

DATE: SEPTEMBER 25, 2012

TO: HONOURABLE MAURIZIO BEVILACQUA, MAYOR
AND MEMBERS OF COUNCIL

FROM: JOHN MACKENZIE, COMMISSIONER OF PLANNING

RE: COUNCIL ITEM – SEPTEMBER 25, 2012

C	<u>12</u>
Item #	<u>18</u>
Report No.	<u>33</u>
Council - <u>Sept 25/12</u>	

**IMPLEMENTATION MEASURES: VAUGHAN OFFICIAL PLAN 2010
APPROVAL OF TERMS OF REFERENCE AND AUTHORIZATION TO ISSUE RFP,
NATURAL HERITAGE NETWORK STUDY PHASES 2, 3 AND 4
FILE 25.1
REPORT 33, ITEM 18 - COMMITTEE OF THE WHOLE – SEPTEMBER 4, 2012**

The following recommendation was made at the Committee of the Whole meeting of September 5, 2012, regarding Item #18:

“2) That the following motion be referred to staff for review, and suggested wording as appropriate be provided to the Council meeting of September 25, 2012:

That in undertaking Phases 2, 3, and 4 of the Natural Heritage Study, consultants be guided by the following Council priorities:

- 1. Council’s ability to accommodate new or expanded infrastructure within the natural heritage network;**
- 2. The inclusion of publicly owned lands taking precedence over privately held lands as enhancement areas within the Natural Heritage Network; and**
- 3. Any review of the greenbelt by the City taking consideration of growth needs of the City.”**

Staff reviewed the Council Motion and are recommending changes to the Terms of Reference for Phases 2 to 4 of the Natural Heritage Network (NHN) Study to address the issues raised in the Council motion. The Terms of Reference articulates a systems-based approach to ecological stewardship which is formalized in earlier and current versions of the Provincial Policy Statement. This is consistent with current, science-supported best practices. To address the motion, additional emphasis on infrastructure studies including the City’s Transportation Master Plan and servicing plans is being added to the terms of reference.

Infrastructure

Section 2.6 of the Terms of Reference recognizes policy documents and master plan studies that are part of the City’s growth management strategy, Vaughan Tomorrow. A new subsection has been added to Section 2.6 of the revised Terms of Reference to describe the Transportation Master Plan. This follows a brief description of the Storm Drainage/Storm Water Management Master Plan, such that relevant City of Vaughan growth management and infrastructure policy documents and master plans are given appropriate consideration in the NHN Study.

Public Land

Section 3.3.iii of the Terms of Reference describes characteristics of a securement strategy to implement the NHN over time, including land stewardship options, partnerships considerations, and performance

monitoring considerations. It is noted in the first paragraph of this subsection that land "securement mechanisms should be tailored to the types of proposed NHN enhancements, such as in the Greenbelt Plan area, in the ORMCP area, reflecting main habitat types (e.g. riparian or woodland, etc.), open space linkages, and other relevant property and contextual information." It is appropriate to include an additional sentence as follows:

Preferred Enhancement Area options will complement or utilize public land where this can be supported based on ecological criteria.

Greenbelt Plan and Oak Ridges Moraine Conservation Plan Reviews

Section 1.4 of the Terms of Reference briefly describes emerging issues that are, in part, triggers for the NHN Study and include: the proposed GTA West (transportation) Corridor; a coordinated Secondary Plan for the New Community Areas; and the Provincial review of the Greenbelt Plan and the Oak Ridges Moraine Conservation Plan (ORMCP). The NHN Study, together with City master plan studies, will inform the City's input into the Provincial review of the Provincial Plan areas. As such, staff recommend adding the following at the end of Section 1.4 of the Terms of Reference:

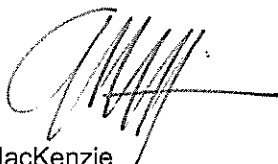
Any recommendations regarding the Greenbelt Plan and ORMCP will achieve an appropriate balance between economic, social and ecological considerations.

Recommendation

On this basis, it is recommended that Council adopt the following at this meeting:

The draft Terms of Reference for the undertaking of Phases 2, 3 and 4 of the Natural Heritage Network Study, forming Attachment 1 to this report and revised following the Committee of the Whole meeting of September 5, 2012, be approved and that staff be authorized to issue a Request for Proposal for the retention of the consulting services specified in the draft Terms of Reference.

Respectfully submitted,



John MacKenzie
Commissioner of Planning

Attachment – Natural Heritage Network Study – Draft Terms of Reference – Phases 2, 3 and 4.

- c. Clayton Harris, City Manager
Barbara Cribbett, Commissioner of Finance and City Treasurer
Jeffrey Abrams, City Clerk
Heather Wilson, Director of Legal Services
Andrew Pearce, Director of Development/Transportation Engineering
Roy McQuillin, Manager of Policy Planning

Ontario Regulation 293/11 – Redside Dace Regulations Under the ESA

Habitat Regulations under the ESA (2007) are summarized below.

The regulated habitat for Redside Dace protects elements of direct habitat including stream reaches where the species has been recorded within the past 20 years and in which the habitat is still suitable. Protected recovery habitat includes formerly occupied stream reaches in occupied or adjacent subwatersheds where there is a reasonable likelihood of successful stream corridor rehabilitation and natural recolonization. Protected indirect habitat includes the associated meander belt width plus vegetated areas or agricultural lands, within 30 metres of the meander belt for each occupied or recovery stream reach; protected indirect habitat also includes streams, headwaters drainage features, groundwater discharge areas or wetlands that augment or maintain baseflows, coarse sediment supply and surface water quality to occupied or recovery reaches where the average bankfull width of the respective occupied or recovery reach is less than or equal to 7.5 metres wide.

(Source:

<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/268554.html>).

Regulations under the Endangered Species Act for redside dace habitat are excerpted below.

Redside dace habitat

29.1 For the purpose of clause (a) of the definition of “habitat” in subsection 2 (1) of the Act, the following areas are prescribed as the habitat of redside dace:

1. Within the cities of Hamilton and Toronto, the counties of Bruce, Grey, Huron, Simcoe and Wellington, the regional municipalities of Durham, Halton, Peel and York, the Townships of St. Joseph, Jocelyn and Hilton, and the Village of Hilton Beach,
 - i. any part of a stream or other watercourse that is being used by a redside dace,
 - ii. any part of a stream or other watercourse that was used by a redside dace at any time during the previous 20 years and that provides suitable conditions for a redside dace to carry out its life processes,
 - iii. the area encompassing the meander belt width of an area described in subparagraph i or ii,
 - iv. the vegetated area or agricultural lands that are within 30 metres of an area described in subparagraph iii, and
 - v. a stream, permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality of a part of a stream or other watercourse described in subparagraph i or ii, provided the part of the stream or watercourse has an average bankfull width of 7.5 metres or less.
2. Within the City of Hamilton, counties of Bruce, Grey, Huron, Simcoe and Wellington and the regional municipalities of Durham, Halton, Peel and York,
 - i. any part of a stream or other watercourse used by a redside dace at any time in the past that is located in the same or adjacent sub-watershed as the area

- identified in subparagraph 1 i or ii that provides suitable conditions for successful stream corridor rehabilitation and for natural recolonization of reddsides,
- ii. the area encompassing the meander belt width of an area described in subparagraph i,
 - iii. the vegetated area or agricultural lands that are within 30 metres of an area described in subparagraph ii, and
 - iv. a stream, permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality of a part of a stream or other watercourse described in subparagraph i, provided the part of the stream or watercourse has an average bankfull width of 7.5 metres or less.

1. INTRODUCTION/PREAMBLE

The City of Vaughan is soliciting proposals from qualified consultants to undertake Phases 2 through 4 of the City's Natural Heritage Network (NHN). The City of Vaughan Official Plan 2010 (VOP 2010), adopted by the Council of the City of Vaughan in September 2010 and approved with modifications by York Region Council on June 28, 2012, designates a natural heritage system, the Natural Heritage Network (NHN), in Vaughan. The overall NHN Study will assess the role of the existing NHN in maintaining elements of biodiversity and ecological functions for the long term, consistent with Provincial Policy Statement (PPS) 2.1.2. At the completion of all phases of the NHN Study, additional NHN areas may be proposed to meet ecosystem targets of the natural heritage system related to biodiversity persistence and ecological function.

There are three main objectives of the overall NHN Study:

- An assessment of the biodiversity contribution and ecological functions of the existing NHN;
- Developing a GIS database of the NHN, its constituent parts, and relevant attribute information to provide a clear and transparent rationale for the NHN, which can be used in the development application process; and
- Prepare a strategy to enhance the NHN to meet select ecosystem targets.

The scope of the overall NHN Study has 4 phases of work. The first phase confirms the limits of the existing NHN by compiling all appropriate information into a comprehensive GIS database. Other key aspects of Phase 1 are to set ecosystem targets to complete the NHN and compare the existing NHN against the targets to understand the gaps in the system. Phase 2 of the study includes field investigations according to existing protocols, such as the *Significant Wildlife Habitat Technical Guide* (MNR 2000) and the *Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines* (CVC and TRCA 2009). Phase 3 summarizes the work of the first two phases into a report format. Furthermore, in reconciling the results of Phase 1 and the findings from the field investigations in Phase 2, it may be necessary in Phase 3 to refine ecosystem targets as well as re-evaluating the natural heritage gaps in the NHN. Phase 4 considers different land securement approaches and, hence, will provide a checklist of actions to enhance the NHN.

1. BACKGROUND

Phases 2 to 4 of the NHN Study will be conducted in the context of a well-established policy regime, which articulates the positions of the Province, York Region, the City of Vaughan, and the Toronto and Region Conservation Authority (TRCA). Section 2 of this Terms of Reference provides an overview of the policy framework. The Consultant will be expected to be familiar with the policies, standards and practices described in these documents and any others determined to be pertinent and to address them in the Study.

