective. We recommend that "bird-friendly actions" stewardship packages be developed for residents and owner/operators of new buildings within the HPAN in order to foster bird-friendly behaviours. This could include e-notification of managers and residents of special weather events during migration periods, to encourage proactive mitigative actions on a voluntary basis.

Adherence to the TGS is regulated through City review of development applications; the City may require monitoring of bird fatalities for 5 years post-construction for new and retrofitted buildings.

Site specific actions:

- Compliance with highest standards of current TGS for bird-friendly buildings;
- Incorporating Site Design Strategy principles laid out in Bird-Friendly Development Guidelines (2007) for proposed new buildings;
- Minimize glazing ratio in new buildings;
- Development of bird-friendly stewardship packages for residents and owner/operators of new buildings; and
- Bird- appropriate building management operations.

3. Increase in invasive/non-native species on new development sites

Plantings of diverse native species can *avoid* impacts related to introduction on non-native species in the HPAN study area and *enhance* the area's ecological features and functions.

Increasing the spread of invasive and non-native species in the landscape can be *avoided* by using only native and non-invasive species in landscape plantings within the HPAN study area. Ecological *enhancements* in the HPAN study area can be achieved through increasing the abundance and diversity of native plants in both encumbered and unencumbered soils, and in roof gardens. Use of native plant species and an increase in biodiversity will support the natural environment of High Park.

Increasing the use of native species in landscape plans and urban forest plantings is an ongoing best management trend in southern Ontario. Enhancing standards in the HPAN study area will reduce sources of non-native seed in the immediate landscape of the High Park Oak Woodland ANSI, while

augmenting 'seed rain' of desirable native species. Given the very low diversity of species and habitats currently present in HPAN study area, there is a significant opportunity to add more diverse habitats through redevelopment.

The Toronto Green Standard (TGS) currently requires that all landscape plans include: a minimum of 50% native plants; native species only within setbacks from ravine and natural areas; and restrictions on the use of invasive species. Site plans which include at-grade landscaping, container plantings, and roof gardens, can all support native-dominated plantings. The Biodiverse Landscape Manual, under development by City of Toronto staff, will provide recommended plant species for different character areas within the HPAN, including encumbered soils, unencumbered soils, biodiverse green roofs, and streetscapes. Design and construction of landscape areas with a diversity of plant species and structure in mind, as well as considerations such as safety and four-season interest, will both decrease the potential for invasive species in the landscape and increase ecological function in the HPAN study area.

This recommendation applies to the entire HPAN study area wherever landscaping is proposed.

Adherence to the Toronto Green Standard is regulated through City review of development applications.

Site specific actions:

- Compliance with highest standards of current TGS for biodiversity in landscapes; and
- Promote naturalization and utilize plant lists provided in Biodiverse Landscape Manual for High Park Area for all new and retrofitted landscape plantings.

4. Loss of tree cover

Loss of tree cover can be *avoided* by preserving and protecting trees to be retained through compliance with the City's tree protection standards; loss of existing trees on encumbered soils can be *mitigated* through re-planting efforts; and the study area's ecological features and functions can be *enhanced* through planting a diversity of native tree species.

Preservation of trees is important to maintain existing mature tree canopy within the HPAN; these trees are in some cases remnants of historic forest cover, are highly valued by residents, and provide superior wildlife habitat opportunities compared to young trees (Le Roux et al 2014). Preserving these trees would also support the City's Strategic Forest Management Plan by maintaining existing canopy cover (City of Toronto 2013); Strategic Goal 1 of the Strategic Forest Management Plan is "Increase canopy cover, Protect, maintain and expand the urban forest to achieve a healthy, sustainable forest with a canopy cover of 40%." According to recent development applications, the current canopy cover within the HPAN is approximately 20% (Ages Consulting Ltd 2013, 2016, 2017), so in order to meet this goal within the HPAN study area tree canopy would need to be doubled. Where construction is to occur in the vicinity of trees, appropriate protection measures must be in place throughout the construction period (see item 6. Vitality impacts to trees below for more details).

