APPENDIX A

Natural Heritage Report

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

*374 Wellington St West, Unit 3, Toronto, ON, M5E 1E3 **t** 604-629-9075*

Don Mills Channel Flood Reduction Environmental Assessment Natural Heritage Existing Conditions Report – Don Mills Channel Flood Reduction EA

Prepared for

The Municipal Infrastructure Group

November 18, 2016

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

*374 Wellington St West, Unit 3, Toronto, ON, M5E 1E3 **t** 604-629-9075*

November 18, 2016

Steve Hollingworth
Project Manager
The Municipal Infrastructure Group Inc.
8800 Dufferin Street, Suite 200
Vaughan, ON
L4K 0C5

Dear Mr. Hollingworth,

Re: Natural Heritage Existing Conditions Report – Don Mills Channel Flood Reduction EA

The following report details our methodology and summarizes existing natural environment conditions within the study area for the Don Mills Channel Flood Reduction EA. If you have any questions about the report, please do not hesitate to call me at 519-993-6870.

Thank you for the ongoing opportunity to work with your team on this project.

Yours truly,

Palmer Environmental Consulting Group Inc.

Nicole Charlton, Terrestrial Ecologist

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1 Background and Methods

1.1 Introduction and Background

The City of Markham has retained The Municipal Infrastructure Group (TMIG) to complete the re-initiated Don Mills Class Environmental Assessment (EA) to identify flood remediation solutions. Palmer Environmental is undertaking the natural environment component of the study. The current study builds upon work conducted by Clarifica Inc. in 2006 for the original flood remediation EA, which was subsequently put on hold by the City in 2009.

For the purposes of this natural heritage existing conditions report, the study area has been defined as the channel and riparian area from east of Highway 404 to just north of Steeles Avenue East, as shown on Figures 1.1 – 1.3 in Appendix A. The following outlines the study approach and identifies the existing aquatic and terrestrial conditions within the study area.

1.2 Approach

1.2.1 Background Review

A detailed review of background information related to the natural heritage features of the study area was completed. The Toronto and Region Conservation Authority (TRCA) and Ministry of Natural Resources and Foresty (MNRF) were contacted by the project team for relevant natural heritage information or records for the study area. The background review included a search of available documents and online databases (e.g., the MNRF's Natural Heritage Information Centre) for existing information on flora, fauna, wetlands, fish and wildlife habitat in the area. The following reports containing specific information for the study area were reviewed for context and to identify information gaps: Don Mills Ditch Technical Memo #1 (Clarifica, November 27, 2006); Don Mills Technical Memo #2 (Cole Engineering, May 2010).

1.2.2 Field Methods

Palmer Environmental ecologists undertook field investigations to inventory the flora and fauna of the site, assess habitat characteristics, and to provide an assessment of the ecological features and functions within the study area. The field surveys were carried out on August 9 and September 7, 2016. Detailed methods are described below.

Fish Habitat Surveys

Upon completing the secondary information review, a qualified fish ecologist conducted field investigations on September 7th, 2016, along the 3km stretch of the Don Mills Channel. The following key aquatic habitat features and conditions were documented: in-stream cover, aquatic vegetation, fish passage barriers; and, any specialized habitat features such as areas for spawning or rearing. Considering the availability of fish

community data from secondary sources (including that documented in Cole Engineering (2010), fish community surveys were not conducted for this assessment.

Terrestrial Surveys

Vegetation Communities and Flora

Vegetation communities were mapped and described following the Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al*. 1998). Information collected included dominant species cover, community structure, presence of indicator species, and other notable features. Botanical surveys were completed in conjunction with ELC by walking the creek alignment and recording species observed. The area on the west side of Highway 404 to the west side of Summerdale Park at Leslie Street was also walked to provide additional information on local site conditions. Provincial plant status was based on the Provincially Rare Flora of Ontario (Oldham and Brinker, 2009) and the Natural Heritage Information Centre (NHIC, 2016).

Wildlife

Given the urban and disturbed nature of the site, wildlife surveys focused on identifying any sensitive habitat features (e.g., amphibian breeding habitat) and noting the general character of the habitat along the creek alignment. The surveys were conducted in conjunction with ELC surveys. All culverts were examined for Barn Swallow nests and any other wildlife observations were recorded.

