

Greenbelt Plan 2005

**Technical Definitions and Criteria for Key Natural  
Heritage Features in the Natural Heritage System  
of the Protected Countryside Area**



Technical Paper 1

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## 1.0 Introduction

The Greenbelt Plan (Plan) was approved on February 28, 2005. It includes lands within, and builds upon the ecological protections provided by, the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP). The Plan identifies where urbanization should not occur in order to provide permanent protection to the agricultural land base and the ecological features and functions occurring on this landscape. The decisions of municipalities, provincial ministers, ministries and agencies made under the *Planning Act* or the *Condominium Act, 1998* or in relation to a prescribed matter, are required to conform to this Plan.

The Plan contains three types of geographic specific policies that apply to specific lands within the Protected Countryside (as shown on Schedule 1 of the Greenbelt Plan). One of the geographic specific policy areas is the Natural System. This system provides a continuous and permanent land base necessary to support human and ecological health in the Greenbelt and beyond. The other two geographic specific policy areas are the Agricultural System and Settlement Areas.

The Natural System comprises the Natural Heritage System (NHS), Water Resource System and key natural heritage features (KNHFs) and key hydrologic features (KHF).

As part of its technical support role to the Ministry of Municipal Affairs and Housing (MMAH), the Ministry of Natural Resources (MNR) has developed this technical paper to assist planning authorities and others with the implementation of the policies for KNHFs that are located within the NHS in the Protected Countryside area. This technical paper also addresses some of the technical requirements contained in other sections of the Greenbelt Plan.

In the future, MNR will be developing additional supporting documents for the Greenbelt Plan, including criteria for significant wildlife habitat and procedures for natural heritage evaluations.

This technical paper does not apply to any lands which are subject to the NEP and/or the ORMCP.

## 2.0 Purpose

The purpose of this technical paper is to provide technical assistance to planning authorities and others in the identification and delineation of KNHFs in the NHS of the Protected Countryside. Beyond the NHS within the Protected Countryside, Section 3.2.4.3 of the Greenbelt Plan indicates that KNHFs are to be defined pursuant to, and subject to the policies of, the Provincial Policy Statement (PPS), 2005.

However, it should be noted that Section 3.2.4 of the Greenbelt Plan states that wetlands are also KHFs. The criteria contained in this technical paper can also be used for the purpose of identifying and delineating wetlands that are KHFs, including those wetlands that are located beyond the NHS.

As stated in Section 3.2.4 of the Greenbelt Plan, the following natural heritage features and areas constitute KNHFs:

- Significant habitat of endangered species, threatened species and special concern species;
- Fish habitat;
- Wetlands;
- Life science Areas of Natural and Scientific Interest (ANSIs);
- Significant valleylands;
- Significant woodlands;
- Significant wildlife habitat;
- Sand barrens, savannahs, tallgrass prairies; and
- Alvars.

This technical paper was prepared based on the best science and information available at the time of preparation and will be amended from time to time to incorporate new information and improved approaches as they become available.

### 3.0 Policy Context

The Greenbelt Plan builds upon the existing policy framework established in the PPS. As an example, the PPS policies apply to provincially significant life science and earth science Areas of Natural and Scientific Interest (ANSIs) that are located throughout the entire Protected Countryside. Both provincially and regionally significant life science ANSIs located within the NHS of the Protected Countryside have received an enhanced level of protection by the Greenbelt Plan.

An individual natural heritage feature may be identified as constituting more than one KNHF. For example, a specific area of land may constitute a wetland as well as a life science ANSI. Where KNHFs overlap, the most stringent policy requirements of the Greenbelt Plan will apply.

The following are some policies from Section 3.2.4 of the Greenbelt Plan that apply to KNHFs:

#### Section 3.2.4.1

*Development or site alteration is not permitted in key hydrologic features and key natural heritage features within the Natural Heritage System, including any associated vegetation protection zone, with the exception of:*

- a) *Forest, fish and wildlife management;*
- b) *Conservation and flood or erosion control projects, but only if they have been demonstrated to be necessary in the public interest and after all alternatives have been considered; or*
- c) *Infrastructure, aggregate, recreational, shoreline and existing uses, as described by and subject to the general policies of section 4 of this Plan.*

#### Section 3.2.4.4

*In the case of wetlands, seepage areas and springs, fish habitat, permanent and intermittent streams, lakes, and significant woodlands, the minimum vegetation protection zone shall be a minimum of 30 metres wide measured from the outside boundary of the key natural heritage feature or key hydrologic feature.*

#### Section 3.2.4.5

*A proposal for new development or site alteration within 120 metres of a key natural heritage feature within the Natural Heritage System or a key hydrologic feature anywhere within the Protected Countryside requires a natural heritage evaluation and hydrological evaluation, which identify a vegetation protection zone which:*

- a) *is of sufficient width to protect the key natural heritage feature or key hydrologic feature and its functions from the impacts of the proposed change and associated activities that may occur before, during, and after, construction, and where possible, restore or enhance the feature and/or its function; and*

- b) *is established to achieve, and be maintained as natural self-sustaining vegetation.*

It is important to read the Greenbelt Plan in its entirety as there are other policies in the Plan that also apply to KNHFs.

#### **4.0 Mapping**

The Greenbelt Plan states that municipalities will have maps available showing known KNHFs and any associated minimum vegetation protection zones. In the case of significant woodlands, since some criteria for the determination of significance are simple to apply and other criteria require detailed information that may not yet be available, additional woodlands may be identified as significant at later stages of the municipal planning process.

##### *Boundary Refinement*

It is recognized that the delineation of some natural features in municipal plans and zoning by-laws may be based on the best available information at the time. Planning and development applications for sites within 120 metres of a KNHF within the NHS will trigger the need for a natural heritage evaluation. This could lead to a refinement in the boundaries of the KNHF (and possibly the identification of additional KNHFs). It is expected, therefore, that municipal official plans and zoning by-laws will be amended over time to provide greater precision in the mapping of KNHFs, in a manner consistent with the policies of the Greenbelt Plan.

##### *Features that Straddle the Boundary of the Natural Heritage System*

The policies of Section 3.2.4 of the Greenbelt Plan apply to KNHFs that are located within the NHS of the Protected Countryside. If a KNHF straddles the boundary of the NHS, the portion of the KNHF that is located within the NHS is subject to the natural features policies of the Plan while the portion that is located outside the NHS is not.

The PPS applies to KNHFs that are wholly or partially located outside of the Greenbelt NHS. Where a KNHF straddles the Greenbelt NHS and the Greenbelt Plan outer boundary, adjacent to areas where the Oak Ridges Moraine Conservation Plan (ORMCP) applies, the ORMCP technical papers will apply on the ORMCP side.

