

COMMITTEE OF THE WHOLE JUNE 1, 2010

NATURAL HERITAGE REVIEW BACKGROUND STUDY - NATURAL HERITAGE IN THE CITY FILE NO. 25.5.4

Recommendation

The Commissioner of Planning recommends:

1. That the information and recommendations contained in the report, "Natural Heritage in the City", April 2010, prepared by AECOM and Urban Strategies Inc., BE RECEIVED; and that the new Official Plan contain appropriate policies having regard for the findings of the study.

Contribution to Sustainability

The Province and the Region of York have embarked on an ambitious vision and policy framework for managing growth and to achieve more efficient land use. The findings of the natural heritage review will be reflected in the City's draft new Official Plan that will direct growth to 2031 while balancing the needs of a growing population base, developing a healthy economy and protecting vital natural environment for future generations.

Green Directions Vaughan (2009) provides the following objective with respect to Natural Heritage in the City:

2.2.4. Develop a comprehensive Natural Heritage Strategy that examines the City's natural capital and diversity and how best to enhance and connect it. As part of this action:

- *Develop an inventory of Vaughan's natural heritage, and identify opportunities for habitat restoration;*
- *Ensure that policies in the City's new Official Plan protect all ecological features and functions as per current provincial and regional policies, and also include consideration for locally significant natural features and functions;*
- *Develop policies to create opportunities for near urban agriculture within Vaughan's rural areas, through policies described in the City's new Official Plan.*

The identification of a Natural Heritage Network is a key component in support of the strategy.

Economic Impact

A comprehensive assessment of economic impacts was not a part of the terms of reference of the background study. Some urban development in proximity to the Natural Heritage Network may be affected in order to maintain the integrity of natural areas and conform to the natural heritage policies. The positive economic contributions of ecosystem functions in cleaning air, filtering water, conserving energy and regulating stormwater flows, among other human health benefits, are evident.

Communications Plan

The results of the analysis have been communicated to the public through two major open houses for the Official Plan process held on May 28, 2009 and November 18, 2009, as well as a statutory Public Meeting on May 3, 2010.

The consultation process to-date included regular meetings with City departments, the Toronto and Region Conservation Authority, the Region of York, members of the Official Plan Consulting

lead team, Urban Strategies Inc., and a status and update presentation of the draft report to the Official Plan Review Committee on September 15, 2009 and April 1, 2010.

Purpose

The purpose of this report is to inform Council of the work completed to date on the development of a Natural Heritage Network in the City of Vaughan. The background study, "Natural Heritage in the City", will accompany and support the City's draft new Official Plan and the future vision for growth balanced with environmental protection.

Background - Analysis and Options

In 2007 the City began the process of preparing a new Official Plan as part of the City's Consolidated Growth Management Strategy. A major element of the City's future vision is to accommodate much of its future residential growth through intensification opportunities which will be reflected in the City's new Official Plan. This will bring the City into conformity with new Provincial and Regional policies that seek to achieve higher densities in a more compact urban form.

As part of the ongoing Official Plan review, 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 Policy and Planning Context

i) Provincial Policies

The Province of Ontario released a 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. As the City prepares the new Official Plan, the land use policies 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 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 comprises 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 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 (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.

ii) York Region Official Plan (YROP)

The York Regional Official Plan is the upper tier planning document that provides the framework for achieving the Region's urban structure. Any amendments to the City's Official Plan must conform to the Region's Official Plan. The Regional Official Plan must also adhere to the Provincial policies articulated in the Growth Plan. A new Regional Official Plan was adopted by Regional Council in December 2009 as part of a conformity exercise to update its planning policies. The City's new Official Plan is required to reflect the vision of both plans.

The YROP 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 OP. The policies that form the basis for this system are:

"... designed to identify, protect, and enhance a linked Regional Greenlands System as a permanent legacy for York Region."

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 York Region OP (2009).

iii) Toronto and Region Conservation Authority Policy and Regulation

The Toronto and Region Conservation Authority (TRCA) have a regulatory role that focuses on watercourse management to protect public and private property from flood damage which is achieved through a commenting role on development applications submitted to the municipality under the Planning Act. They rely on three key instruments to guide their comments and permitting: the Terrestrial Natural Heritage System; watershed plans; 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 draft Don River Watershed Plan describe TNHS for the respective watersheds and include implementation recommendations regarding land use, outreach and stewardship. The target for natural cover in the Vaughan portion of the two watersheds combined is 22% (TRCA, Sept. 2009).

Watershed Plans are mandated under the Oak Ridges Moraine Conservation Plan and Greenbelt 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.

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 destruction of sensitive environmental areas such as wetlands, shorelines and watercourses. In evaluating projects, TRCA relies on the policies contained within the Valley and Stream Corridor Management Program (1994) currently under review.