2 Existing Conditions

2.1.1 Fisheries and Aquatic Habitat

Habitat conditions to the northwest of Highway 404 outside of the current study area were characterized to provide context for the local area. During studies in 2010, the only fish in the entire study area were caught in this reach – two Creek chub, *Semotilus atromaculatus*, although benthic invertebrate sampling at the same time indicated degraded water quality (Cole Engineering, 2010). Habitat conditions were therefore assessed to provide confirmation of these previous assessments, as well as a comparison to the downstream reaches.

Upstream of the study area in Summerdale Park, the channel flows through a naturalized area. The stream provides fair-good fish habitat in this reach, with a mix of sand substrate (70 %), gravel (15 %), and boulder (15 %). Riparian cover (primarily Manitoba maple) provides some overhanging shade, and undercut banks provide potential fish refuge. There is evidence of bank erosion in multiple places, with exposed tree roots in some areas, and debris from flooding present in the trees. The channel wetted width ranges from 2 to 4 m, with about 1m water depth, with full clarity to the substrate. Downstream of Summerdale Park the channel has been straightened, as it runs alongside the Highway 404. There is additional evidence of exposed banks, and debris from flooding events at the high water mark. No aquatic vegetation was present

in the main channel, and overhanging shade was limited to riparian trees. Substrate consisted of 90% sand and 10% gravel. Flow was low during the habitat assessment, and water depth was approximately 50 cm.

Once the channel re-emerges on the east side of the Highway 404 into the current study area, aquatic habitat conditions deteriorate. There was no flow during the time of assessment, and the water was stagnant, with thick algae and aquatic vegetation present. The water was turbid and it was not possible to see to the substrate in sections. The wetted width is approximately 10 m at this location. Gabion baskets and rip-rap have been added as bank stabilization, with some boulders observed in the main channel substrate.

Downstream of Steelcase Road West, the channel has been constrained as it flows through an industrial complex. There is garbage dumped in the channel, with stagnant water, and an abundance of green algae. There was little flow, and water depth was less than 1 m, and wetted width approximately 7 m. There are some sections of more natural channel conditions within this reach, with some overhanging shrubs and trees. Water quality conditions remain degraded however, with stagnant water and garbage present in multiple locations.

Downstream of Woodbine Avenue, the channel has been altered (straightened) and it flows through a culvert and concrete lined channel. There is little- to no- flow, and the water is choked with green alage. Downstream of Steelcase Road East, the channel is no longer concrete lined, and the substrate is natural, primarily consisting of sand. The channel wetted width is approximately 1 m, and less than 20 cm depth, with little- to no- flow observed. Storm sewers inputs were observed further downstream which contributed to some observed flow, but overall the aquatic habitat characteristics remained similar to the culvert at Steeles Avenue East.

Overall, the aquatic habitat assessment indicated a highly degraded, urbanized, and impaired environment. The available records from MNRF did not indicate any fish species of concern, and no fish were observed during the habitat survey. The only fish caught in 2010 were upstream of the Highway 404 (Cole, 2010), outside of the current study area. It is unlikely that any of the reaches downstream of the Highway 404 support consistently viable fish habitat. Water quality is degraded, and the numerous storm flows would alter aquatic conditions (temperature and velocity fluctuations), further degrading the habitat suitability for fish. The numerous culverts and flood events also likely provide barriers to fish migration. The existing conditions observed in 2016 are consistent with those observed in 2010 (Cole Engineering), and 2006 (Clarifica).

2.1.2 Vegetation and Terrestrial Habitat

The Don Mills channel is a highly modified channel constrained by surrounding industrial and commercial uses, with generally only a thin band of riparian habitat along its length. In general, vegetation conditions along the creek alignment are consistent with those reported by Clarifica (2006). The majority of the creek riparian habitat is represented by relatively steep and narrow ditch habitat dominated by common and/or weedy herbaceous vegetation (Cultural Meadow). Varying proportions of shrubs and trees are present,

generally as planted linear or isolated occurrences. In-stream wetland vegetation was rare, and when present, confined to sparse, isolated occurrences along the channel banks.

Conditions northwest of Highway 404 (adjacent to, but outside of, the current study area) provide the higher quality natural habitat within the general area, including pockets of lowland forest and marsh wetland, the latter of which showed some evidence of groundwater contribution.

2.1.2.1 Vegetation Communities

In total, five vegetation community types were observed within the study area for Don Mills channel, with descriptions provided below. Vegetation community mapping is shown on Figures 1.1 - 1.3.