It is understood that existing trees on encumbered soils are vulnerable to removal if underground parking facilities need to be maintained or replaced. The removal of the canopy provided by these trees can be offset by plantings of new trees, preferably fast-growing pioneer species which will replace the lost canopy quickly, and can be readily replaced if future disturbance is required. Planting lists for encumbered soil areas will be included in the Biodiverse Landscape Manual, under development by City of Toronto staff.

The 2018 TGS has robust requirements for increasing tree canopy. We recommend that highest standards of current TGS be applied within the HPAN study area; these include 1 tree for every 3 surface parking spaces, enhanced soil volumes for tree planting, and tree protection zones double the minimum size.

This recommendation applies to the entire HPAN study area, wherever there are existing trees. Adherence to the City tree by-laws and the TGS are regulated through City review of development applications and permitting.

Site specific actions:

- Arborist report to be prepared for all sites containing trees ≥30cm DBH;
- Preservation of existing trees;
- Compliance with highest standards of current TGS for urban forest; and
- Utilize plant lists provided in Biodiverse Landscape Manual for all tree plantings.

5. Negative impacts on Species at Risk (SAR)

Loss of habitat of Species-at-Risk can be *avoided* by conducting site-appropriate studies to determine presence/absence and, if required undertaking appropriate *mitigation* actions as directed by the MNRF.

Habitat of urban-adapted SAR in the HPAN study area needs to be identified through site-specific studies if buildings or trees are to be removed; these SAR include Chimney Swift, Common Nighthawk, and SAR bats. If SAR habitat is present the Endangered Species Act and its regulations need to be followed in order to avoid impacts to SAR. Supporting habitat features include chimneys, gravel roofs, and trees with cavities, cracks, or loose bark.

It is the responsibility of individual proponents to determine if SAR habitat is present and being utilized on sites proposed for redevelopment. Site-specific SAR screening studies under MNRF guidance are recommended for any structures or trees to be removed within the HPAN study area. Surveys for should follow MNRF-endorsed protocols and be carried out by qualified biologists.

Adherence to the ESA is regulated by the MNRF; we recommend that TRCA and the City require as a condition of approval, demonstration that MNRF has approved the studies and approaches to address SAR on site specific development and building permit applications. Notably, relatively minor renovations of buildings may affect SAR; therefore the screening of building permits will help to avoid losses in habitat. Replacement habitat structures, which could be included as part of roof design, may be required by MNRF; details about the appropriateness of these structures and their design will be determined by proponents through consultation with MNRF.

This recommendation applies to the entire HPAN study area wherever there are existing structures and/or trees proposed for removal.

Site specific actions:

- If trees or structures are being removed, site-specific study to determine if SAR habitat is present and being/not being utilized. If SAR are present:
    - MNRF will need to be consulted for appropriate studies and approaches to address SAR;
    - Proponent will have to demonstrate that MNRF has approved the studies and approaches to address SAR on site specific development and building permit applications; and
    - Replacement habitat structures may be required.

6. Vitality impacts to trees

Vitality impacts to trees can be *mitigated* through appropriate design and construction practices.

In order to mitigate the potential impacts of new construction on existing trees, a number of actions may apply depending on the type and age of trees present, the site, and the proposed redevelopment.

In order to maximize vitality of existing trees that will remain, analysis of building design and the existing landscape should be required to demonstrate that shadow and heat island impacts to existing trees are minimized or mitigated, and that adequate soil volumes and sunlight are available to trees. This recommendation would apply to the entire HPAN study area, wherever existing trees are present on sites to be redeveloped.

In order to mitigate trunk and root zone impacts of trees to be preserved, the City of Toronto's Tree Protection Policy and Specifications for Construction Near Trees (2016) will be followed. This document describes minimum tree protection zones (TPZ) for City street, private, and parkland trees, acceptable and prohibited activities within the TPZ, acceptable hoarding barriers, and requirements for tree protection plans. Implementation of these measures could be achieved within a construction management plan for the proposed development.

Maintaining or enhancing infiltration will be important to trees, and can be achieved through effective storm water management (see item 7. Changes in downstream water quality and quantity for more details).