1.1. Provincial Policies

The Province of Ontario approved the Growth Plan for the Greater Golden Horseshoe (GGH) - Places to Grow in 2006. The Growth Plan sets out a vision for growth in the GGH to the year 2031. This includes a set of long-range growth forecasts and directions on how

growth should be accommodated and managed effectively. The land use policies of VOP 2010 must reflect and support this new planning policy environment.

The Growth Plan supports the role of municipal policy in providing leadership and innovation in developing a culture of conservation. The Growth Plan encourages planning authorities to identify natural heritage features and areas that complement, link, or enhance natural systems. Municipalities are encouraged to develop a system of publicly accessible parkland, open space and trails embedded in a natural heritage system as well as establish an urban open space system within built-up areas, which include rooftop gardens, communal courtyards, and public parks.

The Provincial Policy Statement (PPS) has a strong focus on the long-term prosperity and environmental health of Ontario. It states that natural features and areas shall be protected for the long-term (2.1.1). The PPS defines Natural Features and Areas as:

“features and areas, including significant wetlands, significant coastal wetlands, fish habitat, significant woodlands south and east of the Canadian Shield, significant valley lands south and east of the Canadian Shield, significant habitat of endangered species and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscapes of an area”.

The PPS also defines a Natural Heritage System as:

“A system made up of natural heritage features and areas, linked by natural corridors which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems. These systems can include lands that have been restored and areas with the potential to be restored to a natural state”.

The Greenbelt Plan contains policies for providing permanent agricultural and environmental protection as well as providing for a wide range of recreation, tourism and cultural opportunities in the area. The Protected Countryside is comprised of an Agricultural System and a Natural System, together with a number of settlement areas and is intended to improve linkages between these areas and surrounding systems. The Natural System identifies lands that support both natural heritage and hydrologic features and functions. The Greenbelt Plan recognizes that the Natural System extends beyond the boundaries of the Greenbelt and encourages connections between the Greenbelt's Natural System and the broader scale natural heritage systems of southern Ontario. Criteria have been identified to permit potential municipal requests to expand the Greenbelt.

The Oak Ridges Moraine Conservation Plan (ORMCP) is a fundamental component of the Greenbelt Plan. The Oak Ridges Moraine is an environmentally sensitive, geological landform in south central Ontario, covering 190,000 ha. It has a unique concentration of environmental, geological and hydrological features that make its ecosystem vital to south-central Ontario. The ORMCP identifies four categories of land use: Settlement; Countryside; Natural Linkage; and Natural Core. The latter two designations are the most restrictive, and provide the most aggressive goals for the protection of natural heritage.

The new Endangered Species Act (ESA 2007) is the first in Canada to combine mandatory habitat protection with a science-based approach to listing species for protection. Species thought to be at risk are assessed by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent body that reviews species based on the best available science, including community knowledge, and Aboriginal Traditional Knowledge. Once species are classified "at risk", they are added to the Species at Risk in Ontario (SARO) list in one of four categories. Endangered, threatened and extirpated species on this list automatically receive legal protection under the ESA 2007. Providing legal protection to threatened species is a change from the original Act which only applied to endangered species. Under the ESA 2007, it is legally required to protect direct and indirect habitat of endangered species. Habitat regulations under the Act are available for Redside Dace (Regulation 293/11), which is relevant to the NHN Study in Vaughan, and are provided in Appendix A of this RFP. This follows the release of the Recovery Strategy for Redside Dace in Ontario (February 2010) and the Draft Government Response Statement (September 2010). Recommendations to protect Redside Dace habitat in Section 2.5 of the Recovery Strategy for Redside Dace in Ontario are excerpted below.

It is recommended that all reaches (aquatic resource areas¹ as defined by OMNR) currently occupied by Redside Dace be regulated as habitat under the ESA 2007. Reaches in formerly occupied watersheds that have been targeted for restoration and where there is a high likelihood of successful habitat rehabilitation and repatriation of Redside Dace, should also be considered for inclusion in the regulation.

The integrity of headwater areas² upstream of reaches currently occupied³ by Redside Dace is also extremely important. Headwater streams, groundwater discharge areas and wetlands play an important physical role in augmenting and maintaining baseflows, coarse sediment supply and surface water quality, and the protection of headwater systems should be given a high priority in freshwater conservation efforts (Saunders et al. 2002). It is recommended that headwater streams, groundwater discharge areas and wetlands that physically support the reaches occupied by Redside Dace also be regulated as habitat of the species.

- 1 Aquatic Resource Areas are aggregations of stream segments with similar physical and biological characteristics.*
- 2 Headwater areas or features are small channels or depressions that directly influence the hydrology, sediment supply or food supply of flowing streams and rivers.*
- 3 Occupied based on a record within the past 20 years within the Aquatic Resource Area.*

Ontario's Biodiversity Strategy, 2011 (Ontario Biodiversity Council 2011) is the guiding framework for coordinating the conservation of Ontario's variety of life and ecosystems. The success of this Strategy will be tracked through 15 specific targets representing key areas of focus for biodiversity conservation in Ontario. The progress will be monitored and assessed over a 10-year time frame to encourage people across all sectors to take on actions that will ultimately lead to securing and maintaining Ontario's biodiversity. Several of the 15 targets refer directly to implementing natural heritage systems for biodiversity conservation, maintaining and enhancing ecosystem services, and reporting on the state of Ontario's biodiversity.

1.2. York Region Official Plan

The York Regional Official Plan (ROP 2010), approved by the Minister of Municipal Affairs and Housing on September 7, 2010, is the upper tier planning document that provides the framework for achieving the Region's urban structure. The ROP 2010 was subject to over 50 appeals and is now in the hands of the Ontario Municipal Board. The ROP 2010 received partial approval by the Ontario Municipal Board on July 11, 2012. Chapter 2, A Sustainable Natural Environment, was included in the partial approval. Mediation of portions of the Plan still under appeal is ongoing and an OMB hearing has been scheduled to commence on November 19, 2012 to address all unresolved issues.

Any amendments to the City's Official Plan must conform to the Region's Official Plan. The ROP 2010 recognizes the importance of integrating the objectives of the natural environment with those for healthy communities and economic vitality as outlined in its Sustainability Strategy (2007). The importance of maintaining and enhancing a healthy Regional Greenlands System is emphasized in the ROP 2010.

The policy framework has been greatly expanded to bring the plan into conformity with the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, the York Region Significant Woodlands Study (2005) among other important instruments that will affect the outcomes for the Greenlands System. The primary function of the Regional Greenlands System is:

"... the protection of natural heritage features in a system of cores connected by corridors and linkages. The Regional Greenlands System also provides opportunities for passive recreation in a future Regional Trails System such as hiking and nature appreciation. Urban uses and infrastructure projects should contribute ecological gains to the Regional Greenlands System through enhancement and restoration, and the strategic creation of natural habitat."

It is the intent that the Vaughan Natural Heritage Network (NHN) and supporting policies be consistent with the objectives identified in the ROP 2010.

1.3. Toronto and Region Conservation Authority

The province has delegated approval authority to the Toronto and Region Conservation Authority (TRCA) for the Natural Hazard section of the PPS. The TRCA also has a commenting role on development applications submitted to the municipality under the Planning Act for aspects of other water resource systems and natural heritage. They rely on four key instruments to guide their comments and permitting: the Terrestrial Natural Heritage System Strategy (2007); watershed plans; the Valley and Stream Corridor Management Program (1994); and Regulation 166/06 under the Conservation Authorities Act.

The objective of the TRCA Terrestrial Natural Heritage System (TNHS) is to identify and evaluate natural heritage features and functions within the landscape, for inclusion in a Natural Heritage System. The Humber River Watershed Plan and Don River Watershed Plan describe the TNHS for the respective watersheds and include implementation recommendations regarding land use, outreach and stewardship.

Watershed Plans are mandated under the Oak Ridges Moraine Conservation Plan. The Humber River Watershed Plan: Pathways to a Healthy Humber and the Implementation

Guide (2008) and the Don River Watershed Plan: Beyond 40 Steps and Implementation Guide (2009) provide guiding principles and objectives that support strategies and targets that include protecting and expanding the terrestrial natural heritage system, building sustainable communities and creating an enhanced regional open space system.

The TRCA's Valley and Stream Corridor Management Program outlines policies that seek to retain watercourses and valley and stream corridors as open, natural landforms, from the headwaters to the river estuary marshes. These policies guide the TRCA Planning and Development staff when reviewing applications under Ontario Regulation 166/06 and in commenting on land use planning policy documents and development applications.

Ontario Regulation 166/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, is the regulation under Section 28 of the Conservation Authorities Act that is specific to the TRCA. The main objectives of O.R. 166/06 are to ensure public safety and protect property with respect to natural hazards and to safeguard watershed health by preventing pollution and impacts to sensitive environmental areas such as wetlands, shorelines and watercourses.

1.4. Emerging Issues

i. GTA West Corridor

The release of the GTA West Draft Transportation Development Strategy Report in March 2011 provides an update of the scoping phase of the proposed GTA West Corridor. The next phase of work will include the more detailed Environmental Assessment, including an evaluation of specific route options. The GTA West Corridor is proposed to fragment one of three remaining biodiversity concentration areas in Vaughan, which is also in the Greenbelt Plan area.