Analytical Approach

The terms of reference for the natural heritage review is articulated in Section 3.6.5 of the overall Terms of Reference for the Official Plan Review process. It describes a research approach dependent largely on the synthesis of existing information, with particular attention to the TRCA Terrestrial Natural Heritage System and studies undertaken by the Region of York in support of the Regional Greenlands System.

Consultation with the TRCA and Region of York determined that the NHN should consist of core features that receive the highest form of protection together with supporting areas. Identifying core features conforms to the Key Natural Heritage Features and Key Hydrologic Features articulated in the Region of York Official Plan (2009). Supporting lands are described below as Enhancement Areas, Built-up Valleylands and supporting areas.

Main Findings

Several key results of documenting the ecological and biological diversity characteristics of Vaughan are worth noting.

- i) Areas of hydrogeological sensitivity, including areas of higher infiltration and recharge rates of groundwater, are concentrated in the Oak Ridges Moraine and Kleinburg community areas.
- ii) There are two fish species listed as species at risk. Redside dace (*Clinostomus elongates*) is classified as endangered nationally and threatened provincially, and is now listed under the Ontario Endangered Species Act, 2007. A draft recovery plan has been prepared and efforts are underway to restore the habitat. This is an insectivorous fish characteristic of cold and cool-water streams. Northern brook lamprey (*Ichthyomyzon fossor*) is a Species of Concern, nationally and provincially. It is characteristic of clear streams, and spawning occurs in fast flowing areas with coarse gravel or rocky substrates. It is a non-parasitic filter feeder, and it feeds on organic detritus, algae and protozoans.
- iii) Of the 35 species of fish in the Don River watershed, 33 have been found in Vaughan as sampled at 95 sites. Four of the species are non-native. Of the 48 fish species in the Humber River watershed, 46 have been found in Vaughan as sampled at 56 sites. Three of the species are non-native. Based on species richness data and other criteria, six Sensitive Fish Areas are identified in Vaughan.
- iv) Of the 29 rare plant species observed in Vaughan through past studies, only the Butternut tree (*Juglans cinera*) is nationally and provincially ranked while the remaining are mostly locally rare and regionally rare. Most rare plant species have been observed in Areas of Natural and Scientific Interest and Environmentally Significant Areas (ESAs).
- v) A total of 147 breeding bird species have been reported in Vaughan. Forty area-sensitive bird species have been detected. Area-sensitive bird species either prefer to breed in larger patches of suitable habitat or are found at higher breeding densities in larger habitat patches. Warbler species accounted for 31% (10 species) of the forest area sensitive species, raptors and owls represented an additional 22% (7 species), and woodpecker species comprised 9% (3 species) of the forest area sensitive bird species observed. The highest concentrations of area sensitive bird species are in the ESAs. Apart from the ESA protected lands, the natural communities bordering the Humber River and north of Nashville Road are the only other areas that provide large enough habitat patches for area-sensitive species such as the Black-throated Blue Warbler (*Dendroica caerulescens*) and Scarlet Tanager (*Piranga olivacea*).
- vi) Twelve amphibian and five reptile species have been reported in the city. Of the 17 species reported in the area, one is a Species at Risk and one is a provincially rare species. The Milk Snake (*Lampropeltis triangulum*) is designated as a species of Special Concern by the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Ontario Ministry of Natural Resources (OMNR). It was detected in one location in 1999 by TRCA. A Jefferson x Blue Spotted Salamander hybrid (*Ambystoma* hybrid) was detected by TRCA in 2005, and reported to NHIC in

the 1970s. This hybrid is provincially imperilled according to the OMNRs Natural Heritage Information Centre (NHIC).