The City of Toronto requires an arborist report to be prepared for all development projects where injury or removal of existing trees ≥30cm DBH is anticipated; this report needs to include recommendations for tree protection and preservation measures for all trees that are to be retained. We recommend that the additional tree mitigation actions outlined in this section be applied to all redevelopment sites within the HPAN Study area, wherever existing trees are present on sites to be redeveloped.

Adherence to the City tree by-laws is regulated through City review of development applications and permitting.

Site specific actions:

- Arborist report to be prepared for all sites containing trees ≥30cm DBH;
- For development applications with proposed buildings or building renovations affecting existing shape/height, an analysis of the building design and the existing landscape should be required to demonstrate that shadow and heat island impacts to existing trees are minimized or mitigated;
- Tree preservation measures must comply with the City of Toronto's Tree Protection Policy and Specifications for Construction Near Trees (2016); and
- Construction management plan to be developed and implemented to prevent impacts to water, soil and trees.

7. Changes in downstream water quality and quantity

The water quality and quantity of features downstream from the HPAN study area can be *enhanced* through at-source measures.

As the water features in High Park are fed by storm and ground water from the surrounding landscape (see *Section 3.3.3* of the BWVA NHIS for more details), impacts to water quality and quantity in High

Park due to redevelopment can be mitigated through at-source controls. As described in Section 3.3, the HPAN study area is fully within the catchment for Spring Creek. As the catchments feeding High Park's surface water features have been urbanized for over 100 years, they have already received the dominant effects of urbanization. For new construction the City's Wet Weather Flow Management Guidelines (WWFMG) (2017) require on-site stormwater management measures in order to control water balance, quality and quantity from each site prior to discharge. As the majority of developments within the HPAN study area pre-date the requirements of the WWFMG, they therefore release stormwater in an uncontrolled manner. New developments, which must conform to the WWFMG, are therefore expected to increase and improve overall recharge to the groundwater regime (TO Water 2018).

Several reports were prepared as part of the BWVA NHIS to study and discuss hydrological inputs and impacts in the BWVA; the findings of these reports are also applicable to the HPAN study area. These reports were:

- High Park Surface Water Features - Narrative (TO Water 2018);
- Desktop Hydrogeological Investigation, Bloor West Village (WSP 2017); and
- Municipal Servicing Future Conditions Report (WSP 2018).

The recommendations in this report are consistent with these studies; the original studies should be consulted for full details. The recommendations from these reports are as follows:

- The City of Toronto's Wet Weather Flow Management Guidelines (2017) must be fully met to provide on-site stormwater management (SWM) measures.
    - This will help to control water balance, quality and quantity from each site prior to discharge
- Submission of site specific Hydrogeological impact reports must be completed to assess the site-specific impact of development on groundwater and its discharges.
    - This will mitigate impacts of groundwater from developments in the area by controlling the maximum depth of sub-surface structures
- For each development applications at least one monitoring well must be drilled to the top of bedrock
    - This will rule out presence of an underground buried channel, or and determine that the depth to the regional aquitard is sufficient to prevent incursions into the artesian system.

(TO Water 2018)

Additional opportunities to improve groundwater recharge exists through the use of Green Infrastructure and Low Impact Development (LID) features; recommendations from the Municipal Servicing Future Conditions Report (WSP 2018) include:

- Reconstruction of roads presents an opportunity to implement green infrastructure solutions (i.e. Low Impact Development (LID) facilities) within the road cross-section;
- Facilities which are appropriate for use within a public right-of-way include:
    - Bioretention facilities,
    - Green gutters,
    - Subsurface soil cells,
    - Underground infiltration systems, and
    - Permeable pavement.

- Bioretention facilities and green gutters can be a visual enhancement to the public right-of-way, as they can include plantings, whereas soil cells and infiltration systems underground infrastructure so are largely hidden from view.

Site specific actions:

- All sites must meet the City of Toronto's Wet Weather Flow Management Guidelines (2017);
- Site specific Hydrogeological impact reports must be completed to assess the site-specific impact of development on groundwater and its discharges;
- For each development application, the area specific infiltration capability must be investigated, and measures must be included in the design to enhance area-specific recharge to the shallow groundwater regime; and
- For each development applications at least one monitoring well must be drilled to the top of bedrock.