Any potential loss of habitat is a significant impact on the existing NHN as only the remaining natural areas are protected in the NHN. That is, the natural heritage background report completed for the VOP 2010 did not consider restoration areas or ecological linkages to meet ecosystem targets. Only in a few specific sites are Enhancement Areas identified and these are primarily for the purposes of connectivity, but not to recommend potential significant restoration areas. The potential impact of a project of the magnitude of the GTA West Corridor emphasizes the need for a long-term plan for the NHN that includes identifying appropriate habitat enhancement and/or restoration areas.

ii. One Comprehensive and Coordinated Secondary Plan for New Community Areas

Policies in the ROP 2010 regarding New Community Areas support the preparation of one coordinated secondary plan process to efficiently address healthy communities and sustainability. Policy 5.6.11 of the ROP 2010 requires a master environmental servicing plan to examine all water systems in a comprehensive manner to minimize stormwater volumes and maximize water conservation. There is also an emphasis on maximizing infiltration through an integrated treatment approach. ROP 2010 policy 5.6.14 requires the preparation of a Greenlands System Plan that not only ensures protection of key natural heritage features, but also:

- identifies strategic areas for enhancement and restoration to maximize the quality of the entire System;
- identifies how infrastructure projects within the System contribute to an overall ecological gain by increasing natural cover, enhancing ecological function, providing recreational access or contributing to off-site enhancements;
- identifies securement opportunities and management requirements; and
- includes a trail system, which is integrated into the mobility systems of the community.

iii. Greenbelt Plan and Oak Ridges Moraine Conservation Plan Reviews

It is noted in Section 5.6 of the Greenbelt Plan that the "...10-year review of the Greenbelt Plan will be coordinated with the reviews of the Niagara Escarpment Plan and the ORMCP, which includes any adjustments necessary to align the timing of these reviews. " A 10-year review period for the Greenbelt Plan would be 2015. Hence, there is an opportunity for the City to provide evidence for the review purpose to "assess the effectiveness of the policies contained in the Plan (using information gathered through the monitoring program, and conducted through a public process), and make amendments, if appropriate, to update or include new information or improve the effectiveness and relevance of the policies. "

The potential loss and fragmentation of natural habitat in the Greenbelt Plan area as a result of the GTA West Corridor and the urban area expansion proposed in the New Community Areas will factor into the Greenbelt Plan review. As a result, options to maintain and/or improve the NHN in Vaughan must be evaluated and justified to provide input into the coordinated reviews of the Greenbelt Plan and the Oak Ridges Moraine Conservation Plan. Any recommendations regarding the Greenbelt Plan and ORMCP will achieve an appropriate balance between economic, social and ecological considerations.

2.5 Basis for Field Investigation Protocols

While particular emphasis for the field investigations is placed on evaluation of headwater drainage features and identification of areas of significant wildlife habitat, the methodology should consider the ecosystem targets identified in Phase 1 of the NHN Study. Related objectives that may influence the field investigation protocols are associated with legislation and/or initiatives including, but not limited to: the Ontario Stream Assessment Protocol (OMNR 2005); the Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines (CVC and TRCA 2009); the Humber River Watershed Report (TRCA 2008); the Don River Watershed Report (TRCA 2009); the Endangered Species Act (2007); and the Significant Wildlife Habitat Technical Guide (OMNR 2000).

The various targets, strategies and actions identified in the relevant planning documents, particularly the Humber River Watershed Plan and Don River Watershed Plan, essentially focus on a few key issues of relevance to the NHN Study:

- Conducting field investigations to identify appropriate areas to meet ecosystem targets such as (i) Enhancement Areas for biodiversity habitat and/or linkage areas and/or (ii) modifications to Core Features boundaries;
- Determining the amount of natural areas and open space area required to maintain biotic assemblages (e.g. fish and benthos regarding aquatic habitat), recharge rates and stream baseflow in areas identified for development;
- Identifying the location of natural areas, ecological restoration areas and/or open space areas to maximize benefits for overall watershed health whether in the form of appropriate riparian buffers (such as to counter effects of impervious cover) or contiguous habitat areas, such as to include important recharge areas or a concentration of headwater drainage features (i.e. "production areas");
- Identifying wetland restoration opportunities, such as to maintain stream form by mitigating erosion potential or for hydrological connections to improve habitat of target aquatic species;
- Identifying species conservation reserves consistent with the Recovery Strategy for Redside Dace (*Clinostomus elongatus*) in Ontario (Redside Dace Recovery Team 2010), such as where there are hydrological connections to direct and indirect habitat of Redside Dace or where protecting intervening lands can connect several reaches of direct or indirect habitat; and
- Given the importance of headwater drainage features in a watershed and to overall stream flow, provide a cumulative assessment approach to the evaluation of headwater drainage features and other watercourses.

i. Ontario Stream Assessment Protocol (OSAP)

The OSAP provides standardized methods for stream assessment to ensure data repeatability and allow data to be shared, used for multiple purposes, and stored in a common database. The OSAP document addresses a range of stream assessment issues, from very specific questions (e.g. determining maximum summer temperature) to broader issues (e.g. changes in fish community composition over time). The methodologies proposed by the Consultant should make reference to the appropriate OSAP modules.

ii. Evaluation of Headwater Drainage Features

Credit Valley Conservation (CVC) and the Toronto and Region Conservation Authority (TRCA) have provided a protocol for evaluating headwater drainage features in the document, Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines (CVC and TRCA 2009). The spatial extent of headwater drainage features can account for 70-80% of the total catchment area within a watershed. Furthermore, 90% of a river's flow may be derived from catchment headwaters. Headwater systems are considered important sources of food, sediment, water, nutrients, and organic matter for downstream reaches. However, due to their small size and because these functions are poorly understood and typically underestimated,

headwater drainage features can be vulnerable to impacts resulting from agricultural and urban land uses, such as tile drainage, channel lowering, relocation, and enclosure (i.e. piping). In March 2007, TRCA completed a literature review summarizing the state of the science around the natural functions of headwater drainage features. TRCA also conducted some primary research to further the understanding of these systems specifically with respect to quantifying drift (invertebrates and detritus) inputs to downstream aquatic habitats. The headwater evaluation guidelines (CVC and TRCA 2009) are based on this most up-to-date information.

While the evaluation and classification is undertaken at the site specific scale, the management recommendations should consider the cumulative effects on the drainage network. The management recommendations are to be implemented through the development design, including stormwater management and sustainable management practices, and must take into consideration the recommendations of the relevant Fisheries Management Plan (FMP) or Watershed Plans.

The sampling protocols in the headwater evaluation guidelines (CVC and TRCA 2009) are intended to be written as a module in the OSAP.

iii. Don River Watershed Plan (TRCA 2009)

The Don River Watershed Plan (TRCA 2009) identifies management and implementation strategies structured around three broad headings: Caring for Water, Caring for Nature and Caring for Community. Select actions and targets associated with relevant strategies are provided in Appendix A. The recommended actions excerpted from the Don River Watershed Plan in Appendix A focus on stormwater, groundwater, stream form and aquatic habitat.

iv. Humber River Watershed Plan (TRCA 2008)

The Humber River Watershed Plan includes 157 recommendations structured around 30 objectives and three broad categories (protect and expand the terrestrial natural heritage system; build sustainable communities; and recognize the distinctive heritage of the Humber through a regional open space system). Select actions and targets from the Humber River Watershed Plan (TRCA 2008) are provided in Appendix A.

v. Recovery Strategy for Redside Dace in Ontario

An excerpt from the Recovery Strategy for Redside Dace (*Clinostomus elongatus*) in Ontario (Reside Dace Recovery Team 2010) is provided in section 2.1 above that describes the regulated habitat under the Endangered Species Act (2007). The habitat regulations (Regulation 293/11) are provided in Appendix A.

It is the intent of the Ministry of Natural Resources to provide habitat mapping consistent with Regulation 293/11 (i.e. meander belt plus 30 metres for direct and indirect habitat), although not necessarily at the level of detail of a regulation limit. Nevertheless, the distribution of Redside Dace habitat according to MNR data in relation to other natural features and the ecosystem targets identified in Phase 1 is a critical consideration in the design of a functioning natural heritage system.

vi. Significant Wildlife Habitat Technical Guide

The *Significant Wildlife Habitat Technical Guide* (OMNR 2000) is a technical manual that provides information on the identification, description, and prioritization of significant wildlife habitat. The manual is intended for use by ecologists, biologists, environmental planners, and others involved in the development of strategies to identify and protect significant wildlife habitat in the municipal planning process. It should be read in conjunction with the PPS and the Natural Heritage Reference Manual (OMNR 2010). In particular, it is the direction of the Province that special concern species identified under the ESA on the SARO List are addressed through the determination of Significant Wildlife Habitat (OMNR 2010). These species were formally referred to as “vulnerable” in the Significant Wildlife Habitat Technical Guide.

Significant wildlife habitat has been divided into four broad categories:

- seasonal concentration areas;
- rare vegetation communities or specialized habitats for wildlife;
- habitats of species of conservation concern, excluding the habitats of endangered and threatened species; and
- animal movement corridors.

It is noted in the technical guide that the task of identifying significant wildlife habitat will be facilitated if other natural heritage features are mapped first as outlined by the Natural Heritage Reference Manual and the appropriate technical manuals. Many known, as well as unknown, wildlife habitats exist in these other reference areas. Significant wildlife habitat that is found in other natural heritage features is very important and should be identified. However, as a priority, surveys should concentrate on areas outside identified features. It will save time and be more efficient to concentrate on areas not included in other natural heritage features and areas.

The technical guide does not advocate that planning authorities conduct exhaustive searches within their jurisdiction to find “everything.” The methods suggested in the guide are intended to focus searches in the most likely sites at the right time of year. By including potentially significant habitats that have not been previously identified and mapped, future work may be conducted on the most likely sites. For example, there may be regular sightings of rare species in the planning area, but the location of critical components of their habitat may be unknown. Until these sites are found and protected either as significant wildlife habitat or part of a larger protected area, the long-term sustainability of these species is not assured. Hence, for the City of Vaughan NHN Study, it will be important to determine a short list of potential areas of significant wildlife habitat in order to identify priority sites for field investigations.