Due to the scale of mapping that was provided as part of the Greenbelt Plan, a municipality may decide in accordance with policy 3.2.2.6 to further refine the boundary of the NHS with greater precision, to incorporate those portions of KNHFs that straddle the NHS boundary.

There is also nothing to prevent a municipality from exercising its authority under the *Planning Act* to extend the natural features policies of the Greenbelt Plan beyond the boundaries of the NHS if it wishes to afford those areas a greater level of protection, provided this would not conflict with other provincial land use policies. It should be noted that section 5.3 of the Greenbelt Plan states that official plans and zoning by-laws shall not contain provisions that are more restrictive for *agricultural uses* and mineral aggregate resources than those contained in the Greenbelt Plan.

The portion of a natural heritage feature that is located outside the NHS may still need to be considered when determining whether the portion that is located within the NHS constitutes a KNHF. This will be necessary when applying the technical criteria that are contained in this paper for wetlands, significant valleylands and significant woodlands as all of these technical criteria include a threshold for size.

## 5.0 Data Sources

In order to assist municipalities in meeting the mapping requirements described in Section 4 of this paper, MNR has provided municipalities and conservation authorities with access to detailed natural heritage features data.

Natural heritage features data are available from Land Information Ontario (LIO) and Natural Heritage Information Centre (NHIC) websites. MNR continues to update and improve these data sets on an ongoing basis as new information is collected. Signatories to the Ontario Geospatial Data Exchange (OGDE) or the Municipal Planning Data Licence (MPDL) can obtain data via the established data access processes using the Land Information Data Subscription Service (LIDS) at:

[http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STEL02\\_167956.html](http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STEL02_167956.html). In

addition, data for generalized occurrences of species at risk are available from the Natural Heritage Information Centre (NHIC) website at:

<http://nhic.mnr.gov.on.ca/MNR/nhic/species/shapefile.cfm> (see Section 7.1.2 below for more detail).

The local MNR district offices may have additional data, and can provide advice on the best available sources or recent data improvements.

The above mentioned data sets relate to selected natural heritage features and do not necessarily identify KNHFs as defined in the Greenbelt Plan. Technical criteria may need to be applied to these data in order to identify and map KNHFs. The purpose of this paper is to provide this technical assistance to planning authorities and others in identifying and delineating KNHFs.

## 6.0 Vegetation Protection Zone

Actual vegetation protection zones for KNHFs are determined through natural heritage evaluations. The procedures for completing natural heritage evaluations, as required by the Greenbelt Plan, will be established in a separate technical paper.

The Greenbelt Plan defines “vegetation protection zone” as:

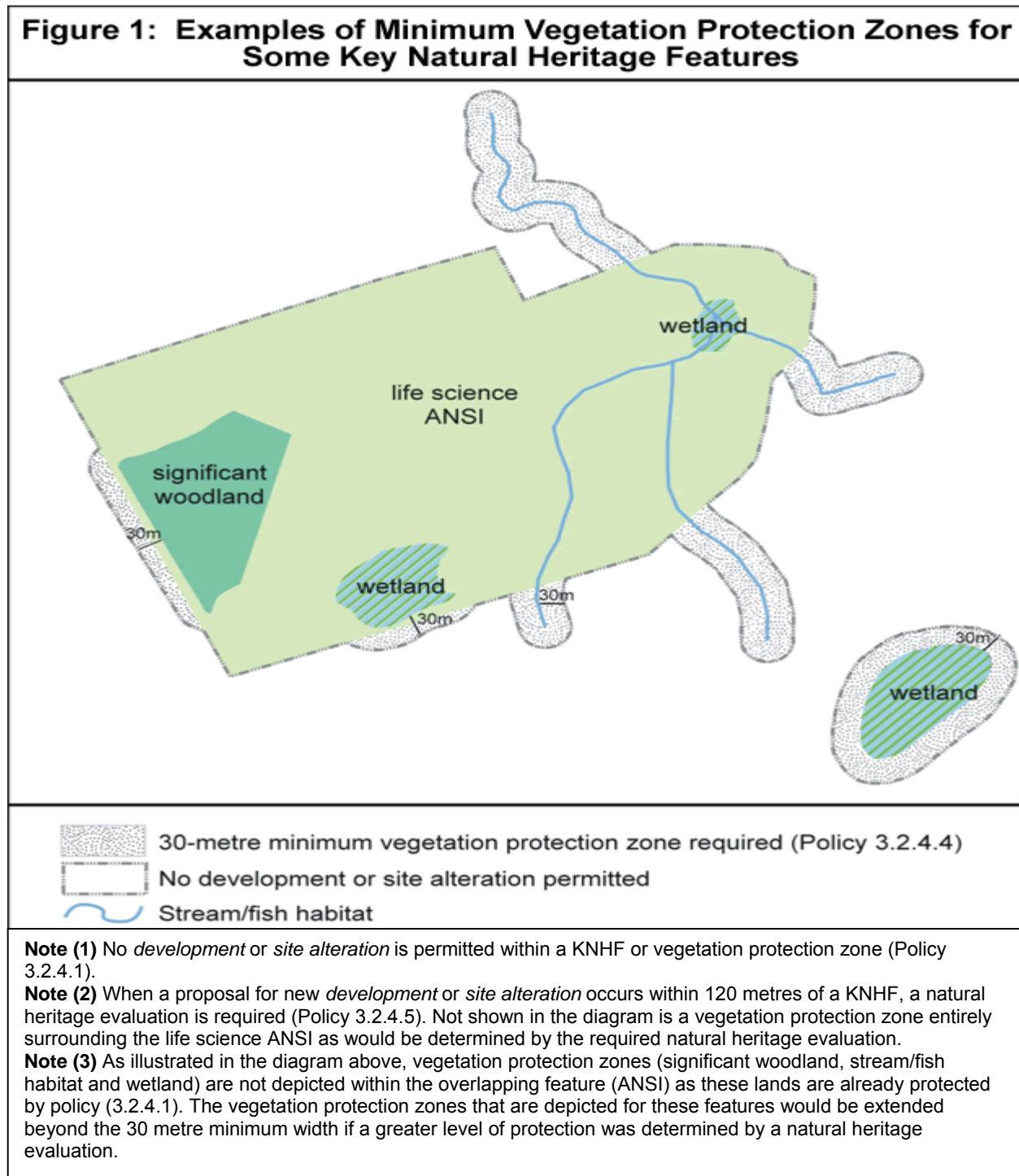
*“A vegetated buffer area surrounding a key natural heritage feature or key hydrologic feature within which only those land uses permitted within the feature itself are permitted. The width of the vegetation protection zone is to be determined when new development or site alteration occurs within 120 metres of a key natural heritage feature or key hydrologic feature, and is to be of sufficient size to protect the feature*



and its functions from the impacts of the proposed change and associated activities that will occur before, during, and after, construction, and where possible, restore or enhance the feature and/or its function.”