- vii) Of the 22 mammal species reported in Vaughan, those that are not urban-tolerant species worthy of note include Mink (*Mustela frenata*), River Otter (*Lontra canadensis*) and Southern Flying Squirrel (*Glaucomys volans*).
- viii) Existing natural cover in the City of Vaughan comprises approximately 5,775 ha, or 21% of the total area of the city (TRCA 2004). This is just slightly above the average of 17% natural cover in the Toronto and Region Conservation Authority (TRCA) jurisdiction. Natural cover comprises woodlands (16% cover), wetlands (2% cover) and meadow (3% cover).
- ix) Forest cover represents 80% of all natural cover in Vaughan. Of this, 52% of forest cover is below the top of bank and associated with valleyland systems. Hence, tableland forests are under-represented in the remaining natural cover as a result of past forest clearing for agriculture followed by urban expansion.
- x) Woodlands cover 16% of Vaughan, which is below the 25% forest cover target set by York Region.
- xi) Approximately 2% wetland cover remains in the City of Vaughan comprising 65 individual wetlands, most of which are classified as marsh communities. Wetlands likely only covered 5% of Vaughan in pre-settlement times (e.g. 1800).
- xii) Meadow communities cover 3% of Vaughan and, while created by natural and human disturbance, provide important habitat to support species diversity.
- xiii) Two sand barren communities are identified in the Oak Ridges Moraine. Generally, sand barrens are classified as Provincially rare community types according to the Natural Heritage Information Centre.
- xiv) An overlay analysis of landforms, flora and fauna illustrate three main areas of ecological and biological diversity in Vaughan. These are the most critical areas to consider expanding and/or improving the ecological integrity of the Natural Heritage Network.
 - One of the biodiversity concentration areas is located along the upper reaches of the Main Humber River, north of Nashville Road. The area in the northwest corner of the City near the terminus of Kirby Road and Huntington Road is largely undeveloped and is predominantly natural cover. The wildlife in this area benefit from the absence of roads crossing this large contiguous block of habitat. If Kirby Road or Huntington Road were to be extended in the future, many of the ecosystem functions would be lost in this natural centre of enhanced function.
 - The second biodiversity concentration area also occurs in the Humber River watershed. This centre is associated with the East Humber River valley and extends north from Langstaff Road. The area north of the terminus of Pine Valley Drive is a focus for bird and amphibian breeding. If Pine Valley Drive were to be extended there would be disruption to this habitat block.
 - The third centre is found in the Don River watershed, in the headwaters of the East Don in the area north of Major Mackenzie. These coldwater tributaries are important for the Don River as a whole, by providing year round flow, even in dry periods. The area of biodiversity concentration is located mostly although not

exclusively in the Oak Ridges Moraine. The features on the Oak Ridges Moraine are unique in the City and require special consideration.

Components of the Natural Heritage Network (NHN)

A delineated Natural Heritage Network (NHN) for the City of Vaughan is a result of the examination of the distribution of biodiversity together with an evaluation of land use. In total the NHN comprises almost 9,600 ha, representing 34.8% of the land base in the City of Vaughan, and made up of four parts:

- Core Features make up the largest component of the NHN at 6,487 hectares and cover 23.6% of Vaughan;
- Enhancement Areas cover 513 hectares (1.9%) of the City;
- Built-up Valleylands (existing residential, commercial and industrial development that occurs below the physical top of slope) cover 169 hectares (0.6%) of the City; and
- Other supporting lands, such as agricultural lands, within the Greenbelt comprise 2,412 hectares or 8.8% of the City.

Core Features have the greatest level of protection in policy, such as natural heritage features as defined in Section 2 of the Provincial Policy Statement (PPS). Development and/or site alteration is not permitted in Core Features, and significant alteration or expansion of existing development in such areas will not be permitted. Core Features include: valley and stream corridors; wetlands as identified by the City in consultation with TRCA; woodlands; significant wildlife habitat and significant habitat of threatened or endangered species, and species of concern, including concentrations of biodiversity; fish habitat (including all watercourses); Environmentally Significant Areas and Areas of Natural and Scientific Interest (regional and provincial; life science and earth science); Key Natural Heritage Features and Key Hydrological Features on lands to which the Greenbelt Plan policies and/or regulations apply; and, hazard lands (floodplains, meander belts and stable top of bank).

Enhancement Areas include those supporting lands that are important to the network, and important to incorporate into land use planning such as:

- Stormwater management ponds that are contiguous with a valley corridor or other identified natural heritage feature;
- Exceptional floodlines where in a few locations historical development has occurred that has created a floodplain that, with redevelopment, will result in a refinement of the floodplain (identified by TRCA as part of O.R. 166/06)
- Grasslands, including (and supportive of) agricultural uses connected to the Network;
- Landscape linkages, where there may be more than one alternative to create the linkage; and,
- Habitat enhancement areas identified through modelling and consultation.

If development is proposed in or adjacent to Enhancement Areas, an assessment of the ecosystem functions in the context of the NHN provided by those lands must be undertaken. The goal of the assessment of ecosystem functions is to ensure, at a minimum, no net loss of functions and demonstrate consistency with the sustainable development objectives identified in Green Directions Vaughan, the City of Vaughan Community Sustainability and Environmental Master Plan. The detailed studies of Enhancement Areas may result in minor modifications to their precise boundaries provided that the intended ecosystem functions are maintained.

The Built-up Valleylands are those residential, commercial and industrial lands that currently occur below the physical top of slope in areas such as Woodbridge and Kleinburg. As part of a connected network, the valleys clearly provide distinct corridors on the landscape, and as such, even developed areas within the valley contribute to the connected network. Urban streetscaping

and backyard biodiversity (wildlife habitat and/or use of native species in landscaping) contribute to the maintenance of connectivity and any redevelopment proposal should recognize those ecosystem functions, not only in the valley but across the City.