2.6 Relevant Vaughan Policy And Master Plans**i. Vaughan Official Plan: A Plan for Transformation**

Building on the Strategic Plan, *Vaughan Vision 2020*, and *Green Directions Vaughan*, the VOP 2010 is the largest single policy document emerging from *Vaughan Tomorrow*. Its significance is heightened because an approved official plan has statutory authority

and its influence extends into all other planning approvals, e.g. subdivisions, site plans and zonings. The VOP 2010 and master plans carry forward the principles of *Green Directions Vaughan* and the new planning policies will help secure the City's green policy transformation. Specific aspects of the new Official Plan of note include:

- demonstrating leadership through green building and urban design policies (Section 9.1);
- protecting green space and countryside by establishing a Natural Heritage Network and limiting urban expansion;
- intensification areas and corridors in 4% of the land base to promote transit and active transportation, as well as reduce commuting distances through better live-work relationships;
- higher density mixed use communities in the Vaughan Metropolitan Centre and other Primary and Local Centres, together with an emphasis on complete communities and design excellence, to foster vibrant communities; and
- an overall vision and policy structure that supports implementation of Green Directions Vaughan.

ii. Green Directions Vaughan (Community Sustainability and Environmental Master Plan)

Green Directions Vaughan is the City's Community Sustainability and Environmental Master Plan (CSEMP). It influences virtually all aspects of the City's operational and regulatory activities, including the growth management strategy. The plan establishes the principles of sustainability to be used in the development of other plans and master plans to achieve a healthy natural environment, vibrant communities and a strong economy.

Green Directions Vaughan provides two distinct functions: (1) it creates a series of sustainability action plans to guide the City's operational and regulatory functions; and (2) it acts as the City's first Integrated Community Sustainability Plan. The process to develop *Green Directions Vaughan* began in October 2007 and concluded in early 2009 with its adoption by Council. It involved a number of conversations and a series of consultations with citizens, stakeholders, partners, staff, and Council.

Green Directions Vaughan includes a series of recommended actions that span the entire sphere of municipal responsibility, including operational and regulatory functions. A specific action item directs the City to develop sustainability guidelines for use in the development review process. The complete plan is available at <http://www.vaughtantomorrow.ca/EMP/index.html>.

iii. Natural Heritage in the City – Background Report

As part of the development of VOP 2010, AECOM was retained under subcontract to Urban Strategies Inc. to undertake additional background research and analysis in

preparation of the new growth management plans. The report, "Natural Heritage in the City", addresses environmental protection so as to direct future growth in population and housing to appropriate lands.

The report, Natural Heritage in the City, provides the preliminary analysis and support to delineate the City of Vaughan's first Natural Heritage Network (NHN). Environmental policies in Chapter 3 of the City of Vaughan Official Plan address the support and enhancement of the Natural Heritage Network. Additional studies are identified and recommended in a Report to Council (Committee of the Whole) of June 1st, 2010 to complete the Natural Heritage Network by recognizing biodiversity targets within an urban municipality.

iv. Storm Drainage/Storm Water Management Master Plan

The Storm Drainage/Storm Water Management Master Plan is being undertaken concurrent with the Master Plan for water and wastewater infrastructure. Both Master Plan studies will be conducted in accordance with the Master Plan process as outlined in the *Municipal Engineers Association Municipal Class Environmental Assessment* document (October 2000, as amended in 2007). The Master Plan Class Environmental Assessment (EA) process includes public and review agency consultation, an assessment of the problem and opportunities, evaluation of alternative solutions, assessment of potential effects on the environment, and identification of reasonable measures to mitigate any adverse effects. The preferred solution(s) will be determined based on engineering requirements, environmental considerations, public input and information gathered during the studies.

Specific consideration of the Storm Drainage/Storm Water Management Master Plan include, but are not limited to:

- A broad level analysis of emerging groundwater management issues;
- Review and recommendations to incorporate low impact development guidelines into the storm drainage and stormwater management criteria;
- Development of stormwater servicing options for growth scenarios; and
- Consideration of alternative servicing solutions to address integrated objectives and environmental targets to accommodate future growth.

Related infrastructure studies are also noted below.

- VMC Black Creek Renewal Class EA Study - The EA Study, to be completed in 2013, will identify the preferred preliminary design, channel alignment, road crossing improvements and property requirements for the proposed Black Creek channel improvements. An integrated design team is involved in the VMC Black Creek Renewal EA to incorporate urban design and open space elements.
- Rainbow Creek Subwatershed Update – To be completed in late 2012, the study is an update to the master drainage plan for the Rainbow Creek in order for the

City to develop and implement a regeneration plan. This will not only improve the environmental conditions within the creek and valley stream, but will provide reasonable protection against accelerated erosion rates and flooding while protecting municipal infrastructure and property.

The NHN Study will also consider the Regional Master Plans for water/wastewater and transportation.

v. City Transportation Master Plan (New Path)

Vaughan Council approved the City's new Transportation Master Plan (TMP) in October 2011. The TMP is the City's transportation 'blueprint'. It will assist with addressing growth in a sustainable manner through to 2031. It has been prepared in response to the Provincial Growth Plan for the Greater Golden Horseshoe Area and is a key component of the City's Growth Management Strategy (Vaughan Tomorrow) and new Official Plan. The TMP sets out the framework for managing the travel demands of the existing and future residents and businesses in Vaughan. The main components of the TMP focus on a mix of transportation solutions including a transit first approach, improved active transportation, strategic road improvements, reduction in car use where possible, parking management, mobility choices for new development, and enhanced infrastructure in the Vaughan Metropolitan Centre.

3. THE STUDY

3.1. Purpose / Goal

The overall study will assess the role of the existing NHN in maintaining elements of biodiversity and ecological functions for the long term, consistent with PPS 2.1.2 and York Region policies regarding greenlands systems. At the completion of all phases of the NHN Study, additional NHN areas may be proposed to meet ecosystem targets of the natural heritage system related to biodiversity persistence and maintaining ecological function. The result is a long-term plan for the NHN to achieve the ecosystem targets through a variety of site securement strategies.

Based on review of existing natural heritage system plans and select Ontario Municipal Board cases, successful natural heritage system strategies have the following characteristics, which will form the basis for this study:

- clear criteria and a transparent process;
- a systems-based approach to ecological stewardship consistent with current best practices;
- maintenance and enhancement of connections between natural features as a legitimate goal consistent with the PPS; and
- decision-rules regarding the development of a natural heritage system that attempt to achieve proper balance between protecting the natural environment, fostering economic competitiveness and fostering a healthy, equitable society.

Phase 1 of the NHN study has a focus on (a) providing further mapping and attribute detail of the NHN in a GIS database, including refining the criteria to justify the NHN boundaries and (b) identifying biodiversity and ecological function targets for the NHN to maintain for the long-term. Phase 2 of the overall study includes field investigations with a focus on evaluating significant wildlife habitat and headwater drainage features. Subsequent phases will report on the results and provide site securement options and/or management strategies (e.g. meadow or prairie habitat requires mimicking natural disturbance to maintain these habitat types) for various components and elements of the NHN.

This RFP addresses Phases 2 to 4 of the overall Natural Heritage Network Study.

3.2. Objectives

There are three main objectives of the overall NHN Study:

- An assessment of the biodiversity contribution and ecological functions of the existing NHN;
- Developing a GIS database of the NHN, including relevant attribute information, to provide clear and transparent rationale for the NHN, which can be used in the development application process; and
- Prepare a strategy to enhance the NHN over time to meet select ecosystem targets.

3.3 Study Components

There are four main components of the scope of work: (i) Phase 2 field investigations; (ii) Phase 3 summary, recommendations and reporting; (iii) Phase 4 securement strategy; and (iv) the overall consultation process. The description below is a guide to the elements of the work plan and is not an exhaustive list of tasks.

i. Phase 2 – Field Investigations

Phase 2 of the NHN Study has four main components.

a) Phase 1 Review

Review the structure of the updated GIS database of the NHN information to recommend additional attribute information that may need to be collected during the field investigations.

Review the ecosystem targets to determine if field investigations should include additional study themes beyond significant wildlife habitat and evaluation of headwater drainages features.

Identify priority sites for field investigations based on the gap assessment completed in Phase 1 (i.e. gaps between the biodiversity contribution of the existing NHN and the selected ecosystem targets).

Identify priority sites for field investigations to augment existing field data related to significant wildlife habitat and headwater drainage feature evaluations.

Identify priority sites for field investigations which may be subject to more immediate development pressure.

b) Evaluation of Significant Wildlife Habitat

Conduct a scan of the evaluation process and criteria in the Significant Wildlife Habitat Technical Guide (OMNR 2010) to:

- “confirm” significant wildlife habitat based on available information (e.g. existing ANSIs and ESAs);
- identify priority areas for field investigations to evaluate significant wildlife habitat; and/or
- identify “adjacent” lands to “confirmed” or “candidate” significant wildlife habitat.

Identify “candidate” significant wildlife habitat according to the Significant Wildlife Habitat Technical Guide and Section 9 of the Natural Heritage Reference Manual (OMNR 2010):

- Habitats of seasonal concentrations of animals;
- Rare vegetation communities or specialized habitats for wildlife (with particular emphasis on woodlands with cavity nesting trees, area-sensitive forest and grassland species, amphibian woodland breeding ponds, and seeps and springs);
- Habitats of species of conservation concern (Note that this includes special concern species identified under the Endangered Species Act on the SARO List, which were formally referred to as “vulnerable” in the Significant Wildlife Habitat Technical Guide, and species identified as nationally endangered or threatened by the Committee on the Status of Endangered Wildlife in Canada, which are not protected in regulation under Ontario’s Endangered Species Act; and
- Animal movement corridors.

Determine field investigation procedures to verify or to identify “candidate” significant wildlife habitat.