As noted above, Section 3.2.4.4 of the Greenbelt Plan requires a minimum 30 metre vegetation protection zone for wetlands, seepage areas and springs, fish habitat, permanent and intermittent streams, lakes, and significant woodlands.

Examples of minimum vegetation protection zones for some KNHFs are depicted in Figure 1.





## 7.0 Criteria for Identifying and Delineating Key Natural Heritage Features

This section contains information on the identification and delineation of the following KNHFs: Significant habitat of endangered species, threatened species and special concern species; Fish habitat; Wetlands; Life science ANSIs; Significant valleylands; Significant woodlands; and, Sand barrens, savannahs, tallgrass prairies and alvars.

### 7.1 Significant Habitat of Endangered, Threatened and Special Concern Species

#### Definition of Feature

The Greenbelt Plan defines endangered, threatened and special concern species as species that are listed or categorized as endangered, threatened or special concern on the Species at Risk for Ontario (SARO) List, as updated and amended periodically.

The Greenbelt Plan also defines “significant” to mean:

*“in regard to the habitat of endangered species, threatened species and special concern species, the habitat as approved by the Ontario Ministry of Natural Resources, that is necessary for the maintenance, survival, and/or the recovery of naturally occurring or reintroduced populations of endangered species, threatened species or special concern species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle.”*

Other legislation pertaining to species at risk includes the *Ontario Endangered Species Act, 2007 (ESA, 2007)* that prohibits the damage or destruction of the habitat of threatened and endangered species in Ontario.

Under the *ESA, 2007* the Committee on the Status of Species at Risk in Ontario (COSSARO) has the responsibility for classifying species at risk in Ontario. Once assessed, species classified as special concern, threatened, endangered or extirpated are included through regulation on the Species at Risk for Ontario (SARO) List. In general, these are species at various degrees of risk of extinction or extirpation. Below are the *ESA, 2007* definitions for *endangered, threatened and special concern species*.

#### *Endangered*

*A species facing imminent extinction or extirpation*

#### *Threatened*

*A species that is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation*

#### *Special Concern*

*A species that may become threatened or endangered because of a combination of biological characteristics and identified threats.*

#### Feature Identification

The SARO List regulation can be obtained by visiting the MNR Species at Risk website (<http://www.ontario.ca/speciesatrisk>).

Information regarding the location of species at risk can be obtained from the Natural Heritage Information Centre (NHIC) website (<http://nhic.mnr.gov.on.ca/MNR/nhic/species/shapefile.cfm>).

The NHIC website provides the species name and generalized locations for many species at risk. Direct access to detailed species occurrence information is available from the NHIC database upon request on a need-to-know principle as some information contained in the database is considered 'sensitive'. Additional information may also be obtained from MNR district offices.

For certain sensitive species, the occurrence is flagged as 'data sensitive' (e.g., American Ginseng) and the user must seek more detailed information from the local MNR district office. Some conservation authorities and municipalities may also have access to sensitive species information.

In order to gain permission to access sensitive data information, data sensitivity training must be completed and data access agreements signed with NHIC. For more information on data sensitivity training and data access agreements, contact the NHIC, 300 Water Street, Peterborough ON, K9J 6Y3 (☎ 705-755-2159).

### **Process for Identifying, Mapping and Determining Significant Habitat of Endangered, Threatened and Special Concern Species**

MNR is responsible for approving significant habitat of endangered, threatened or special concern species. Guidance on delineating habitat for species at risk in Ontario will be available in the future. In the interim, significant habitats will be delineated based on the process that is outlined below.

#### **Step 1: Identify Occurrences of Endangered, Threatened and Special Concern Species**

Identify whether occurrences of endangered, threatened or special concern species occur within or adjacent to the subject lands. Comprehensive mapping of habitat for many species at risk is not available. Thus, the recommended process is to 'screen' an application by checking for any occurrences within or adjacent to the subject lands. A species occurrence is simply a location where an endangered, threatened or special concern species is known to occur. It does not necessarily identify the complete habitat that is used and required by that species.

The general location of occurrences of endangered, threatened and special concern species can be derived from:

- Information provided by the NHIC website and MNR district offices. Species occurrence records are known as 'Element Occurrences' (EOs) on the NHIC website and on any mapping provided by MNR for the Greenbelt Plan area. EO records indicate where a particular species has been observed but do not indicate

the exact location of the species nor the extent of their habitat. It is recommended that the area of search for known species occurrences should extend at least one kilometre beyond the property for species occurrences in case the significant habitat falls within the 120 metre area of the subject lands.

- Species occurrences identified through a natural heritage evaluation carried out in accordance with Subsection 3.2.4.5 of the Greenbelt Plan, or an ecological site assessment. Any information collected by such studies should be shared with the MNR.

Where new endangered, threatened or special concern species occurrences are found, this information should be submitted to the NHIC office in Peterborough and to the local MNR district office.

Where a species at risk occurrence (identified by MNR or another source and accepted by MNR as a valid occurrence) falls within 1 kilometre of the subject lands, proceed to Step 2.

## **Step 2: Map and Determine Significant Habitat of Endangered, Threatened or Special Concern Species**

The municipality or applicant will contact MNR to:

- determine whether more detailed information is needed on the species occurrence located on or adjacent to the property;
- determine whether additional studies are required to confirm the presence, status and health of the identified species; and,
- determine or confirm the extent of its significant habitat.

This step will result in mapping of significant habitat and a determination of whether the proposed *development* or *site alteration* encroaches upon significant habitat or is located within 120 metres of it. If the proposed *development* or *site alteration* is located within the boundaries of significant habitat, it is not permitted. If it is located within 120 metres of significant habitat, proceed to Step 3.

## **Step 3: Determine the Appropriate Vegetation Protection Zone**

The applicant will undertake a natural heritage evaluation that considers:

- whether the nature and type of the proposal is such that it could adversely affect the health of the species and its significant habitat; and
- whether a detailed mitigation plan is required to ensure no adverse effects occur on the identified species or its significant habitat.

The natural heritage evaluation will result in a recommendation for a vegetation protection zone that will be reviewed and approved by the planning authority.