Opportunities related to road right-of-way improvements would be implemented by the City when road improvements are undertaken.

8. Loss of Unencumbered Soils

Loss of existing unencumbered soils, which have the potential to support the long-term development of mature urban tree canopy, can be *avoided* by restricting development in targeted areas of the HPAN.

As described in the document "Preserving and Restoring Healthy Soil: Best Practices for Urban Construction (TRCA 2012), the key benefits of preserving and restoring healthy soils include:

- Restoring porosity and organic matter which increases water infiltration and holding capacity;
- Decreasing surface water runoff, soil erosion, peak flow rates in storm sewers and receiving waters, and risk of combined sewer overflows and flooding;
- Improving filtration and trapping of contaminants and excess nutrients in urban runoff;
- Aiding in maintaining aquifer water levels and base flows in streams;
- Restoring conditions needed by beneficial soil organisms that fight pests and disease and supply plants with nutrients and water;
- Allowing for the re-establishment of vigorous vegetative cover and deep root growth;
- Creating more marketable buildings and healthier, aesthetically pleasing landscapes;
- Minimizing on-going maintenance requirements of landscaped areas by reducing the need for irrigation and eliminating the need for fertilizers and pesticides and thereby saves money and helps to prevent pollution;
- Contributing to qualifying for credits in green building certification programs (e.g. Leadership in Energy and Environmental Design – LEED, Sustainable SITES).

The presence of underground garages throughout much of the HPAN study area, and the need for periodic maintenance on these structures, has resulted in limited areas with deep soil. The purpose of this recommendation is to preserve existing deep soil areas within the HPAN study area.

Site specific actions:

- Areas of unencumbered soils with development restrictions are to be determined through the High Park Apartment Neighbourhood Area Character Study. These areas will be protected from development, both above and below ground.

6.2 Consideration of Indirect and Cumulative Impacts

The magnitude of indirect and cumulative impacts from new development in the HPAN are largely dependent on the projected population growth in the BWVA corridor, the HPAN, and their use of High Park and thus are difficult to predict. In order to effectively mitigate these impacts the City, in collaboration with TRCA, must protect and improve habitats in High Park in order to increase the resilience of existing ecosystems and encourage behaviors that will minimize impacts in sensitive features and functions. Recommendations to mitigate the impacts of increased use of High Park through inventory, management, and enhancement work in High Park are provided in *Section 7.3* and *Appendix 5* of the BWVA NHIS.

7. Conclusions

Due to the High Park Apartment Neighbourhood's proximity to High Park, including the High Park Oak Woodland ANSI and High Park ESA, this Natural Heritage Impact Study has been completed to address the requirements of the Provincial Policy Statement (MMAH 2014), with guidance of the Natural Heritage Reference Manual (MNRF 2010) and the City of Toronto Official Plan (2001a). The following key requirements are the focus of this report, which builds upon the Bloor West Village Avenue Study NHIS (2018):

- Characterize the unique environmental features of the HPAN,
- Identify potential impacts from future development on natural heritage features and functions,
- Identify ways to avoid or, if avoidance is not possible, to mitigate any potential impacts from development on natural heritage features and functions; and
- Provide recommendations on ecological enhancement techniques that are appropriate for the HPAN study area.

The key findings of this NHIS are as follows:

1. There are no natural heritage features within the HPAN area, however, significant natural heritage features and functions exist in proximity to this neighbourhood;

2. The HPAN study area has been heavily altered from its historic condition by urbanization, infill, and long term human use, but components such as the urban forest and hydrological inputs continue to support the ecological features and functions of High Park;

3. Direct impacts are limited and can be mitigated;

4. Ecological enhancement opportunities, which will be detailed further in the Biodiverse Landscape Manual for the High Park Area, can increase the ecological features and functions of the HPAN study area;

5. Mitigation of indirect impacts on offsite features due to potential increase in usership is complex and requires coordinated management, policy enforcement and cooperation affecting many parties; and

6. Through implementation of the recommendations related to water quality and quantity, soils and trees, existing conditions in the HPAN can be improved to the benefit of the natural heritage features and functions of High Park.