Confirm significant wildlife habitat based on the additional field investigations.

Provide a discussion of requirements regarding adjacent lands to significant wildlife habitat, such as to ensure long-term persistence of significant wildlife habitat that may influence the boundaries of Core Features and/or Enhancement Areas, or to demonstrate no adverse impacts as required in an EIS.

c) Evaluation of Headwater Drainage Features

Identify priority stream and headwater reaches for field investigations based on criteria to be developed by the successful Consultant, with review and direction from the Steering Committee.

Describe the proposed methodological approach, including a possible scaled approach, to watercourse and headwater drainage feature assessments. This may include such techniques as:

- Historic assessment of planform adjustments, such as through analysis of aerial photos;
- rapid assessment techniques, such as Rapid Geomorphic Assessment (RGA) and RSAT (Galli 1996);
- detailed field investigations using standard protocols; and
- drainage density targets on a subcatchment basis.

Determine any required modifications to stream assessment protocols in order to integrate the various objectives of the Don River and Humber River watershed plans, findings of the Source Water Protection Committee (e.g. Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas), and regulations for Redside Dace protection and recovery under the Endangered Species Act. This may be related to, for example, implementing a cumulative assessment approach (see below) or to implement select management and/or research approaches for maintenance and/or rehabilitation of Redside Dace populations and habitat (see Tables 6, 7 and 8 of the Recovery Strategy for Redside Dace (*Clinostomus elongatus*) in Ontario).

Implement a cumulative assessment approach to identify protection and/or restoration of hydrologic connections related to baseflow, recharge and discharge areas, wetland function, wetland restoration or other “valued ecosystem components” (VECs). Consideration should be given to existing monitoring efforts, such as the Southern Ontario Stream Monitoring and Research Team (SOSMART), so that the data from field investigations can be integrated into a larger regional data set. Cumulative assessment approaches include, but are not limited to:

- a spatial analysis to identify (i) areas of high biodiversity that are sensitive to development, (ii) priority areas for restoration (cusp of a threshold), (iii) areas with low resiliency to pulse stresses (e.g. climate events above a threshold), and/or (iv) drainage density;
- landscape modeling with a focus on priority VECs to quantify existing and potential future conditions relative to a reference state (for example, see the use of a predictive fish assemblage model in Stanfield 2012);

- evaluation and ranking of stream reaches and/or stream segments within the context of natural landscape variables (e.g. catchment surficial geology, baseflow contributions and stream slope), provision of fish habitat, and anthropogenic modifications to the watershed (e.g. percent impervious cover, number of stream crossings) to determine appropriate management considerations (i.e. protect in the NHN or maintain the function of the stream reach and/or segment); and
- evaluation of reach data and/or drainage density within the context of protection policies (Greenbelt Plan, ORMCP, Regional Greenlands System).

Conduct stream and headwater reach assessments according to the documented and/or revised protocols. Any proposed modifications to standard protocols should be reviewed by the Steering Committee.

Utilize the information to inform the discussion of impact thresholds generally and specifically to maintenance and recovery of Redside Dace populations and other target species noted in the Humber River Watershed Plan and Don River Watershed Plan.

d) Other Priority Field Sites

Consider potential future impacts to the NHN to identify any additional priority field sites beyond significant wildlife habitat and evaluation of headwater drainage features. Potential future impacts include, but are not limited to, the proposed GTA West Transportation Corridor, cumulative development in the New Community Areas (Blocks 27 and 41), the Hwy 400 North Employment Area and the West Vaughan Employment Area.

ii. Phase 3 – Summary, Recommendations and Reporting

Summarize the findings of the background research and field investigations in relation to confirmed and candidate significant wildlife habitat, and long-term maintenance of significant wildlife habitat.

Summarize the findings of the background research and field investigations in relation to the stream and headwater drainage features evaluation and cumulative assessment approach.

Identify and quantify potential future impacts to the existing NHN and to meeting the ecosystem targets selected in Phase 1. Potential future impacts include the proposed GTA West Transportation Corridor, cumulative development in the New Community Areas (Blocks 27 and 41), the Hwy 400 North Employment Area and the West Vaughan Employment Area. Consideration should be given to Master Plans recently completed or underway, such as the Storm Drainage/Stormwater Management Master Plan. Potential impacts should also be framed in the context of the Greenbelt Plan and Oak Ridges Moraine Conservation Plan and the upcoming 10-year review of these Provincial plans.

Modify ecosystem targets, if needed, based on the additional information from the field investigations to present the final ecosystem targets for the NHN.

Specify additions to the NHN to meet the recommended ecosystem targets to improve long-term maintenance of the biodiversity elements and ecological functions based on the field investigations and other research in Phase 2. Recommendations to enhance the NHN should be as quantitative as possible (e.g. specifying the amount of interior forest to add to the existing largest forest blocks) and be delineated spatially as Enhancement Areas or recommended changes to Core Features of the NHN (e.g. key population dispersal route, animal migration corridor, or specific stream reaches requiring enhanced riparian protection):

- Provide a map of the recommended NHN in which the best options are identified to meet ecosystem targets as part of a connected natural heritage system.
- NHN options or scenarios may need to be identified if there are multiple approaches to meeting ecosystem targets or if there are priority options based on other factors such as feasibility of implementation.

Summarize the likelihood of biodiversity and ecosystem function persistence. Provide key summary statistics of the recommended complete NHN with respect to land area, stream order, habitat composition, key or indicator species populations expected to be maintained and key or indicator species populations expected to recover.

Compare the NHN Study results against the Natural Heritage System checklist in the Natural Heritage Reference Manual (OMNR 2010) and determine additional actions relevant to Vaughan that may need to be undertaken in this Study or as a recommendation for further study.

Summarize connections of the NHN to related City of Vaughan goals, such as for an open space network and trails as defined in documents such as the Active Together Master Plan (Parks, Recreation, Culture and Libraries Master Plan) and the Pedestrian and Bicycle Master Plan Study.

Provide critical management considerations for lands outside of the NHN, such as related to impervious surfaces, intensity of adjacent land uses, and best practices for new infrastructure or infrastructure improvements. Specific management considerations for adjacent lands to the NHN may need to be limited to key parts of the NHN, to be determined in discussion with the Steering Committee, such as the population strongholds for target aquatic species and critical recovery/restoration areas for species at risk.

iii. Phase 4 - Securement Strategy

A range of land securement options must be determined to implement the NHN over time to meet ecosystem targets and complete the natural heritage system. Securement approaches may include actions such as acquisition, conservation easements, land donations, agri-environment stewardship systems, Environmental Farm Plans, restoration incentives, education and stewardship promotion. Land securement mechanisms should be tailored to the types of proposed NHN enhancements, such as in the Greenbelt Plan area, in the ORMCP area, reflecting main habitat types (e.g. riparian

or woodland, etc.), open space linkages, and other relevant property and contextual information. Preferred Enhancement Area options will complement or utilize public land where this can be supported based on ecological criteria.

Identify potential public, private and/or international partnerships suited to the various securement approaches. Partnerships may include securement approaches, for example, related to site-specific stewardship and restoration or general education, conservation advocacy, funding, and other aspects of the stewardship strategy.

The securement strategy should be structured to reflect elements of a monitoring program and performance indicators, such as consistent with policy 4.11 of the PPS and performance monitoring related to the Greenbelt Plan.

Implementation of the securement strategy is a separate cost from the budget for Phases 2 to 4 of the NHN Study. The securement strategy should include cost estimates for implementation options.

iv. Consultation Process

Effective consultation is a key element of success by ensuring a transparent process and community input. The Consultant will identify participating stakeholders (e.g. residents, ratepayer groups, Aboriginal organizations, environmental organizations, and the builder/developer community).

The Consultant will determine stakeholder input for key milestones of the NHN study, such as:

- Overall NHN study objectives and ecosystem targets;
- Field investigation protocols;
- Integrating Phase 1 and Phase 2 results;
- Recommended NHN Core Features and Enhancement Areas to meet ecosystem targets;
- Securement strategy and monitoring implementation.

The consultation process proposed by the Consultant will integrate and build on the findings of the Public Consultation Meetings and other consultation undertaken as part of Phase 1.

4. DELIVERABLES

4.1 Consultation Process

- Develop and implement a consultation process that meets the test of a transparent process with clear criteria.

- Provide the City with a minimum of 3 Community Information Newsletters. See Section 8 for more detail on the Consultation Process.

4.2 Work Program for Phase 2 Field Investigations

- Finalize and document the approach to conducting the field investigations, including selected field sites, related to significant wildlife habitat, headwater drainage features, and other priority themes.

4.3 Interim Report for Phase 2 Field Investigations

- Documented methodology and results of the field investigations related to significant wildlife habitat, headwater drainage features, and other priority themes.
- Preliminary recommended changes to the NHN, either in terms of Core Features and/or Enhancement Areas boundary modifications and/or new Enhancement Areas, resulting from the field investigations.
- Description of the cumulative assessment approach to headwater drainage feature and stream assessments and the resulting recommendations regarding the NHN and other open space options.

4.4 Revision of Phase 1 Results

- Document any changes to the ecosystem targets developed in Phase 1 as a result of findings in Phases 2 and 3 and the consultation process.
- Where relevant, revise and/or finalize the decision rules and criteria for determining the NHN boundaries pertinent to conformity issues and meeting ecosystem targets identified in Phase 1.
- Where relevant, revise the GIS database of NHN layers and/or attribute information based on the findings in Phases 2 and 3.