### *Notes:*

- *In many instances, KNHFs and their associated vegetation protection zones may already afford adequate protection of the endangered, threatened or*

*special concern species in question. In other cases, the endangered, threatened or special concern species will require a larger protective zone. In some cases, MNR may request that there be further studies on a particular species or its habitat requirements before recommending protective measures for an endangered, threatened or special concern species.*

- *While the licence boundary for a mineral aggregate operation may be permitted immediately adjacent to significant habitat of endangered, threatened or special concern species, the limit of extraction for the operation will be set back a minimum of 15 metres from the licensed boundary. The need for a greater extraction setback may be determined through the studies that are required in connection with the Aggregate Resources Act (ARA) licence application process.*
- *Development proponents should be aware that they are responsible for ensuring compliance with the ESA, 2007.*

## **7.2 Fish Habitat**

### **Definition of Feature**

The Greenbelt Plan defines “fish habitat”:

*“As defined in the Fisheries Act, c. F-14, means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes (PPS, 2005).”*

### **Feature Identification**

Lakes, reservoirs, rivers, streams, ponds and many wetlands provide fish habitat. Intermittent and ephemeral streams and seasonally flooded areas can provide important habitat for some fish species at certain times of the year. In addition, in-water structures such as logs, stumps, rocks and bottom substrates; pools and riffle areas; riparian and aquatic vegetation; and ground water recharge/discharge areas provide habitat. Habitat includes the watercourses (including ditches and channelized streams) that act as corridors allowing fish to move from one area to another. Fish habitat provides food, cover and conditions for successful reproduction. Different species have different habitat requirements which can vary with the life stage, season and even the time of day.

### **Determining the Location of Fish Habitat:**

Where available, detailed fish habitat mapping and information may be provided by MNR, Department of Fisheries and Oceans Canada (DFO) and/or conservation authorities. This more detailed information should be used to determine the location of fish habitat and to help determine the appropriate level of fish habitat protection, or

Where no detailed fish habitat mapping has been completed, all waterbodies - including permanent or intermittent streams, headwaters, seasonally flooded areas, municipal or agricultural surface drains, lakes and ponds (except human-made off-stream ponds) - should initially be considered fish habitat unless it can be demonstrated to the satisfaction of the

planning authority under the *Planning Act* that the feature does not constitute fish habitat as defined by the DFO. This could be demonstrated by means of a report from a qualified professional (eg. fisheries biologist).

### **Establishing Vegetation Protection Zones for Fish Habitat:**

In the case of watercourses with no defined beds and banks, the minimum 30 metre vegetation protection zone is to be established on each side of the feature and measured from the centre line of the watercourse; or

In the case of lakes and non-meandering watercourses with defined beds and banks, the minimum 30 metre vegetation protection zone is to be measured from the *normal high water mark*; or

In the case of meandering watercourses, the minimum 30 metre vegetation protection zone is to be measured from the edge of the meander belt, the line that connects each outside curve/concave bank at bankfull stage.

In addition, an application for *development* or *site alteration* that is proposed within 120 metres of fish habitat, but beyond the minimum vegetation protection zone, must be accompanied by a natural heritage evaluation. This study, prepared in accordance with policy 3.2.4.5 of the Greenbelt Plan, may require a larger vegetation protection zone or design restrictions.

## **7.3 Wetlands**

### **Definition of Feature**

The Greenbelt Plan defines “wetlands” as:

*“Land such as swamp, marsh, bog or fen (not including land that is being used for agricultural purposes and no longer exhibits wetland characteristics) that:*

- a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface;*
- b) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants; and*
- c) has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.”*

### **Feature Identification**

In meeting requirement c) of the Greenbelt Plan definition of wetlands, the following criteria shall be used to further identify wetlands that are KNHFs for the purpose of applying the natural features policies of the Plan:

- all wetlands, regardless of size, evaluated as provincially significant in accordance with the Ontario Wetland Evaluation System (OWES) (Southern Manual, MNR 2002) and accepted by MNR;
- all other identified wetlands 0.5 hectares or greater in size; and
- all other identified wetlands less than 0.5 hectares in size except where it can be demonstrated to the satisfaction of the planning authority by a qualified person (such as a hydro-geologist or a person with equivalent qualifications) that the wetland does not constitute or provide one or more of the following features or functions:
  - a wetland feature having one or more of the following characteristics:
    - permanent or intermittent surface water connection between the wetland and an adjacent KHF;
    - significant recharge to the underlying aquifer (generally considered to be any small wetland underlain by at least 3 metres of mineral soil having a hydraulic conductivity of  $10^{-4}$  cm/s or more); or
    - direct hydraulic connections between the wetland and an underlying aquifer (e.g. along fracture zones or granular soil conduits);
  - an important groundwater hydrologic linkage to an adjacent KHF; or
  - an important component of, or ecological linkage to, an adjacent KNHF.

In accordance with Section 3.2.4 of the Greenbelt Plan, wetlands are identified as both KNHFs and KHFs. In order to meet the requirements of this section of the Greenbelt Plan, the above criteria can also be used for the purpose of identifying and delineating wetlands that are KHFs, including those wetlands that are located beyond the NHS. Other KHFs include permanent and intermittent streams, lakes, seepage areas and springs. In many cases, these other KHFs may coincide with KNHFs, including wetlands.

## Mapping of Wetlands

Wetlands may be identified and mapped through the following processes:

- wetlands evaluated or confirmed by the MNR in accordance with the OWES; and/or
- wetlands identified in mapping provided by MNR and the local conservation authority; and/or
- wetlands identified in a natural heritage evaluation or a hydrological evaluation under Section 3.2.4.5 of the Greenbelt Plan. (Note: Either the OWES or “Ecological Land Classification (ELC) for Southern Ontario” can be used to identify wetland communities)

Where the exact outer limit or extent of a wetland is contested, an OWES-trained evaluator shall use OWES procedures in the field to confirm the outside boundary of the wetland.

*Note:*

- *Greenbelt Plan Section 4.3.2 (“Non-Renewable Resource Policies”) prohibits new mineral aggregate operations and wayside pits and quarries in provincially significant wetlands. While the licence boundary for a mineral aggregate operation may be*



*permitted immediately adjacent to significant wetlands, the limit of extraction for the operation will be set back a minimum of 15 metres from the licensed boundary. The need for a greater extraction setback may be determined through the studies that are required in connection with the ARA licence application process.*

## **7.4 Life Science Areas of Natural and Scientific Interest (ANSIs)**

### **Definition of Feature**

The Greenbelt Plan defines life science ANSIs as “*area(s) that have been:*

- a) identified as having life science values related to protection, scientific study or education; and*
- b) further identified by the Ministry of Natural Resources using evaluation procedures established by that Ministry, as amended from time to time.”*

### **Feature Identification**

MNR identifies life science ANSIs and will provide available mapping to municipalities. MNR will continue to provide this information as additional ANSIs are identified in the future.