Other Supporting Lands identify those lands within the Greenbelt natural heritage system within the City that are currently subject to agricultural and/or rural uses and associated rural buildings. These supporting lands contribute important features to the NHN that are associated with open space: species that require open areas to complete their life cycles such as Eastern Meadowlark, Bobolink and Horned Lark; and rare vegetation communities. As a result, these lands are expected to remain providing agricultural services, but, in the event that this use is abandoned, those lands should remain natural, with no potential to convert to more urban uses. The intent is to permit agricultural activities, but to restrict expansion of agricultural activities into adjacent woodlots, wetlands, ravines and watercourses, or other features as identified as Core Features.

The Natural Heritage Network in Vaughan represents an interconnected system of natural features and their respective functions. It is the core features that are the anchors for this network; and it is the interaction of these core features within the network that will keep the integrated system as a whole, healthy and resilient. By establishing these core features in concert with enhancing and linking designated areas, this defines the minimum amount of area that the City of Vaughan needs to protect and manage into the future.

Next Steps

A delineated Natural Heritage Network marks a significant milestone for the City of Vaughan. For the most part, the Core Features of the NHN include remaining natural areas with some attention to restoration areas in the category known as Enhancement Areas. Habitat and wildlife targets for the NHN have not been determined through this study. In the report, *How Much is Enough* (Environment Canada 2004), a target of 30% natural cover in a watershed is recommended to maintain ecosystem health. York Region has set a 25% forest cover target for the Region. Hence, one area of further analysis is to identify more specific habitat and wildlife targets appropriate for a growing and largely urban municipality.

The natural heritage review relied on existing information rather than conducting new field studies and habitat assessments. Two critical methodological gaps were not articulated in the terms of reference for the background study. First, there has not been an examination of the habitat condition of the component parts of the NHN, particularly the Core Features. The quality of a natural area is important in determining the ability of the area to support biodiversity. Related to this, there has not been an analysis of the population viability of select species, that is, the probability that select indicator species will persist for the long term. This is critical to understanding whether the NHN is providing the intended ecosystem functions such as biodiversity maintenance and environmental stream flows.

As a result, completing the NHN requires two additional areas of research to define targets for the NHN:

- A significant wildlife habitat study will identify indicator species or functional groups of species that characterize healthy ecosystems within a largely urban setting;
- A headwaters streams study will verify effectiveness of the NHN and/or recommend further protection along select stream reaches. Headwater streams are particularly important in maintaining water quality and natural environmental flows in a watershed, as well as providing critical wildlife habitat.

The City should consider these research areas as part of a later study to augment existing work and further refine the Natural Heritage Network.

Ongoing refinements to the NHN may also result from new information, including:

- Evaluation by the Ministry of Natural Resources of a new Provincially Significant Wetland Complex centred on the East Humber that will be released in the near future;
- Studies being undertaken to address flooding issues in the Black Creek watershed, a tributary to the Humber River; and
- Environmental Assessments for the extension of the subway into Vaughan, which proposes to realign the drainage to facilitate a new station, and the fly-over planned for north of Hwy 400 and Hwy 7 (Blocks 29 and 30) will have consequences to the final NHN on these lands.

Revisions to the current Environmental Management Guide (EMG) are required to incorporate the findings of the Natural Heritage in the City background study and support the environmental policies in Chapter 3 of Volume 1 of the City of Vaughan Official Plan. This is particularly important to ensure that the ecological integrity of the NHN is improved over time. A draft of the revised EMG has been written and is being circulated to appropriate City staff and external agencies for review. It is intended that the EMG may be included as an appendix to the City of Vaughan Official Plan as a supplementary guiding document.

Relationship to Vaughan Vision 2020/Strategic Plan

The Natural Heritage in the City report is consistent with the Vaughan Vision 2020 Strategic plan, through the following initiatives, specifically:

Service Excellence:

- Lead & Promote Environmental Sustainability

Management Excellence:

- Plan and Manage Growth & Economic Vitality
- Demonstrate Leadership & Promote Effective Governance

This report is consistent with the priorities previously set by Council.

Regional Implications

Amendments to the Regional Official Plan as it pertains to delineation of the Regional Greenlands System are not required to recognize the City of Vaughan Natural Heritage Network. Policies in the Region of York OP support the effort of local municipalities to identify local greenlands systems.

Conclusion

The report, Natural Heritage in the City, provides the analysis and support to delineate the City of Vaughan's first Natural Heritage Network. Environmental policies in Chapter 2 of the City of Vaughan Official Plan address the support and enhancement of the Natural Heritage Network. Additional studies are identified and recommended to complete the Natural Heritage Network by recognizing biodiversity targets within an urban municipality.

Attachments

1. City of Vaughan Natural Heritage Network Map.

2. City of Vaughan, Natural Heritage in the City report, April 2010 (Mayor and Members of Council ONLY)

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Respectfully submitted,

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Attachment 1 City of Vaughan Natural Heritage Network map.