4.5 Phase 3 and Phase 4 Reports

- Provide a Draft Comprehensive Report integrating the results of all phases of the NHN Study leading to the recommended Natural Heritage Network:
 - Overall NHN study objectives and ecosystem targets;
 - Field investigation protocols and results, including a cumulative assessment approach to streams and headwater drainage features;
 - A map of the final NHN in which the best options are identified to meet ecosystem targets as part of a connected natural heritage system;
 - Discussion of how the recommended NHN maintains biodiversity and ecological functions consistent with Section 2.1.2 of the PPS and conformity with other over-arching policies such as the York Region Official Plan, Endangered Species Act, Greenbelt Plan, Oak Ridges Moraine Conservation Plan, etc ;

- Discussion of how the recommended NHN addresses strategies and actions in the Don River Watershed Plan and Humber River Watershed Plan;
 - Discussion of how the NHN options also address the emerging issues identified in section 2.4, such as: potential fragmentation from the proposed GTA West Transportation Corridor; key areas of input for the 10-year review of the Greenbelt Plan and Oak Ridges Moraine Conservation Plan; and key areas of input into the secondary plan for the New Community Areas; and
 - A draft securement strategy and approach to monitoring implementation.
- Provide any further recommendations to those identified in Phase 1 to modify the Environmental Management Guideline to better align with the components of the NHN. This shall consider (a) the attribute information developed as part of the GIS database in Phase 1, (b) the tests and criteria as the basis of the NHN boundaries, and (c) strengthening the NHN as a connected system in relation to the identified ecosystem targets.
 - Provide a Final Comprehensive Report following consultation and review by City staff of the Draft Comprehensive Report. The Final Comprehensive Report will include an implementation strategy to bring the results of the NHN Study to Council for adoption.

5. PROJECT ADMINISTRATION

The study will be administered by a Project Coordinator and a Steering Committee which will be made up of staff representatives from various City of Vaughan departments (e.g. Development Planning, Parks Development, ITM, Parks and Forestry) as well as external agencies (Ministry of Natural Resources, York Region, and the TRCA). The Project Coordinator will be responsible for day-to-day contacts and operations. The Project Coordinator and the Steering Committee will perform the following functions:

- Conduct the consultant selection process;
- Making recommendations to Senior Management:
 - On consultant selection;
 - Final approval of the work plan;
 - The approval of the final reports.
- Project oversight;
- Provision of departmental information and support to the Consultant as it respects their individual mandates;
- Attending meetings with the Consultant to hear status updates and to provide input on policy development; and
- Review and comment on draft versions of the required study reports.

6. THE CONSULTANT

The term “Consultant” in the Terms of Reference also means “Consulting Team” and includes any combination of individuals, firms, companies or corporations party to the Proposal.

The Consultant will appoint a senior professional to be the City’s main contact and who will be responsible for the coordination of all consulting resources retained under the accepted Proposal. In the case that the Consultant is a consortium of companies, the Consultant Team Leader and Lead Firm will be responsible for invoicing the City and the disbursement of fees to the sub-consultants. Any changes or substitutions to the consulting team, subsequent to the submission of the Proposal, will require the written approval of the City of Vaughan.

7. QUALIFICATIONS

The successful Consultant will be required to bring multi-disciplinary expertise and experience to the project. Demonstrated expertise will be expected in the following areas:

- Natural heritage system design;
- Land use planning/regulation and the development review process;
- Geographic Information Systems, database design and spatial analysis;
- Preparation of environmental impact studies (EIS) and/or Master Environment Servicing Plans;
- Ecological expertise (e.g. ecology, biology, geography or environmental science) ideally with a specialization in landscape ecology or conservation biology;
- Hydrology expertise;
- Flora, fauna and abiotic survey and/or field investigation expertise;
- Experience in the use of the Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines (CVC and TRCA 2009) will be considered an asset; and
- Consultation and facilitation.

8. THE CONSULTATION PROCESS

Effective consultation will be essential to the success of this initiative. The Consultant is expected to develop a consultation plan that meets the test of a transparent process with clear criteria.

It is expected that the consultation process will include the following elements:

- Presentations to Senior Management/Council/Committees of Council at main milestones;

- A public and stakeholder consultation process, in accordance with an approved work plan, with the following parties:
 - Members of Council;
 - City Staff/Departments;
 - External Agencies;
 - The Public – Meetings and Presentations.

The City shall be provided with a minimum of 3 Community Information Newsletters that will provide background information, a project status update, next steps and any other related materials such as mapping/diagrams or project contact information during the course of the project.

All materials shall be provided by the Consultant in high resolution PDF and printable in a form of a newsletter and webpage.

The details of the consultation process will be established in the finalized work plan, which is referenced in Section 9 “Timing”.

9. TIMING

The targeted completion for Phase 2 to 4 of the NHN study is the first quarter of 2014, or approximately 15 months from the date of the selection of the recommended consultant.

Prior to commencing work on the project, the consultant will submit for the approval of the Steering Committee a finalized work plan, which will assign dates to the completion of various milestone tasks on the timeline. No chargeable work shall commence prior to the approval of the finalized work plan and the City of Vaughan shall not be responsible for any costs associated with its finalization.

10. CONTENT OF PROPOSALS

The consultant will be retained on the basis of a written proposal and, if necessary, interviews held by the Steering Committee or a sub-committee thereof. Selected Proponents may be short listed for interviews. See Section 12.

The written Proposal will be evaluated on the basis of the following information.

10.1 Consultant Profile

The principal Consultant is required to provide the following information related to its own organization and the consulting firms (if any) with whom it has formed a strategic partnership.

- Company history and organization;
- Office location(s);
- Description of company’s qualifications and experience in undertaking projects related to the NHN Study (see Section 7);
- Experience in similar studies;
- Level of public sector experience;
- Experience in multi-disciplinary teams;

- Demonstrated success in public/stakeholder consultation; and
- The Consultant's Principals must be involved and therefore may be requested to meet with key City staff prior to final award.

The Consultant or consulting team should provide a brief description (no more than one page per project) of sample natural heritage system projects with emphasis given to projects of similar size.

10.2 Consultant Resources

Consultants are to identify with their proposal submission all resources that are being proposed for the assignment. Proposed resources should be identified by the role to which they would be assigned. Please include the following information for each proposed resource:

- a) A project team organization chart describing the project team structure and identifying key personnel relationships and interface with the municipality, including identifying the Consultant Team Leader;
- b) Designation of the resources who would be assigned to work, together with details regarding the role they would play and their resume, which should include descriptions of related completed assignments, qualifications, relevant experience and any skill sets required for or that may be an asset;
- c) Location from which the resource would be traveling;
- d) Identification of supervisory/management personnel assigned for quality assurance;
- e) A description of available support staff and firm resources that may be required for this engagement;
- f) Details of any sub-consultants to be used in this assignment, including graphic design firms; and
- g) Provide a breakdown of each team member with their assigned tasks and the number of hours of work for each assigned task.

There shall be no substitution of personnel without prior written approval of the City of Vaughan's Project Coordinator.

10.3 References

Consultants must demonstrate an ability to provide consulting services for municipalities and are requested to provide a minimum of three (3) references, preferably from a public/municipal sector, where services of similar size and scope have been provided in the last five years and/or are currently being provided. References shall include:

- (a) Name of client organization, contact name, title, address, telephone number, and email address;

- (b) Brief description of the services provided, including duration and size of the services, with preference given to consultants or consulting team that describe services related to the preparation of natural heritage system strategies in the Greater Golden Horseshoe Area.

If the Consultant supplies a City Employee or Department as a reference, a decision may be made not to use that resource as a Reference and the City may request a substitute reference from the Consultant in order for the Bid to be considered further. Consultants should ensure that any references being provided have been notified of their inclusion as a reference prior to the closing of this RFP and should ensure that inclusion of any reference will not cause any Conflict of Interest on the part of the City's resources.

References that do not include the required details and contact information as outlined above will be deemed incomplete and will be considered as such for evaluation purposes.

In the proposal, the Consultant shall indicate the number and type of projects it is currently undertaking which may represent a professional conflict with the conduct of this study. Refer to Item 28 Document I "Conflict of Interest".

10.4 Proposed Approach and Methodology

The Proposal shall include a study approach and methodology, which shall include at a minimum, a description of the Consultant's understanding of the scope of work contained in this RFP, a study approach and methodology to successfully complete each task, and value added to the municipality.

The following components should be included in the proposed approach and methodology.

- a) Understanding of the project requirements including an explanation of the proposed approach which illustrates a comprehensive systems approach to natural heritage planning. The proposal should include a description of the basic sampling approaches to rapid assessments and/or detailed field investigations relating to key aspects of the project, such as surface water flows and quality, groundwater flows, stream morphology, flora, fauna, etc. The description of sampling approaches should also include references to existing and/or recommended long-term monitoring and/or control sites.
- b) An overview of how the deliverables will be produced.
- c) An allocation of resources by project phases.
- d) A description of any aspect of the Consultant's methodology, tools or techniques that they consider to be innovative, or that will enable the work to be carried out more effectively and efficiently; and
- e) A component(s) of the work effort considered by the Consultant to be value added.

10.5 Work Schedule

The Consultant must demonstrate the capacity to complete the work within the time and budget parameters outlined in this RFP. The City reserves the right to modify specific target dates and to reject any or all submissions or to cancel or withdraw the RFP for any reason without incurring any cost or liability for costs and damages incurred by any Consultant, including without limitations, any expenses incurred in the preparation of the submission.

The Work Schedule must include:

- a) A Work Schedule organized by key tasks and milestones in the form of an illustrated GANTT chart;
- b) The steps and timing through which the Deliverables will be produced;
- c) Task sequences and dependencies, milestones and key events;
- d) Meeting and consultation schedules, based on the timeline and requirements identified in Section 9 (Timing);
- e) A summary of risks/problems/issues associated with the work and how they will be mitigated; and
- f) An estimated overall timeline of the Services, including an indication of how soon the respondent can commence work and identifying key dates for major deliverables.

Prior to commencing work, the successful proponent will meet with the Project Coordinator/Steering Committee to finalize the work schedule.