Life science ANSIs are significant representative examples of Ontario's biodiversity and natural landscapes including specific types of forests, valleys, prairies and wetlands, their native plants and animals, and their supporting environments. They contain relatively undisturbed vegetation and/or landforms, and their associated species and communities. ANSIs include the most significant and best examples of the natural heritage features in the province and many will correspond with other KNHFs such as wetlands, significant valleylands and significant woodlands.

The selection and evaluation of life science ANSIs has taken its direction from “A Framework for the Conservation of Ontario's Biological Heritage” (Beechey, 1980, also known as the Life Science Framework) and updates. The framework adopts a hierarchical approach for organizing ecological diversity that recognizes site regions and site districts (now referred to as “ecoregions and ecodistricts”) as the major ecological divisions in Ontario. Within a particular site district, finer-scale ecological units are used to determine the features and areas that should be represented (e.g., landforms, vegetation communities, etc.).

The best representative sites which do not occur within regulated provincial parks or conservation reserves can be considered to be provincially significant ANSIs. Regionally significant ANSIs are the “next best” natural areas that also meet the five evaluation criteria. In the context of the Greenbelt Plan, life science ANSIs include both provincially and regionally significant features.

The following five selection criteria are used to evaluate candidate life science ANSIs:

1. Representation - of geological themes or landform-vegetation features of an ecodistrict;
2. Condition – an assessment of the degree of human-induced disturbances;

3. Diversity - the number of high quality, representative features that exist within a site are assessed;
4. Other ecological considerations - ecological and hydrological functions, connectivity, size, shape, proximity to other important areas, etc.; and
5. Special features - such as populations of species at risk, special habitats, unusual geological or life science features and educational or scientific value.

## **Establishing Vegetation Protection Zones for Life Science ANSIs**

The vegetation protection zone for life science ANSIs is to be determined on a case-by-case basis through the preparation of a natural heritage evaluation in accordance with policy 3.2.4.5 of the Greenbelt Plan. The study area for the natural heritage evaluation is comprised of all lands that are located within 120 metres of the ANSI boundary.

Where wetlands, seepage areas and springs, fish habitat, permanent and intermittent streams, lakes and significant woodlands overlap an ANSI boundary, the natural heritage evaluation for the ANSI will need to address the vegetation protection zone requirements for these features (i.e. minimum 30 metres).

## **7.5 Significant Valleylands**

### **Definition of Feature**

The Greenbelt Plan defines “valleylands” as:

*“...a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year (PPS, 2005).”*

“Significant valleylands” are defined as being:

*“...ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of the Natural Heritage System of the Greenbelt Plan....”*

### **Feature Identification**

Valleys are linear, ecological systems that form the backbone of the watershed system and perform important ecological functions. It is suggested that approval authorities carefully assess their valleyland systems relative to the overall protection of natural heritage features.

A comprehensive municipal-wide assessment using the criteria contained in this section is the preferred approach for identifying significant valleylands, However, in the absence of such an assessment, planning authorities can apply the criteria contained in this section on a site specific basis.

Valleylands provide one or more of the following ecological functions:

- convey and provide short-term storage for storm and melt waters;

- perform key ecosystem functions such as nutrient and sediment cycling and transport;
- often contain springs and other seepage areas which are critical to the maintenance of stream flows and water levels within riverine wetlands, as well as to the maintenance of water quality within watersheds;
- provide important fish and wildlife habitat;
- often contain vernal pools and other wet habitats serving as essential breeding habitat for certain amphibians and invertebrates;
- form important natural linkages between different habitat features, providing important migration corridors; and
- provide a reservoir for biodiversity.

Significant valleylands include any of the features identified in any of the following three categories:

- all streams with well-defined valley morphology (i.e. floodplains, riparian zones, meander belts and/or valley slopes) of an average width of 25 metres or more; the physical boundary is defined by the stable top of bank (as defined by the conservation authority); or
- all *spillways* and ravines with the presence of flowing or standing water for a period of no less than two months in an average year. Such features must be greater than 50 metres in length; 25 metres in average width with a well-defined morphology (i.e. two valley walls of 15% slope or greater with a minimum height of 5 metres, and valley floor), and having an overall area of 0.5 ha or greater; or
- additional features beyond the ones described above that have been identified by the planning authority as providing one or more of the features or functions described in the table contained in Appendix A.

## 7.6 Significant Woodlands

### Definition of Feature

The Greenbelt Plan defines “woodlands” as:

*“...treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas (PPS, 2005).”*

The Plan further defines “significant” as it applies to woodlands as:

*“... an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history...”*

## Feature Identification

For the purposes of applying Greenbelt Plan policies within the NHS of the Protected Countryside, “woodlands” are further defined as having either:

- (a) a *tree* crown cover of over 60% of the ground, determinable from aerial photography;  
or
- (b) a *tree* crown cover of over 10% of the ground, determinable from aerial photography, together with on-ground stem estimates of:
  - 1,000 *trees* of any size per hectare, or
  - 750 *trees* measuring over five centimetres in *diameter*, per hectare, or
  - 500 *trees* measuring over 12 centimetres in *diameter*, per hectare, or
  - 250 *trees* measuring over 20 centimetres in *diameter*, per hectare  
(based on *Forestry Act of Ontario 1998*).

For the purposes of (a) and (b), the tree amount is based on the average per hectare across the entire treed area. Woodlands experiencing changes such as harvesting, blowdown or other tree mortality are still considered woodlands. Such changes are considered temporary whereby the forest still retains its long-term ecological value.

## Mapping of Significant Woodlands

See Appendix B for additional details on how to delineate a woodland.

The Greenbelt Plan indicates that municipalities will have maps available showing known KNHFs, including significant woodlands, and associated minimum vegetation protection zones. Some of the criteria outlined below for determination of significance are more easily applied at a landscape scale and other criteria may need more detailed information. The significance of some woodlands can only be confirmed during site-specific assessments. This may involve a proponent applying the criteria and assessing woodland significance for review by the planning authority. Geographic Information Systems analysis may provide sufficient information for preliminary coarse-level mapping.

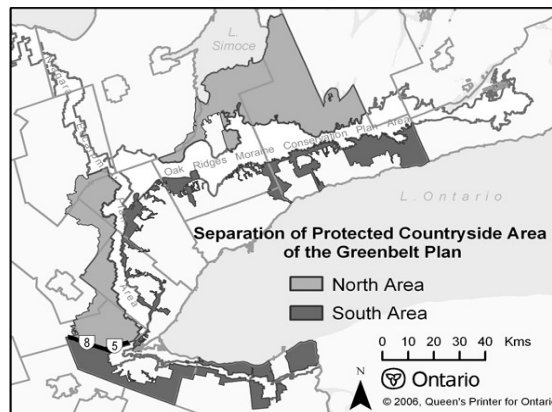
A minimum 30 metre wide vegetation protection zone shall be established from the outside boundary of significant woodlands which is measured from the drip line of the *trees*. A proposal for new *development* or *site alteration* within 120 metres of a significant woodland within the NHS requires an evaluation to identify any extension beyond the 30 metre minimum vegetation protection zone sufficient for the protection and maintenance of the feature and its functions.