The potential for indirect impacts to nearby natural heritage features, such as the High Park Oak Woodland ANSI, has been a major concern of stakeholders throughout the project process. Mitigation measures to address indirect and cumulative impacts are not detailed in this repot as implementation of these measures is complex, requiring coordinated management, policy enforcement and cooperation affecting many parties. Through implementation of the recommendations in this report, direct impacts on natural heritage features and functions due to future intensification within the HPAN area can be mitigated, and natural heritage features and functions enhanced to provide a supporting ecological role to the HPAN's broader ecological context.

> *While urban ecology is poised to make new breakthroughs in the functioning of complex, human-dominated ecosystems, the potential to translate scientific advances to practical applications has never been greater… The challenge going forward will be to apply an increasingly advanced and nuanced understanding of urban ecology in the practice of planning, designing, and monitoring cities as dynamic ecosystems. (Pataki 2015)*

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9. Figures

Map 1. Study Area Boundaries
Map 2. Natural Heritage Policy Classifications
Map 3. Key Biotic & Abiotic Features

PROJECT: DA17-072-01

CLIENT: City of Toronto

DATE: 24, April 2018

DRAWN BY: LWardle

Map 1: Site Context

High Park Apartment Neighbourhood NHIS

Legend

- High Park Apartment Neighbourhood Study Area
- Bloor West Village Avenue Study Boundary [1]
- Watercourse [2]
- Waterbody [2]
- Wooded Area [2]

Data Source:

1. City of Toronto
2. MNRF

0 175 350 700

Metres

SCALE: 1:15,000

N

UTM Zone 17 NAD83

Disclaimer:
The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations, features, or roads, nor as a guide to navigation. MNRF data provided by Queen's Printer of Ontario. Use of the data in any derivative product does not constitute an endorsement by the MNRF or the Ontario Government of such products.