Cultural Meadow (CUM1-1)

This community type is the most widespread throughout the study area, occupying the channel banks from Steelcase Road West to Steeles Avenue. These communities are characterized by open herbaceous layers of common and non-native herbaceous species, with the most abundant species being Awnless Brome (*Bromus inermis* ssp. *inermis*), Tall Goldenrod (*Solidago canadensis* var. *scabra*), swallow-wort species (*Cynanchum* sp.), Reed-canary Grass (*Phalaris arundinacea*), Riverbank Grape (*Vitis riparia*) and Wild Carrot (*Daucus carota*). Scattered, infrequent shrubs and woody species predominantly include Manitoba Maple (*Acer negundo*), Red-osier Dogwood (*Cornus sericea* ssp. *sericea*), Green Ash (*Fraxinus pensylvanica*) and willow species (*Salix* sp). Trees (singly or in linear rows) are present along many upper bank portions of the riparian habitat. Species include Manitoba Maple, Norway Maple (*Acer platanoides*), Freeman's Maple (*Acer x freemanii*), willows, and Siberian Elm (*Ulmus pumila*).

Cultural Thicket (CUT1)

This community type occurs in one location in a complex with cultural meadow habitat. Shrub and young tree cover, represented by a mix of species including Manitoba Maple, Green Ash, Red-osier Dogwood, and Staghorn Sumac (*Rhus hirta*), is sufficiently dense to completely shade much of the available ground area. In non-woody cover areas, cultural meadow species predominate.

Cattail Mineral Shallow Marsh (MAS2-1)

This community occurs in one location directly east of Highway 404 within its ditch, north of the Don Mills channel and SWT2-2 community. Given its location, it is assumed to be of anthropogenic origin and likely collects runoff and drainage from adjacent areas. Built forms for vegetation stabilization are visible on the banks surrounding the community. The community is dominated by a very dense herbaceous layer of Narrow-leaved Cattail (*Typha angustifollia*). Property access was not possible in this area and observations were made from the edge only.

Willow Mineral Thicket Swamp (SWT2-2)

This small community occurs along the banks of the creek directly east of the Highway 404. The dominant vegetation is willow shrubs (*Salix* sp), which occupy the channel bottomland and banks. Property access was not possible in this area and observations were made from the edge only. The community appears to

be the result of reconstruction and restoration activities, given the presence of large cobbles within the stream and along its banks and the constructed nature of the surrounding area.

Open Aquatic (OA)

This community occurs in one location, directly east of Highway 404 within the ditch, south of the channel and the SWT2-2, and consists of open water habitat. Built forms for vegetation stabilization are visible on the banks surrounding the community. Like the MAS2-1, it is assumed to be of anthropogenic origin and likely collects runoff and drainage from adjacent areas.

2.1.2.2 Vascular Flora

A total of 46 species were observed in the study area during the field surveys. Of these, 23 (50%) are non-native. All of the native species have S-Ranks[1] of S5 or S4, indicating they are common and secure, or apparently secure, in the province. Additionally, all of the native species have CC[2] values of 1 - 5, indicating a high to moderate tolerance to disturbance (Oldham *et al*. 1995). These results are as expected given the urban and highly modified character of the site. A vascular plant list is provided in Appendix B.

2.1.3 Wildlife and Wildlife Habitat

No wildlife was observed within the study area during the field surveys and no nests were located in any culverts during field surveys. Wildlife habitat opportunities within the study area are restricted to urban-adapted species of open or edge habitats. Some areas of the stream may have potential to support limited frog breeding of species that utilize streams, such as Green Frog (*Lithobates clamitans*), but no frogs were observed during field surveys. More suitable breeding opportunities may be provided by the wetland marsh habitat in Summerdale Park northwest of the study area as it is better buffered from adjacent land uses. The channel likely provides only very limited movement or foraging opportunities for turtles. The riparian vegetation is interrupted in several locations by expanses of parking lot and major or minor road crossings and as such it may provide only very limited linkage or corridor functions for wildlife along its route. Road noise is severe throughout the study area.

2.1.4 Species at Risk

For the purposes of this report, Species At Risk (SAR) are those species listed as Endangered or Threatened under the Ontario *Endangered Species Act* (ESA, 2007). Such species and their habitats are afforded protection from harm or destruction under the *Act*. Correspondence with MNRF and the background review identified the potential of occurrences for Barn Swallow (*Hirundo rustica*, listed as Threatened), Blanding's Turtle (*Emydoidea blandingii*, listed as Threatened), and Butternut (*Juglans*

[1] Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario

[2] CC = Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

cinerea, listed as Endangered) within the study area. Searches for these species or suitable habitat were conducted during field surveys. No Butternut trees or Barn Swallow were observed (including nests or foraging / flight activity) within the study area. Barn Swallow nests were observed on the Leslie Street Bridge at the west end of Summerdale Park, outside of the study area. No wetlands suitable for Blanding's Turtle were observed and it is considered unlikely that Blanding's Turtles would be found within the study area. No other flora or fauna SAR were observed during field surveys.