## Significant Woodland Criteria

For identification of significant woodlands within the NHS of the Protected Countryside, the Greenbelt Plan area has been divided into two geographic areas to account for differences in forest cover (see the enlarged map in Appendix C).

**North Area:** includes the areas north of the ORMCP Area, west of the Niagara Escarpment Plan Area and north of Highways #5 and #8.

**South Area:** includes the areas south of the ORMCP Area, east of the Niagara Escarpment Plan Area and south of Highways #5 and #8.



A woodland that meets any one of the criteria below is considered significant\*.

Criteria	Description	North Area **	South Area ***
Size	Any woodlands of this size or greater are significant; or	10 hectares or more	4 hectares or more
Natural Composition	Any woodlands containing this area of naturally occurring (not planted) <i>trees</i> listed in the table in Appendix D that meet the definition of woodland; or	4 hectares or more	1 hectare or more
Age or Tree Size	Any woodlands of this size with either: a) 10 or more <i>trees</i> per ha that are either greater than 100 years old or 50 cm or more in <i>diameter</i> , or b) containing a <i>basal area</i> of at least 8 square metres per hectare in native <i>trees</i> that are 40 cm or more in <i>diameter</i> , or	4 hectares or more	1 hectare or more
Proximity	Any woodlands of this size wholly or partially within 30 metres of a: significant wetland; significant habitat of an endangered or threatened species; significant woodland; or	4 hectares or more	1 hectare or more
Rarity	Any woodlands of this size containing: a provincially rare treed vegetation community with an S1, S2 or S3 in its ranking by the MNR's NHIC; or habitat of a woodland plant species with an S1, S2 or S3 in its ranking or an 8, 9, or 10 in its Southern Ontario Coefficient of Conservatism by the NHIC, consisting of 10 or more individual stems or 100 or more square metres of leaf coverage.	0.5 hectare or more	0.5 hectare or more

\* In applying the criteria in the chart, a significant woodland must have an average minimum width of 40 metres measured to crown edges where the criterion size threshold is 0.5 to 4 hectares, and 60 metres where the criterion size threshold is 10 hectares.

\*\* If a lower/single tier municipality in the “North Area” has 15% or less woodland cover on average across its entire jurisdiction, then the criteria in the “South Area” apply for that municipality.

\*\*\* If a lower/single tier municipality in the “South Area” has less than 5% woodland cover on average across its entire jurisdiction, the 4 ha or more size criterion becomes 2 ha or more, and the 1 ha or more criteria become 0.5 ha or more for that municipality.

### Exceptions to Significant Woodlands

Notwithstanding the criteria listed in the section above, significant woodlands do NOT include:

- a *plantation* managed for production of fruits, nuts, Christmas *trees* or nursery stock;
- a *plantation* managed for tree products with an average rotation of less than 20 years (e.g. hybrid poplar or willow);
- a *plantation* established and continuously managed for the sole purpose of complete removal at rotation, as demonstrated with documentation acceptable to the planning authority or the MNR, without a forest restoration objective; or
- elongated woodland fingers less than 200 metres wide in the North Area, as long as:
  - a. they do not contain *trees* greater than 100 years old or a *basal area* of at least 8 square metres per hectare in native *trees* that are 40 cm or more in *diameter*;
  - b. they do not qualify on their own as significant woodlands;
  - c. they are not formed by indentations in the woodland (that are 20 metres or less wide as illustrated in Appendix B);
  - d. their removal does not divide one woodland into two;
  - e. their removal does not physically affect the significance characteristics of the remaining woodlands; and
  - f. the analysis of a) to e) above is done at a detailed site level.

Additional exclusions may be considered for communities which are dominated by the invasive non-native *tree* species Buckthorn (*Rhamnus* species) or Norway Maple (*Acer platanoides*) that threaten good forestry practices and environmental management. Such exceptions may be considered where native *tree* species cover less than 10% of the ground and are represented by less than 100 stems of any size per hectare.

### **Significant Woodlands Criteria and Non-Renewable Resources**

Subject to specific maintenance and rehabilitation provisions, Section 4.3.2.3a of the Greenbelt Plan allows for possible approval of new mineral aggregate operations and wayside pits and quarries within those portions of significant woodlands deemed to be *young plantation* or *early successional habitat*. This recognizes the importance of mineral aggregate resources close to markets and the potential to rehabilitate sites such that features will be maintained or restored and, to the extent possible, improved.

Delineation of *young plantation* or *early successional habitat* may be possible within some woodlands containing a mixture of successional stages. This would be subject to approval through the aggregate licensing process.

Section 4.3.2.3a of the Greenbelt Plan applies only to new mineral aggregate operations (i.e. no physical or operational linkage to an existing ARA licence). Expansions of existing mineral aggregate operations are not subject to the Section 4.3.2.3a prohibitions. Expansions may be permitted in significant woodlands as defined by the criteria contained in this paper according to the applicable Greenbelt Plan policies (Section 4.3.2.3d), only if the related decision is consistent with the PPS. The rehabilitation provisions in Section 4.3.2 of the Greenbelt Plan will also apply.

While the licence boundary for a mineral aggregate operation may be permitted immediately adjacent to significant woodlands, the limit of extraction for the operation will be set back a minimum of 15 metres from the licensed boundary. The need for a greater extraction setback may be determined through the studies that are required in connection with the ARA licence application process.



## 7.7 Sand Barrens, Savannahs, Tallgrass Prairies and Alvars

### Definition of Features

The Greenbelt Plan defines sand barrens, savannah, tallgrass prairies and alvars as follows:

Sand barrens “means land (not including land that is being used for agricultural purposes or no longer exhibits sand barrens characteristics) that:

- a. Has sparse or patchy vegetation that is dominated by plants that are:
  - i. Adapted to severe drought and low nutrient levels; and
  - ii. Maintained by severe environmental limitations such as drought, low nutrient levels and periodic disturbances such as fire;
- b. Has less than 25 percent tree cover;
- c. Has sandy soils (other than shorelines) exposed by natural erosion, depositional process or both; and
- d. Has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.”