10.6 Cost

The Consultant will provide an upset cost for the completion of the project, which includes a breakdown of the hourly rates attributable to each of the Consultant Team members and the time commitment by task, for each of the participants; and all other taxes, costs and related disbursements.

In addition to the Original, ten (10) bound copies of the Proposal, in an 8 1/2" X 11" format plus one (1) unbound print ready copy shall be submitted. The maximum length of the Proposal shall be fifteen (15) pages, exclusive of resumes, references and documentation relating to project experience.

11. EVALUATION CRITERIA

The Proposal will be evaluated on the basis of the criteria summarized below and described in Section 10:

Consultant Profile and Consultant Resources:

45%

- Capability of the Consultant Team Leader;
- Degree of Participation of the Consultant's senior staff;
- Qualifications and expertise of the team members;
- Project team organization chart and designation/allocation of resources (i.e. breakdown of each team member with their assigned tasks and the time commitment for each assigned task);

- Experience in similar studies;
- Level of public sector experience;
- Experience in multi-disciplinary teams;
- Demonstrated success in public/stakeholder consultation.

Proposed Approach and Methodology:**35%**

- Complete and comprehensive submission, with emphasis to the proposed methodology;
- Demonstrated understanding of the project requirements, with emphasis to the expected deliverables;
- Appropriate commitment of resources by project phases and/or components;
- Introduction of innovative ideas and concepts;
- Skill in communicating the project plan; and
- Value added.

Work Schedule:**10%**

- Work program and scheduling of major milestones and meetings;
- Steps and timing for Deliverables;
- Ability to commit to the timing objectives for the completion of the study.

Financial:**10%**

- Proposal Fee;
- Approach to reporting and invoicing, and monitoring of the budget.

12. SHORT-LIST DISCUSSIONS/INTERVIEWS/PRESENTATIONS REQUIREMENT

The City may create a short list of Proponents based on the evaluation results. The Short listed Proponents may be further evaluated on a score of 25.

The City reserves the right to incorporate discussions/interviews/presentations (the “Interview”) into the Proposal evaluation process at the short-list stage. The City, at its sole discretion, may interview short-listed Proponents and may ask them to make a short formal presentation to the City. (Presenters will be required to supply their own presentation equipment and materials.)

The Interview will serve as the mechanism for further evaluation of Proposals of short-listed Proponents at an in-depth and more detailed level in order to establish the finalist for Preferred Proponent status. The further detailed evaluation will take into account, discussions, presentations and clarifications with/by short-listed Proponents and analyses by the City, together with such other considerations as the City, at its sole discretion, deems necessary to complete its assessment of the short-listed proposed solutions. Bonus points to a maximum of **25 points** will be awarded in addition to the score obtained through the Evaluation Criteria.

Short-listed Proponents must be prepared to answer questions on their Proposals and shall cooperate with the City with respect to Interview scheduling and any other requirements imposed by the City.

The City reserves the right to limit interviews to a number of the top scoring Proponents as determined by the City regardless of the number of Proponents who qualified for the short list and the scoring point spread thereof.

The City reserves the right to augment the short list at any time.

13. NEGOTIATIONS

On completion of the evaluation process, vendor negotiations will be undertaken to refine the details of the contract for all portions of the proposed services described in this Request for Proposals. Negotiations may take the form of adding, deleting or modifying requirements.

Assuming mutually acceptable terms and conditions can be negotiated a contract will be signed with the selected proponent. In the event of default or failure to arrive at mutually acceptable terms and conditions, the City may accept another Proposal or seek new Proposals, or carry out this service in any other way deemed appropriate.

14. BEST AND FINAL OFFERS

Proponents are reminded that since this is a Request for Proposal a best and final offer may be requested, but this would be considered only with the short-listed proponents, if used at all. Proponents are encouraged to provide their best offer initially and shall not rely on oral presentations or best and final offers.

15. DISBURSEMENT OF FEES

The successful Consultant will be required to submit a payment schedule prior to commencing the project. The payment schedule shall be subject to the approval of the Project Coordinator.

Invoices will be required to contain the following minimum information:

- Description and explanation of work undertaken in each invoice time period;
- Personnel employed and hours expended by the hourly rate;
- Disbursements;
- Total Fee for each invoice;
- Budget expended to-date and remaining budget.
- 10% hold back applicable to all invoices.

The 10% hold back shall be reimbursed on the final approval of the project deliverables by Vaughan Council.

16. BUDGET

The budget for this study has an upset limit of \$173,135.00, which shall include all applicable taxes.

The Consultant shall not exceed the budget or undertake any work that would cause the budget to be exceeded without written permission from the City of Vaughan. Such permission shall be required for any phase or component of the study, as set out in the approved work plan.

17. CONTEXTUAL AND BACKGROUND INFORMATION

The following documents are available on the City of Vaughan web site and listed below for the information of the proponents in the preparation of the proposal. The documents are considered to be background to assist in developing an understanding of the origin of the project and the context within which the City of Vaughan is currently working. Items not originating with the City of Vaughan do not necessarily have the approval or endorsement of the City of Vaughan. It is the responsibility of the proponent to verify all facts contained in the attached documents. The information cited below is not considered to be comprehensive in respect of the issues the City will be facing and the background to the project.

- Natural Heritage in the City – Background Report. AECOM. April 2010. (<http://www.vaughantomorrow.ca/OPR/background.html>) ;
- Natural Heritage Review Background Study – Natural Heritage in the City. File 25.5.4. Committee of the Whole. June 1, 2010. Item 32. (http://www.city.vaughan.on.ca/vaughan/council/minutes_agendas/committee_2010/a20100601.cfm);
- City of Vaughan Official Plan. September 2010. (<http://vaughantomorrow.ca/OPR/index.html>);
- Green Directions Vaughan – Community Sustainability and Environmental Master Plan. (<http://vaughantomorrow.ca/EMP/index.html>);
- York Region Official Plan. Minister's Modified Copy. As approved by the Ministry of Municipal Affairs and Housing. 2010. (<http://www.york.ca/Departments/Planning+and+Development/Growth+Management/2010+Reports+and+Background+Papers.htm>).

18. REFERENCES

AMEC Earth and Environmental. 2010. Sixteen Mile Creek Areas 2 and 7 Subwatershed Study Update, Town of Milton (Final Draft). In consultation with Blackport and Associated, C. Portt and Associated, Dougan and Associates, Parish Geomorphics.

AMEC Earth and Environmental. 2010. Phases 1 to 3 Subwatershed Management Strategy and Implementation Plan, City of Brampton.

Credit Valley Conservation and Toronto and Region Conservation Authority. 2009. Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines. 22 pp.

Galli, John. 1996. *Final Technical Memorandum: Rapid Stream Assessment Technique (RSAT) Field Methods*. Department of Environmental Programs, Metropolitan Washington Council of Governments. Washington, D.C.

Ministry of Environment. 1999. Ontario Ministry of Environment. Revised Stormwater Management Guidelines Draft Report.

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

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Toronto and Region Conservation Authority. 2008. Humber River Watershed Plan: Pathways to a Healthy Humber.

Toronto and Region Conservation Authority. 2009. Don River Watershed Plan.

Toronto and Region Conservation Authority. 1994. Valley and Stream Corridor Management Program.

APPENDIX A – Relevant Recommended Actions of the Don River Watershed Plan and Humber River Watershed Plan***Don River Watershed Plan***

Select actions and targets of the Don River Watershed Plan (TRCA 2009) are provided below related to the objectives of the Vaughan NHN Study.

Water - Strategy 1 - Stormwater

Improve water balance and manage stormwater flows (i.e. infiltration, evapotranspiration, re-use) in priority sub-basins:

- tributaries of the Upper West Don River north of Major Mackenzie Drive (sub-basin 25) to protect aquatic habitat supporting aquatic species that are habitat specialists and regionally significant groundwater recharge;
- industrial lands west of Dufferin Street to mitigate flood risk (reduce peak flows) and improve habitat for long term indicator species (rainbow darter) (sub-basins 14, 28);
- Patterson Creek and the western tributaries of the Upper East Don River to protect existing and recovery reddsides dace habitat and regionally significant groundwater recharge (sub-basins 3A, 26, 4, 24).

Water - Strategy 3 - Groundwater

Identify and protect recharge and discharge as well as subsurface flow directions through municipal plans, policies and regulations;

Implement technologies and practices to infiltrate clean stormwater in new and redevelopment in high recharge areas (e.g., permeable paving, bioswales);

Maintain complex groundwater flow directions, particularly where groundwater is believed to be flowing across watershed boundaries;

In developments where the water table is shallow, convey cool, clean groundwater collected by foundation drains directly to watercourses or wetlands rather than stormwater management ponds, to avoid contamination and increases in temperature.

Water - Strategy 5 - Stream Form

DFO, conservation authorities and municipalities should continue to work in partnership to apply interim guidelines for assessing the function and appropriate treatment of headwater drainage features through the development planning process and refine them where necessary (*Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines*, Credit Valley Conservation and TRCA, 2009).

Investigate opportunities to acquire lands in strategic locations to allow stream corridors to evolve naturally, without impacting property or infrastructure.

Road crossings over watercourses should be sized appropriately and sited at appropriate locations to minimize potential for alterations to channel form and allow for natural movement of the channel within the flood plain (for example, not on a meander).

Nature – Aquatic System

Population maintenance and recovery of indicator species and other targets have been identified for each of the Fish Management Zones (FMZs) in the Don River Watershed. FMZs 1, 2 and 3 include headwater areas and upper stream reaches in Vaughan.

Implement Redside Dace Recovery Team recommendations to investigate the existing redside dace population status and habitat improvement and protection opportunities (in FMZ 1 where this species is currently known to occur and in FMZs 2 and 3 where a population may be recovered).