2.1.5 Significant Natural and Environmentally Sensitive Areas

The Don Mills stream corridor is designated as part of the Greenway System of the City of Markham Official Plan, but no Provincially Significant Wetlands, Areas of Natural and Scientific Interest, Environmentally Significant / Sensitive Areas, or other provincially designated environmental features are present within the study area. One unevaluated wetland is present within Summerdale Park, northwest of the current study area.

2.1.6 Summary of Existing Conditions

Our field results indicate the existing aquatic and riparian areas provide low-quality, size-limited, and fragmented natural habitat opportunities, with no significant ecological features or functions present (e.g., no significant wetlands or sensitive wildlife habitats). There exists opportunities for localised habitat improvements throughout the study area.

References

Clarifica Inc. 2006. Don Mills Ditch Technical Memo #1.

Cole Engineering. 2010. Don Mills Technical Memo #2.

Lee, H.T, W.D. Bakowsky, J.L. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray, 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Region, Science Development and Transfer Branch. Technical Manual ELC-005.

Ministry of Natural Resources and Forestry (MNRF). 2016. Make a Map: Natural Heritage Areas. http://www.giscoeapp.lrc.gov.on.ca/web/MNR/NHLUPS/NaturalHeritage/Viewer/Viewer.html?utm_source=MNRCentral&utm_medium=Twitter&utm_term=natural%2Bheritage&utm_content=natural%2Bheritage%2Bbiodiversity&utm_campaign=Biodiversity

Natural Heritage Information Centre. 2016. Natural Heritage Information Centre Species Lists. Ministry of Natural Resources. https://www.ontario.ca/page/get-natural-heritage-information

Oldham, M.J., and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario.

Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.