Tallgrass Prairies “means land (not including land that is being used for agricultural purposes or no longer exhibits tallgrass prairie characteristics) that:

- a. Has vegetation dominated by non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire, or both;
- b. Has less than 25 percent tree cover;
- c. Has mineral soils; and
- d. Has been further identified, by the Minister of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.”

Savannah “means land (not including land that is being used for agricultural purposes or no longer exhibits savannah characteristics) that:

- a. has vegetation with a significant component of non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire, or both
- b. has from 25 percent to 60 percent tree cover;
- c. has mineral soils; and
- d. has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.”

Alvars are “naturally open areas of thin or no soil over essentially flat limestone, dolostone or marble rock, supporting a sparse vegetation cover of mostly shrubs and herbs.”

### Feature Identification

MNR identifies sand barrens, savannahs, tallgrass prairies and alvars and will provide available mapping of these features to municipalities. Lists of species relevant to these special communities can also be provided by MNR.

The identification of sand barrens, savannahs, tallgrass prairies and alvars can also be determined by using the ELC for Southern Ontario. The sand barrens, savannahs, tallgrass prairies and alvars, as defined in the Greenbelt Plan, are comprised of the Alvar Community Class, Sand Barren and Tallgrass (Prairies, Thicket, Savannahs and Woodland) units of the ELC system.

It should be noted that, because of the rarity of tallgrass prairie and tallgrass savannah, no minimum percentage vegetative cover of tallgrass prairie species within a community polygon is assigned within the Greenbelt area. It should be further noted that the vegetation characteristics of sand barrens specified in the Greenbelt Plan correspond to those of the only known ELC Sand Barren ecosystem in the Greenbelt area, the Open Sand Barren Community Series Unit. Also, the vegetation characteristics of savannahs in the Greenbelt Plan recognize both the Tallgrass Savannah and Tallgrass Woodland Community Series Units of the ELC.

It is estimated that known sand barrens, savannahs, tallgrass prairies and alvars constitute less than 0.1% of the area of the NHS in the Protected Countryside. Given the sensitive and unique features of these KNHFs, it is imperative that qualified individuals experienced in dealing with these special communities are engaged in the implementation of the Greenbelt Plan.

## **Sand Barrens**

Sand barrens are natural or naturalized communities occurring on open, bare sandy soils. The flora assemblage (or community) is unique enough to be distinguished from others, yet often contains species found in other habitats. While some are undoubtedly natural in origin, others may be the result of activities such as grazing or farming, which altered the original plant and soil cover. This original cover may have consisted of woodland, savannah or prairie.

Sand barrens are ecologically and floristically related to other communities on sandy areas or other extreme sites: Tallgrass Prairies, Tallgrass Savannahs, Sand Dunes and Rock Barrens.

Some typical Sand Barren species include Wormwood (*Artemisia campestris*), Umbrella Sedge (*Cyperus filiculmis*), Fernald's Sedge (*Carex merritt-fernaldii*), Sand Dropseed (*Sporobolus cryptandrus*) and Spikemoss (*Selaginella rupestris*).

Sand barren communities exhibit the following characteristics:

- open and bare sand, associated with historical or abandoned shorelines;
- old glacial lake plains and less than 25 % tree cover;
- occur in deep and nearly pure, fine, medium and coarse sandy areas;
- and,

- are typically associated with high elevation portions of the ORM, including abandoned shorelines and lacustrine deposits of the old glacial lake plains.

## Tallgrass Prairies and Savannahs

Tallgrass communities are recognized as a provincially rare type of vegetation. They have an affinity for the Great Lakes shoreline. However, in some cases, they occur on sandy nearshore areas and inland sand plains, particularly along post-glacial lake shorelines, as well as steep river bluffs where sandy substrates are common. The inland tallgrass communities are found primarily on droughty sand plains, moraines and sandy river bluffs. Many sites are very small in size. It is estimated that this vegetation has been reduced to 0.1 % of its original area prior to European settlement in the Greenbelt area.

Tallgrass communities are distinguished primarily by their unique assemblage of plant species - those that are characteristic of the Tallgrass Prairies in the eastern part of the North America grassland biome. Open Tallgrass Prairie has less than 25% tree and shrub cover. Tallgrass thicket has more than 25% shrub cover and less than 25% tree cover. Savannah has between 25% and 60% tree cover.

Species that best characterize Tallgrass Prairie habitat are grasses such as Big Bluestem (*Andropogon gerardii*), Little Bluestem (*Schizachyrium scoparium*) and Indian Grass (*Sorghastrum nutans*). Characteristic forbs include Wild Bergamot (*Monarda fistulosa*), Smooth Aster (*Aster laevis*), Black-eyed Susan (*Rudbeckia hirta*), Round-headed Bush-clover (*Lespedeza capitata*) and Showy Tick-trefoil (*Desmodium canadense*). Species vary between droughty, fire prone sites and those sites which are subject to spring flooding and summer drought with infrequent fires.

Savannahs have tallgrass species in the understory, and open grown *trees* forming a discontinuous canopy layer. On the more shaded sites, understory species include Pennsylvania Sedge (*Carex pennsylvanica*), Hay Sedge (*Carex foenea*), Bracken Fern (*Pteridium aquilinum*) and Woodland Sunflower (*Helianthus divaricatus*). Shrubs may also be prominent in all of these communities, especially if they haven't burned for some time. The most common are American Hazel (*Corylus americana*), Gray Dogwood (*Cornus racemosa*) and New Jersey Tea (*Ceanothus spp.*). The *trees* which characterize tallgrass areas are the oaks, hickories and pines. The wettest sites are dominated by Pin Oak (*Quercus palustris*), Swamp White Oak (*Quercus bicolor*) and Bur Oak (*Quercus macrocarpa*). On drier sites the principal *trees* are Black Oak (*Quercus velutina*), White Oak (*Quercus alba*), Pignut Hickory (*Carya ovalis*), White Pine (*Pinus strobus*), Red Pine (*Pinus resinosa*) and Red Cedar (*Juniperus virginiana*).

## Alvars

Alvars are naturally occurring open areas of thin soil over flat limestone bedrock. The unique plant assemblages present in alvar communities are adapted to and maintained by periodic flooding and extreme drought. They range from bare carbonate bedrock with cracks and fissures to shallow soils over bedrock with mostly less than 15cm of soil. Tree and shrub cover can vary from  $\leq 25$  to  $\leq 60\%$ .

Alvars are naturally maintained by any one or a combination of factors including seasonal and periodic drought, soil moisture extremes, temperature extremes, shallow soils, grazing and fire. Their shallow soils cannot retain enough water to last for more than a week or two without rain. Surface temperatures on bare rock can reach more than 50°C in the summer. Tree and shrub growth is restricted to areas of deeper soils or to places where tree roots can penetrate cracks in the bedrock. Herbaceous species have different strategies for surviving the cycles of drought and flooding on alvars. Many are annuals while others have two periods of growth, in the spring and fall, and become essentially dormant during the summer.