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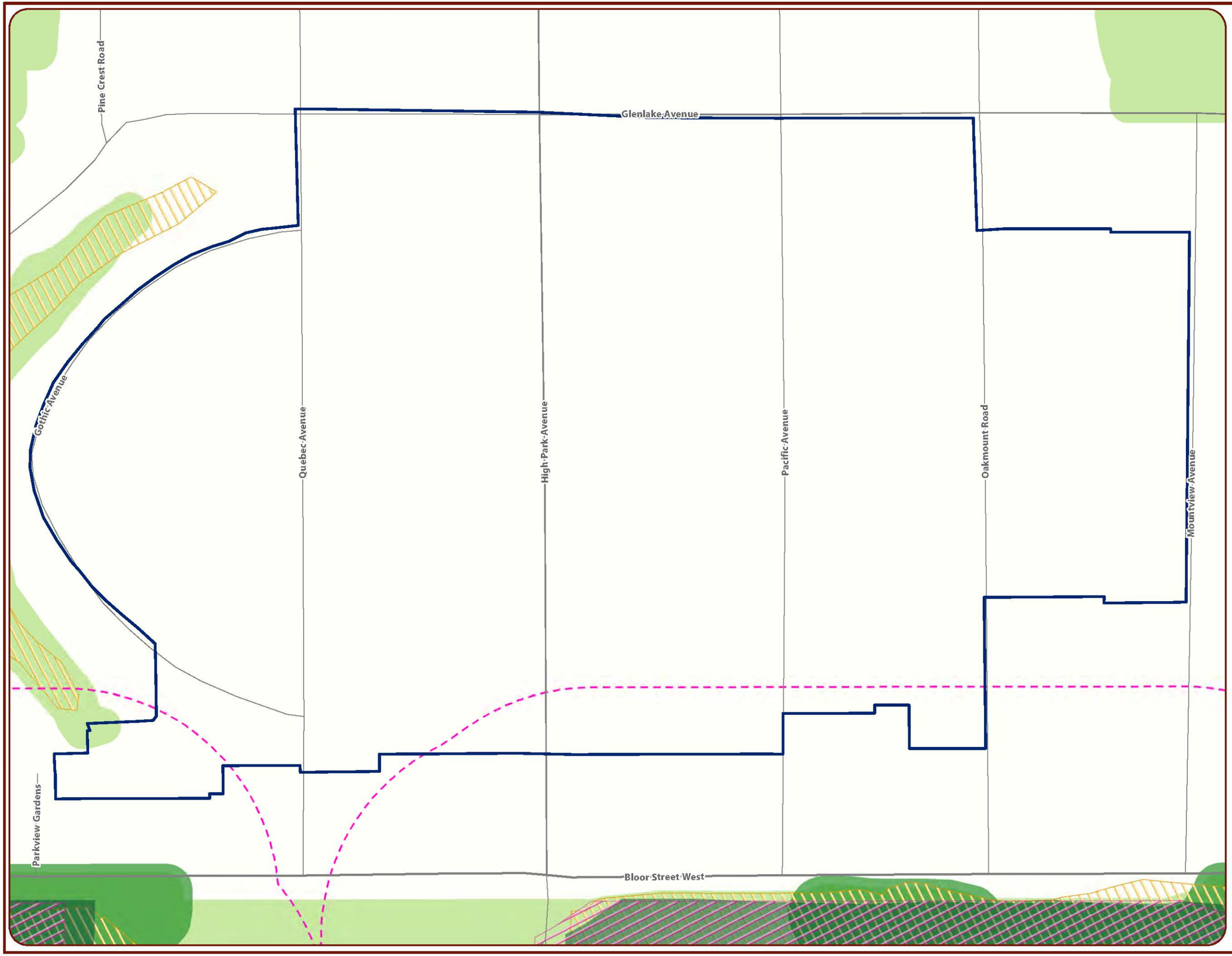
Old Weston Road
Junction Road
Laughton Avenue
Caledonia Park Road
Davenport Road
Oseler Street
Dundas Street West
Keele Street
Dupont Street
Symington Avenue
Humberside Avenue
Lansdowne Avenue
Lappin Avenue
Wallace Avenue
Dufferin Street
High Park Avenue
Glenlake Avenue
Clendenan Avenue
Bloor Street West
Indian Road
Howard Park Avenue
College Street
Brock Avenue
Parkside Drive
Roncesvalles Avenue
Sorauren Avenue
Sunnyside Avenue
High Park Boulevard
Centre Road
West Road
Colborne Lodge Drive
High Park
Morningside Avenue
Windermere Avenue
South Kingsway
Ellis Avenue
Berry Road
Stephen Drive
The Queensway

PROJECT: DA17-072-02

CLIENT: City of Toronto

DATE: 26, April 2018

DRAWN BY: LWardle



Map 2: Policy Classifications

High Park Apartment Neighbourhood NHIS

Legend

- High Park Apartment Neighbourhood Study Area
- Ravine and Natural Feature Protection By-law [3]
- TRCA Regulation Limit [3]
- Environmentally Significant Area [1]
- Natural Heritage System [1]
- Provincial ANSI [2]
- High Park ANSI 120m adjacent lands boundary

Data Source:

1. City of Toronto
2. MNRF
3. TRCA

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Metres

SCALE: 1:2,000

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UTM Zone 17 NAD83

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PROJECT: DA17-072-02

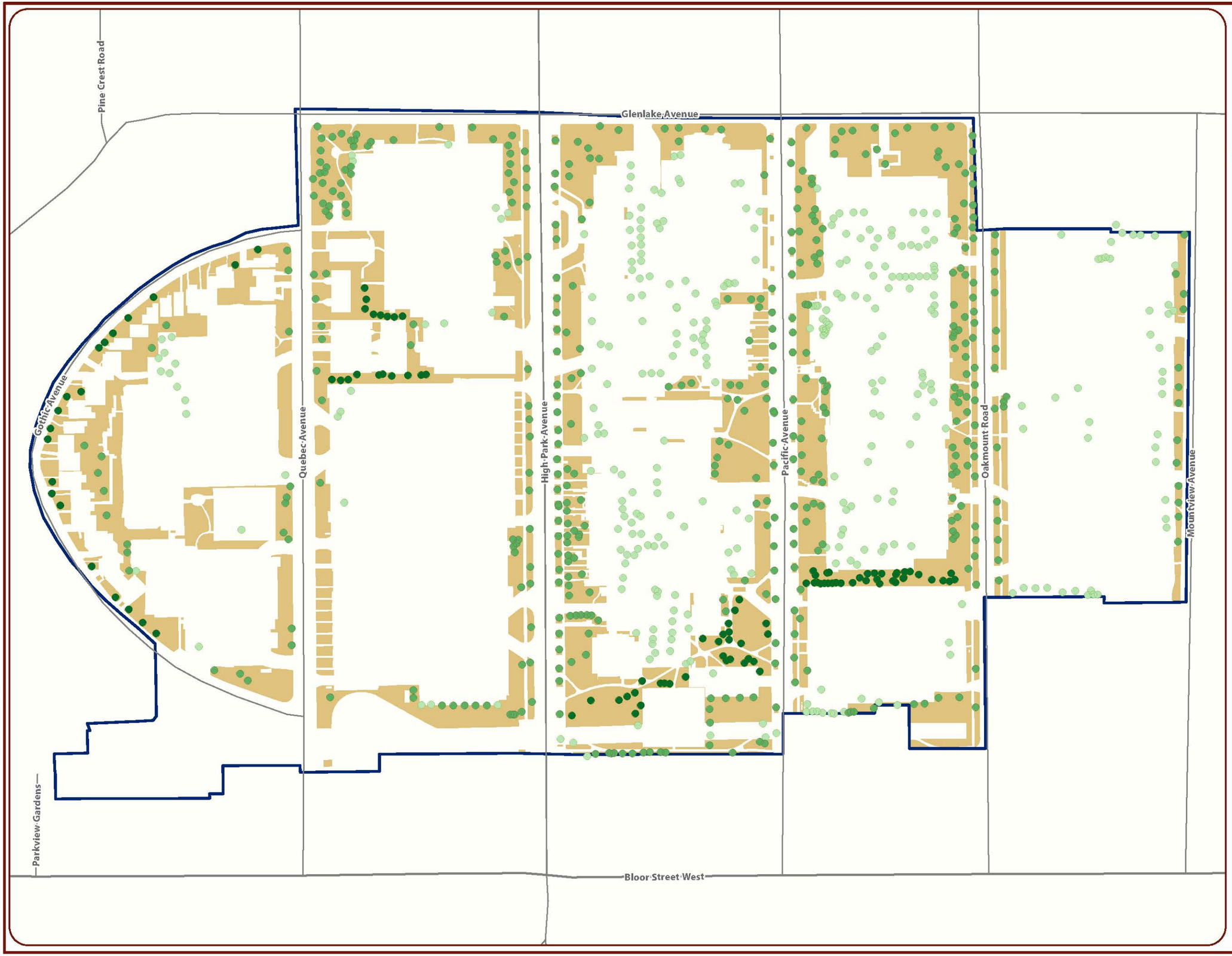
CLIENT: City of Toronto

DATE: 14, May 2018

DRAWN BY: L.Wardle

Map 3: Key Biotic & Abiotic Features

High Park Apartment Neighbourhood NHIS



Legend

- High Park Apartment Neighbourhood Study Area
- Catagory 1: High Preservation Priority Tree
- Catagory 2: Preservation Priority Tree
- Catagory 3: Other Trees on Encumbered Soils
- Unencumbered Soil Area

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Metres

SCALE: 1:2,000

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10. Appendices

Appendix 1 – Historic Air Photos of the HPAN

Appendix 1: Historic Airphotos of the HPAN

Source of airphotos: City of Toronto Archive, available online at: https://www.toronto.ca/city-government/accountability-operations-customer-service/access-city-information-or-records/city-of-toronto-archives/whats-online/maps/aerial-photographs/

Photo 1: 1959

Appendix 1: Historic Airphotos of the HPAN

Photo 2: 1965

Appendix 1: Historic Airphotos of the HPAN

Photo 3: 1970

Appendix 1: Historic Airphotos of the HPAN

Photo 4: 1981