Appendix A

Figures

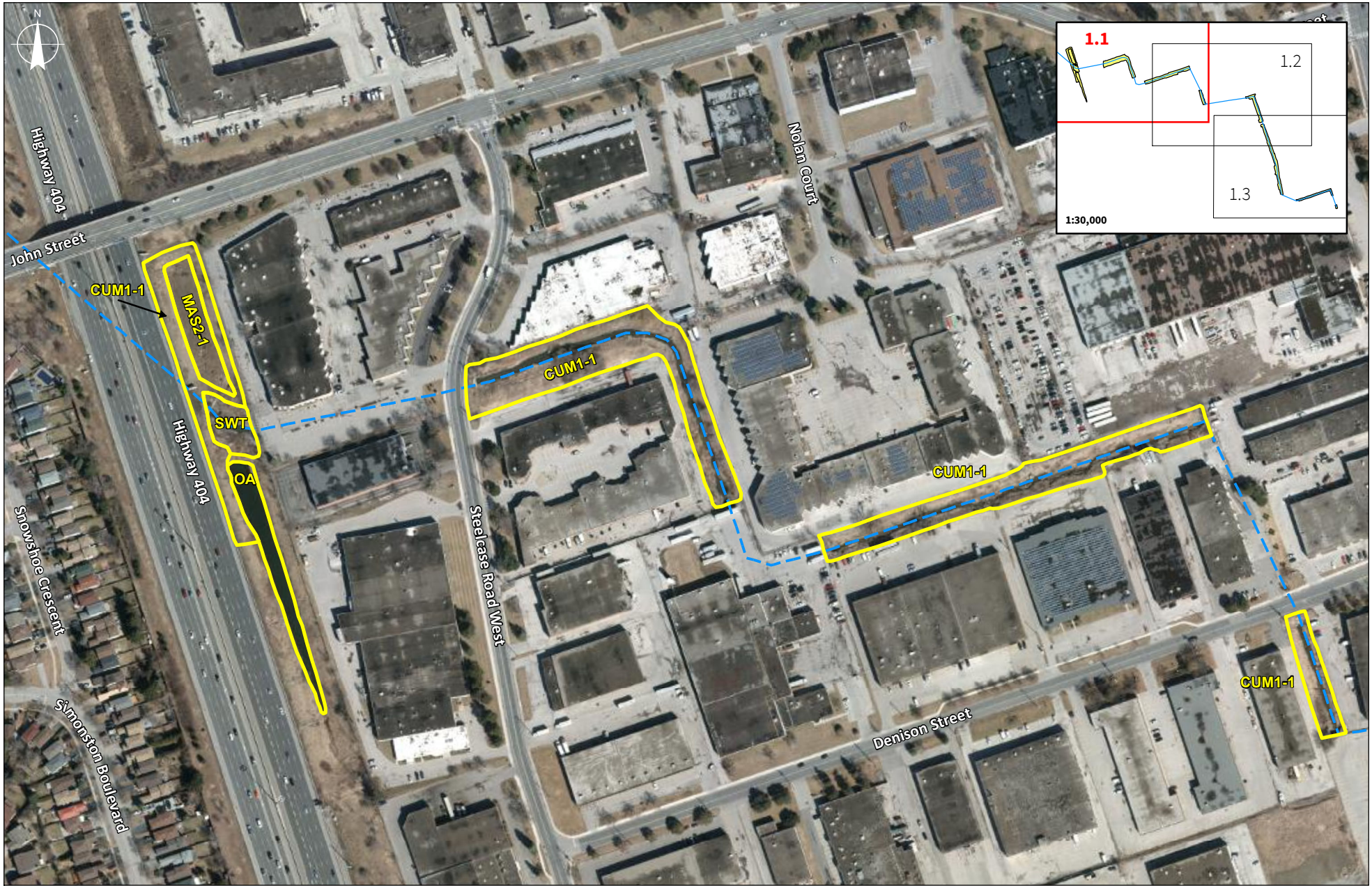

FIGURE 1.1 Existing Conditions

Project: Don Mills Channel Flood Reduction EA

Client: TMIG

0 25 50 75 100

Meters

Scale: 1:3,500

NAD 83 UTM 17 N

LEGEND

Watercourse (approximate alignment)

Vegetation community

Vegetation Communities

CUM1-1	Dry-Moist Old Field Meadow Type (Cultural Meadow)