Protect and improve in-stream habitat for the Indicator Species as per recommendations in Chapter 6 of the watershed plan and the Fisheries Management Plan.

Create or enhance riparian wetlands, with focus on reaches that still support aquatic communities that rely on this habitat (e.g., known populations of brassy minnow), as per recommendations in Chapter 6 of the watershed plan and the Fisheries Management Plan.

Nature – Terrestrial System – Strategy 1 -Ecological Function

Restore and maximize habitat connectivity, especially east-west corridors across tableland.

Increase representation of upland communities and wetlands on tableland.

Create ecopassages for amphibians and other wildlife crossings of streets in greenfield development areas.

Nature – Terrestrial System – Strategy 2 - Securing a System

Strategy 2 action items address site securement plans to protect the TRCA Terrestrial Natural Heritage System. This is the focus of the NHN Study, to provide justification for areas to add to remove from the NHN based on clear and transparent criteria.

Nature – Terrestrial System – Strategy 3 - Quality of the Natural System

Target regeneration of natural cover in priority sites (Figure 27 of the watershed plan). The highest priority areas in Vaughan, ranked as Priority 1 and 2 sites, include Block 27, the Maple Uplands (McGill area), and Block 28. Priority 3 ranked sites in Vaughan include Maple Uplands (Teston Road), Baker's Woods and Canada's Wonderland.

Community – Cultural Heritage – Strategy 1 - Conserve Cultural Heritage

Retain Aboriginal archaeological sites as greenspaces, to the extent possible, with limited investigative excavations, preserved and protected as designated properties or cultural heritage landscapes under the *Ontario Heritage Act*.

Maintain the countryside character of sections of the remaining rural roads, such as Kirby Road, as part of the cultural heritage landscape. Associated historic farmsteads could be maintained or adapted for future uses.

Community – Nature-based Experiences – Strategy 2 - Expand Trails Network

Municipalities and TRCA should continue to expand the inter-regional trail network by creating the required north-south and east-west linkages (Figure 28 of the Don River Watershed Plan):

- In Vaughan, along a completed Bartley Smith Greenway from Teston Road to south of Steeles Avenue;
- In the headwaters, along the Trans-Canada Pipeline south of Kirby

Humber River Watershed Plan

Select recommended strategies in the Humber River Watershed Plan related to the NHN Study are provided below. The numbering of the select recommendations is taken from the watershed plan (see Chapter 5 of the Humber River Watershed Plan).

Water - Strategy 1 – Protect Recharge and Discharge

1. Identify and protect recharge (Figure 3–5) and discharge as well as subsurface flow directions through municipal plans, policies and regulations;
 - Protect and maintain the function of high volume recharge areas and local recharge areas for those reaches that are heavily reliant on local sources of groundwater discharge (e.g., Centreville Creek, Cold Creek and upper East Humber).
 - Review opportunities early in the development planning process to set aside important recharge areas for inclusion in the open space or natural heritage system. Undertake this broad scale urban growth planning and optimization of site designs through subwatershed scale studies.

Water - Strategy 2 – Increase Natural Cover

4. Implement natural cover improvements as quickly as possible in the headwaters of the West Humber, Purpleville Creek, upper East Humber and Rainbow Creek subwatersheds in advance of future urbanization, to help mitigate predicted impacts on stream flow and erosion:
 - Priority should be given to the headwaters of the tributaries that flow through approved urban growth areas.
 - In some areas, restoration of wetlands is more appropriate and effective for water management purposes than reforestation (e.g., on the clay soils of the West Humber).

Water - Strategy 5 – Implement Stormwater Retrofits

23. Retrofit existing urban areas with improved lot level, conveyance and end-of-pipe stormwater controls
- Emphasize exfiltration, evapotranspiration and rainwater harvesting technologies in areas of low soil permeability (e.g., West Humber, Rainbow Creek, and Purpleville Creek subwatersheds).
 - Emphasize infiltration over evapotranspiration where local recharge to groundwater provides a significant portion of baseflow and is critical to maintain aquatic habitats (e.g., Centreville Creek, Cold Creek, and upper East Humber subwatersheds).

Water - Strategy 9 – Protect Stream Form

34. Investigate opportunities to acquire lands in strategic locations to allow stream corridors to evolve naturally, without affecting property or infrastructure.

Aquatic System - Strategy 1 – Natural Stream Flows

45. In the headwaters and upper reaches of the Main and East Humber River (FMZ 1, 2 and 3), maintain or enhance existing ecosystem functions, particularly with respect to water balance with a focus on reforestation, and avoiding relocation of stream channels.
46. In the middle reaches (FMZ 4, 5, 6, 7 and 8), focus on protection and impact mitigation measures that maintain pre-development stream flow conditions as closely as possible and avoid relocation of stream channels. This should include increased tree cover (tableland and riparian), restoration of wetlands on marginal agricultural land, and improved development practices to increase evapotranspiration and avoid increases in surface water runoff. Priorities include
- Focus on maintaining and enhancing brook trout and reddsides habitat in Purpleville Creek (FMZ 4).
 - In the Lower West Humber (FMZ 7), maintain and enhance habitat for reddsides dace and potentially brassy minnow, sand shiner, pearl dace and freshwater mussels, through restoration of riparian wetlands and meadows along the small tributaries.

Aquatic System - Strategy 3 – Support Redside Dace Recovery

52. Implement management actions to protect existing populations and habitats of reddsides dace
- In areas identified in the *Humber River Fisheries Management Plan* as habitat for reddsides dace, adherence to the recommendations listed for minimum riparian buffer width in the *Redsides Dace Recovery Strategy* (MNR, 2005) should be upheld. The highest level of protection between the two plans should be applied.
 - Apply findings from an intensive monitoring study being conducted in the Rouge River (2007) regarding urbanization impacts on streams supporting reddsides dace.

Terrestrial System – Strategy 1 – Secure a Targeted System

60. Consistent with Recommendation 60 of the Humber River Watershed Plan, use biodiversity and ecosystem targets to test the TRCA Terrestrial Natural Heritage System for inclusion in the NHN.

Terrestrial System – Strategy 2 – Enhance Natural Cover

63. Restore areas within the target terrestrial natural heritage system focusing on

- Areas where natural cover will achieve multiple watershed benefits
- The most vulnerable habitat patches (e.g., those with species of concern in urban and near urban locations)
- Existing urban and urbanizing areas
- Assignment of restoration priorities should consider the importance of maintaining productive agricultural land in the watershed

Economy – Strategy 3 – Sustainable Infrastructure

122. In developments where the water table is shallow, convey cool, clean groundwater collected by foundation drains directly to watercourses or wetlands rather than stormwater ponds, where possible, to avoid contamination and increases in temperature.

Resource Use – Strategy 1 – Water Efficiency

142. Use baseline baseflows defined by TRCA to determine the threshold below which no surface water may be drawn from a watercourse unless detailed studies are undertaken to support other withdrawal volumes:
- Water users should install fixed intakes to prevent withdrawals below the baseflow threshold.
 - Irrigation water supply systems should be retrofitted to replace stream sources with rainwater from surface water storage reservoirs, where possible.

Ontario Regulation 293/11 – Redside Dace Regulations Under the ESA

Habitat Regulations under the ESA (2007) are summarized below.

The regulated habitat for Redside Dace protects elements of direct habitat including stream reaches where the species has been recorded within the past 20 years and in which the habitat is still suitable. Protected recovery habitat includes formerly occupied stream reaches in occupied or adjacent subwatersheds where there is a reasonable likelihood of successful stream corridor rehabilitation and natural recolonization. Protected indirect habitat includes the associated meander belt width plus vegetated areas or agricultural lands, within 30 metres of the meander belt for each occupied or recovery stream reach; protected indirect habitat also includes streams, headwaters drainage features, groundwater discharge areas or wetlands that augment or maintain baseflows, coarse sediment supply and surface water quality to occupied or recovery reaches where the average bankfull width of the respective occupied or recovery reach is less than or equal to 7.5 metres wide.

(Source:

<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/268554.html>).

Regulations under the Endangered Species Act for redside dace habitat are excerpted below.

Redside dace habitat

29.1 For the purpose of clause (a) of the definition of “habitat” in subsection 2 (1) of the Act, the following areas are prescribed as the habitat of redside dace:

1. Within the cities of Hamilton and Toronto, the counties of Bruce, Grey, Huron, Simcoe and Wellington, the regional municipalities of Durham, Halton, Peel and York, the Townships of St. Joseph, Jocelyn and Hilton, and the Village of Hilton Beach,
 - i. any part of a stream or other watercourse that is being used by a redside dace,
 - ii. any part of a stream or other watercourse that was used by a redside dace at any time during the previous 20 years and that provides suitable conditions for a redside dace to carry out its life processes,
 - iii. the area encompassing the meander belt width of an area described in subparagraph i or ii,
 - iv. the vegetated area or agricultural lands that are within 30 metres of an area described in subparagraph iii, and
 - v. a stream, permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality of a part of a stream or other watercourse described in subparagraph i or ii, provided the part of the stream or watercourse has an average bankfull width of 7.5 metres or less.
2. Within the City of Hamilton, counties of Bruce, Grey, Huron, Simcoe and Wellington and the regional municipalities of Durham, Halton, Peel and York,
 - i. any part of a stream or other watercourse used by a redside dace at any time in the past that is located in the same or adjacent sub-watershed as the area

- identified in subparagraph 1 i or ii that provides suitable conditions for successful stream corridor rehabilitation and for natural recolonization of reddsides,
- ii. the area encompassing the meander belt width of an area described in subparagraph i,
 - iii. the vegetated area or agricultural lands that are within 30 metres of an area described in subparagraph ii, and
 - iv. a stream, permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality of a part of a stream or other watercourse described in subparagraph i, provided the part of the stream or watercourse has an average bankfull width of 7.5 metres or less.