CUT1	Mineral Cultural Woodland Ecosite
MAS2-1	Cattail Mineral Shallow Marsh Type
OA	Open Aquatic
SWT2-2	Willow Mineral Thicket Swamp

SOURCE NOTES

1. Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

DRAFT

DRAWN: B. Elder	Project: 13119
CHECKED: N. Charlton	16/11/2016

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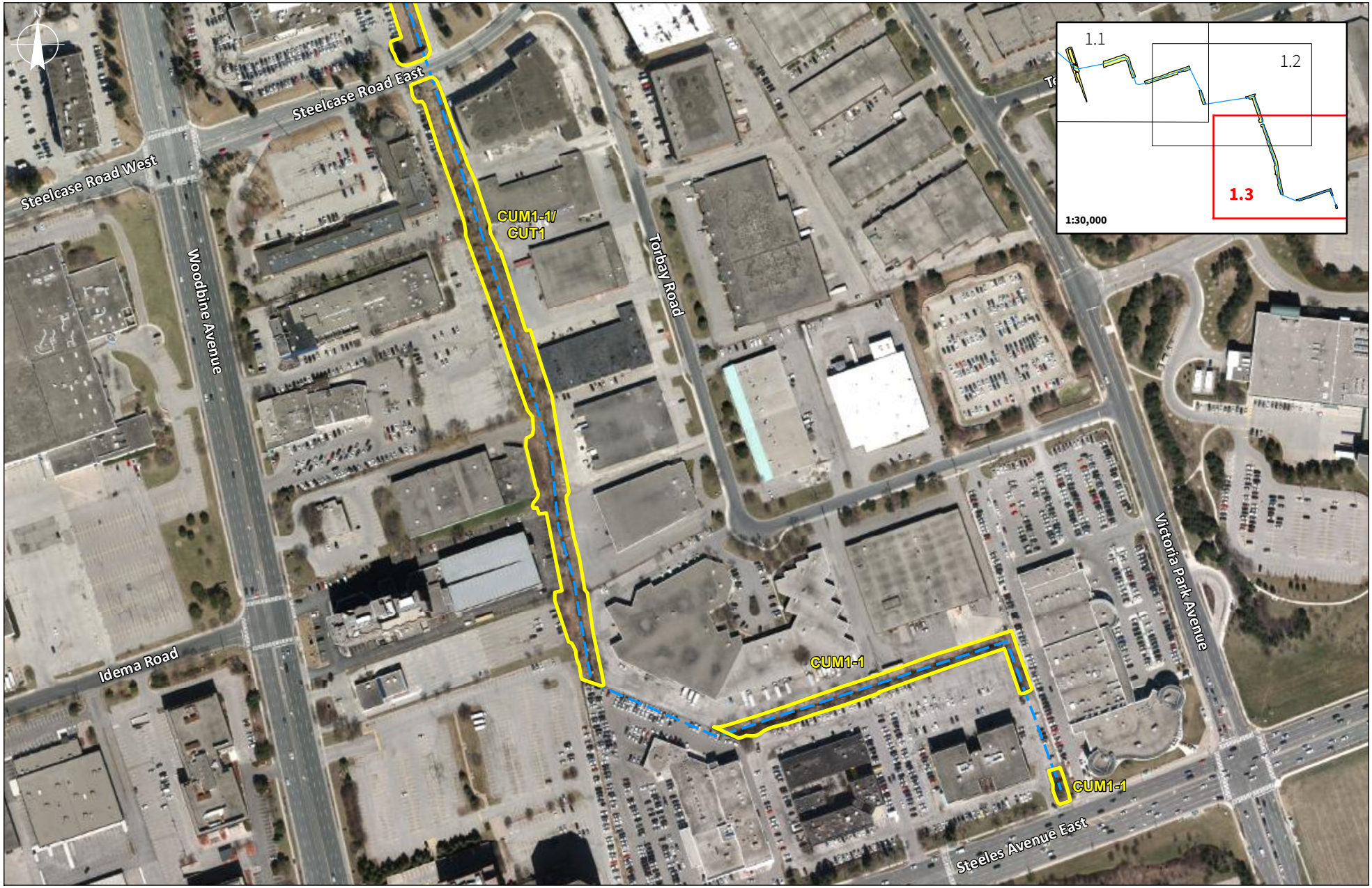

FIGURE 1.3 Existing Conditions

Project: Don Mills Channel Flood Reduction EA

Client: TMIG

0 25 50 75 100

Meters

Scale: 1:3,500

NAD 83 UTM 17 N

LEGEND

Watercourse (approximate alignment)

Vegetation community

Vegetation Communities

CUM1-1	Dry-Moist Old Field Meadow Type (Cultural Meadow)
CUT1	Mineral Cultural Woodland Ecosite
MAS2-1	Cattail Mineral Shallow Marsh Type
OA	Open Aquatic
SWT2-2	Willow Mineral Thicket Swamp

SOURCE NOTES

1. Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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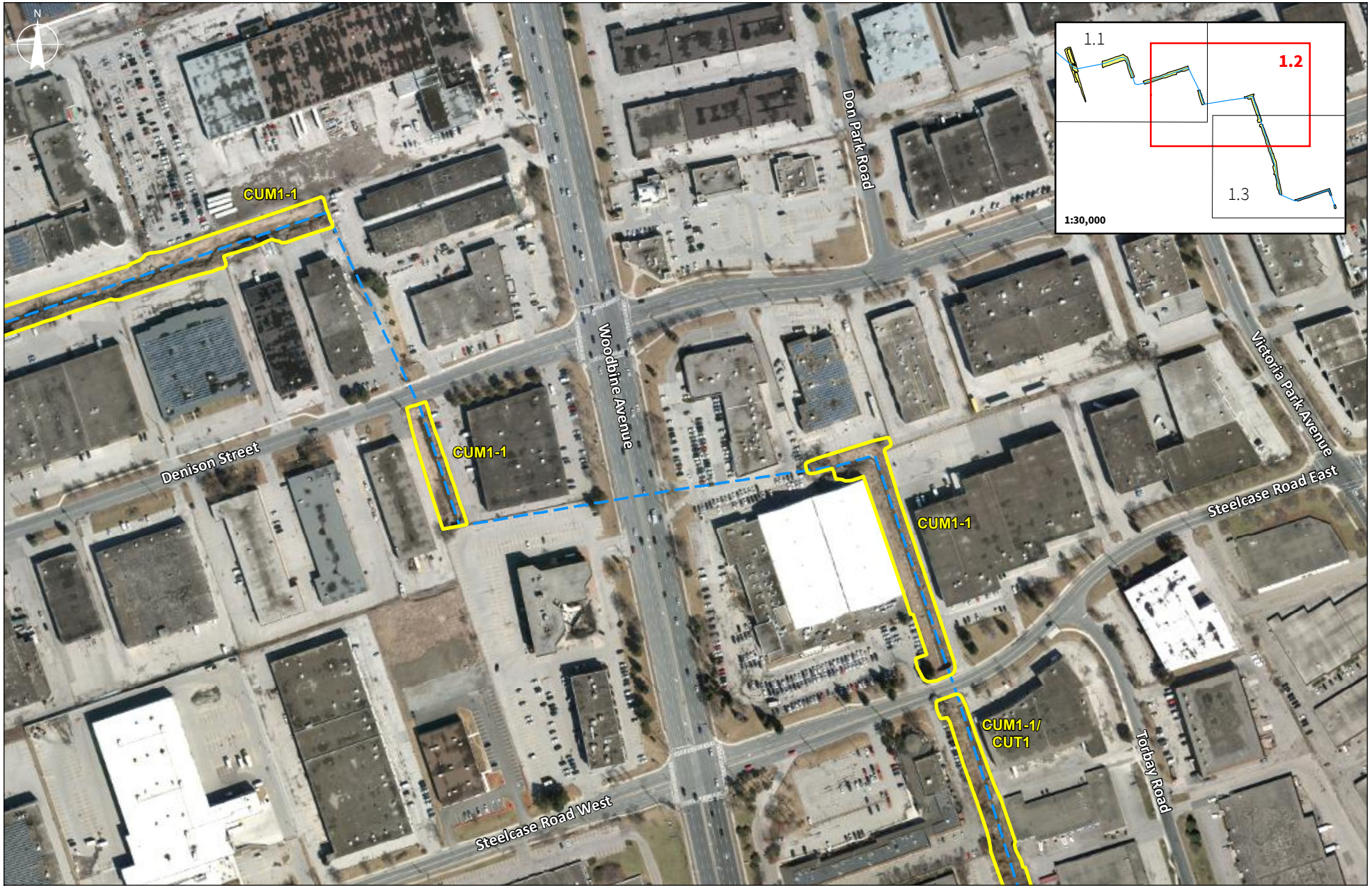

FIGURE 1.2 Existing Conditions

Project: Don Mills Channel Flood Reduction EA

Client: TMIG

0 25 50 75 100

Meters

Scale: 1:3,500

NAD 83 UTM 17 N

LEGEND

- Watercourse (approximate alignment)
- Vegetation community

Vegetation Communities

CUM1-1	Dry-Moist Old Field Meadow Type (Cultural Meadow)
CUT1	Mineral Cultural Woodland Ecosite
MAS2-1	Cattail Mineral Shallow Marsh Type
OA	Open Aquatic
SWT2-2	Willow Mineral Thicket Swamp

SOURCE NOTES

1. Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Appendix B

Vascular Plant List

Don Mills Channel Flood Reduction EA - Vascular Plant List

Scientific Name	Common Name	COSEWIC[1]	MNRF[2]	GRank[3]	SRANK[4]	cc[5]	cw[5]
Juglans nigra	Black Walnut			G5	S4	5	3
Acer negundo	Manitoba Maple			G5	S5	1	-2
Acer X freemanii	Freeman's Maple			G?	S5		0
Anemone canadensis	Canada Anemone			G5	S5	3	-3
Atriplex patula	Halberd-leaf Saltbush			G5	S5	1	-2
Cornus sericea ssp. sericea	Red-osier Dogwood			G5	S5	2	-3
Echinocystis lobata	Wild Mock-cucumber			G5	S5	3	-2
Euthamia graminifolia	Grass-leaved Goldenrod			G5	S5	2	-2
Fraxinus pennsylvanica	Green Ash			G5	S5	3	-3
Lysimachia ciliata	Fringed Loosestrife			G5	S5	4	-3
Mentha arvensis	Corn Mint			G5	S5	3	-3
Parthenocissus vitacea	Thicket Creeper			G5	S5	3	3
Phalaris arundinacea	Reed Canary Grass			G5	S5	1	-4
Prunus virginiana var. virginiana	Choke Cherry			G5T?	S5	2	1
Rhus hirta	Staghorn Sumac			G5	S5	1	5
Ribes americanum	Wild Black Currant			G5	S5	4	-3
Solidago canadensis var. scabra	Tall Goldenrod			G?	S5	1	3
Symphyotrichum novae-angliae	New England Aster			G5	S5	2	-3
Typha angustifolia	Narrow-leaved Cattail			G5	S5	3	-5
Ulmus americana	American Elm			G5?	S5	3	-2
Vitis riparia	Riverbank Grape			G5	S5	1	-2
Xanthium strumarium	Rough Cockle-bur			G?	S5	2	0
Ulmus pumila	Siberian Elm			G?	SE3	0	5
Acer platanoides	Norway Maple			G?	SE5	0	5
Aegopodium podagraria	Goutweed			G?	SE5	0	0
Alliaria petiolata	Garlic Mustard			G?	SE5	0	0
Arctium minus	Lesser Burdock			G?T?	SE5	0	5
Bromus inermis ssp. inermis	Smooth Brome			G4G5T?	SE5	0	5
Cichorium intybus	Chicory			G?	SE5	0	5
Cirsium arvense	Crepping Thistle			G?	SE5	0	3
Daucus carota	Queen Anne's Lace			G?	SE5	0	5
Hesperis matronalis	Dame's Rocket			G4G5	SE5	0	5
Linaria vulgaris	Butter-and-eggs			G?	SE5	0	5
Lolium arundinaceum	Kentucky Fescue			G?	SE5	0	2
Lonicera tatarica	Tartarian Honeysuckle			G?	SE5	0	3
Lotus corniculatus	Bird's-foot Trefoil			G?	SE5	0	1
Morus alba	White Mulberry			G?	SE5	0	0

Scientific Name	Common Name	COSEWIC[1]	MNRF[2]	GRank[3]	SRANK[4]	cc[5]	cw[5]
Populus alba	White Poplar			G5	SE5	0	5
Rhamnus cathartica	Buckthorn			G?	SE5	0	3
Robinia pseudo-acacia	Black Locust			G5	SE5	0	4
Solanum dulcamara	Climbing Nightshade			G?	SE5	0	0
Sonchus arvensis ssp. arvensis	Field Sowthistle			G?T?	SE5	0	1
Tussilago farfara	Colt's Foot			G?	SE5	0	3
Vicia cracca	Tufted Vetch			G?	SE5	0	5
Cynanchum sp	Swallow-wort Species					0	0
Salix sp	Willow Species					0	0

LEGEND

[1]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

EXT - Extinct - A species that no longer exists.

EXP - Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.

END - Endangered - A species facing imminent extirpation or extinction.

THR - Threatened - A species likely to become endangered if limiting factors are not reversed.

SC - Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

NAR - Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.

DD - Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

[2]MNRF (Ministry of Natural Resources and Forestry)

The provincial review process is implemented by the MNRF's Committee on the Status of Species at Risk in Ontario (COSSARO).

EXT – Extinct - A species that no longer exists anywhere.

EXP – Extirpated - A species that no longer exists in the wild in Ontario but still occurs elsewhere.

END - Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA).

THR – Threatened - A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SC - Special Concern (formerly Vulnerable) - A species with characteristics that make it sensitive to human activities or natural events.

NAR - Not at Risk - A species that has been evaluated and found to be not at risk.

DD - Data Deficient (formerly Indeterminate) - A species for which there is insufficient information for a provincial status recommendation.

[3]G-Rank (Global)

Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety. (Global Status from MNR Biodiversity Explorer September 2012)

G1 Extremely rare—usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2 Very rare—usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
G3 Rare to uncommon—usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4 Common—usually more than 100 occurrences; usually not susceptible to immediate threats.
G5 Very common—demonstrably secure under present conditions.

Variant Ranks
G#G# - Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
GU – Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.
GNR – Unranked – Global rank not yet assessed
GNA – Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Rank Qualifiers
? - Inexact Numeric Rank—Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.
Q - Questionable taxonomy that may reduce conservation priority—Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower-priority (numerically higher) conservation status rank. The "Q" modifier is only used at a global level and not at a national or subnational level.
C - Captive or Cultivated Only—Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The "C" modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to "Extinct" in the Wild (EW) in IUCN's Red List terminology (IUCN 2001).

[4]S-Ranks (Provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. *(Provincial Status from MNR Biodiversity Explorer September 2012*)

S1 - Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2 – Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 – Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 - Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 – Secure - Common, widespread, and abundant in the nation or state/province.
S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

SX - Presumed Extirpated - Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH - Possibly Extirpated (Historical) - Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

SE – Species is considered exotic in Ontario

SNR - Unranked – Nation of state/province conservation status not yet assessed.

SU - Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA - Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

[5]**Coefficient of Conservatism and Coefficient of Wetness** (Oldham et. al. 1995).

CC = Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

CW = Coefficient of Wetness. -Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.