Some plant species which are narrowly confined to alvars are Cooper's Milkvetch (*Astragalus neglectus*), Early Fen Sedge (*Carex crawei*), Lance-leaved Coreopsis (*Coreopsis lanceolata*), Flat-stem Spike-rush (*Eleocharis compressa*), Wood Spurge (*Euphorbia commutata*), Prairie Smoke (*Geum triflorum*), Philadelphia Panic Grass (*Panicum philadelphicum*), Small Skullcap (*Scutellaria parvula*), Upland White Goldenrod (*Solidago ptarmicoides*), Northern Dropseed (*Sporobolus heterolepis*) and False Pennyroyal (*Trichostema brachiatum*). In addition to vascular plants, some mosses (e.g. *Scorpidium turgescens*) and liverworts (e.g. *Riccia sorocarpa*) are indicative of alvar communities.

## **8.0 Review of the Boundaries of Key Natural Heritage Features**

The boundaries of KNHFs may be fine-tuned by a planning authority based on new or more detailed information, provided:

- such reassessment is based on the criteria and definitions provided in this technical paper;
- in wetlands, (evaluated under the OWES procedures), life science ANSIs, and significant habitat of endangered, threatened and special concern species, the findings of the new information are confirmed by the local MNR District Office; and,
- in the case of fish habitat, the findings of the new information are provided by MNR or provided/approved by DFO or a delegated authority of DFO, as appropriate.

## **9.0 Roles and Responsibilities in the Implementation of this Technical Paper**

Planning authorities are responsible for the application and interpretation of this technical paper as it applies to planning and development applications. This includes the review and approval of any information submitted by the applicant.

Approval and confirmation by any other agency (i.e. MNR, DFO, conservation authorities) is only required where specifically identified as a requirement of this technical paper.

For the purposes of this technical paper, the 'planning authority' shall be the responsible municipal approval authority under the *Planning Act* unless otherwise stated.

## Appendix A

### Significant Valleylands Features and Functions

Criteria	Comments	Standards
<b>Landform-Related Functions and Attributes</b>		
Surfacewater functions	<ul style="list-style-type: none"> <li>Valleylands are areas of water conveyance, attenuation, storage and release.</li> <li>They are characterized by shifting patterns of erosion and deposition that result in short- and long-term cycles of change.</li> <li>The intent of this criterion is to recognize the significance of the “water/sediment conveyance function<sup>1</sup>” of watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>areas of water conveyance from catchment areas of 50 ha or greater, as defined by a stream channel conveying or holding water for at least two months of the year, or as defined by floodlines or by the meander belt width</li> <li>areas of active or historic erosion as characterized by exposed soils on shorelines, river banks, valley walls and instream islands</li> <li>areas of active or historic deposition characterized by alluvial soils forming bottomlands, terraces, levees and instream or river-mouth deltas or islands</li> <li>associated wetlands important to water attenuation, storage and release</li> </ul>
Groundwater functions	<ul style="list-style-type: none"> <li>Valleylands may be characterized by areas of groundwater infiltration and areas where groundwater is released as springs, seepage slopes or as part of the maintenance of wetlands and the baseflow of streams or rivers.</li> </ul>	<ul style="list-style-type: none"> <li>areas contributing to groundwater infiltration; areas that make an important contribution to infiltration in the region</li> <li>areas of groundwater release (i.e., springs, seepage slopes, wetlands)</li> </ul>
Landform prominence	<ul style="list-style-type: none"> <li>Large, well-defined valleylands are often significant landscape features essential to the character of an area</li> </ul>	<ul style="list-style-type: none"> <li>areas with well-defined valley morphology (e.g., floodplains, meander belts, valley slopes) having an average width of 25 metres or more</li> <li>valleylands with boundaries defined on the basis of standard procedures such as those in the natural hazards technical guides (see <a href="#">section 15.6</a>)</li> </ul>
Distinctive geomorphic landforms	<ul style="list-style-type: none"> <li>Action of water within valleylands can lead to the development of distinctive landforms within the landscape.</li> </ul>	<ul style="list-style-type: none"> <li>distinctive landforms based on their representation of geomorphological processes and features, quality and rarity</li> <li>features such as oxbows, bottomlands, terraces, deltas, exposed soil strata or eroding slopes along riverbanks or valley walls</li> </ul>
<b>Ecological Features</b>		
Degree of naturalness	<ul style="list-style-type: none"> <li>Valleylands that are relatively undisturbed have greater natural</li> </ul>	<ul style="list-style-type: none"> <li>areas of contiguous woodland, wetland and/or meadow considered cumulatively</li> </ul>

<sup>1</sup> The measure and threshold may be associated with the volume of water/sediment transported and the ecological significance of the water/sediment contribution to the valleyland. The scientific literature does not provide a simple measure due to complex factors of terrain/slope, soil type, precipitation regime, groundwater level, vegetation cover, etc. that influence water/sediment conveyance for any one watercourse. The recommended standards are a starting point for the consideration of significance.

Criteria	Comments	Standards
	<p>heritage value than disturbed valleylands.</p> <ul style="list-style-type: none"> <li>Valleylands that have a high proportion of natural vegetation cover also help buffer waterbodies from the effects of agricultural land use and urban development.</li> </ul>	<ul style="list-style-type: none"> <li>the proportion of valleyland that has natural vegetation cover vs. a cultural use (e.g., golf course, landscaped parkland, agricultural field, urban area) <ul style="list-style-type: none"> <li>greater than 25% natural vegetation cover should be considered significant</li> </ul> </li> <li>proportion of valleyland that has natural riparian vegetation</li> <li>riparian vegetation greater than 30 metres in width on each side of surfacewater features should be considered significant</li> <li>assessment of Floristic Quality Index (FQI) score (Oldham et al., 1995) <ul style="list-style-type: none"> <li>high FQI in the context of the local watershed should be considered significant</li> </ul> </li> </ul>
Community and species diversity	<ul style="list-style-type: none"> <li>Valleylands are characterized by diverse topography, soils, exposure, and moisture regimes, etc., which result in landscapes of high community and species diversity.</li> </ul>	<ul style="list-style-type: none"> <li>areas of high community and/or species diversity</li> </ul>
Unique communities and species	<ul style="list-style-type: none"> <li>Valleylands are characterized by micro-environments that may provide conditions for unusual communities and species.</li> <li>Valleylands tend to have a greater proportion of natural areas than the surrounding landscape and as such protect rare communities and/or the habitat of rare species.</li> </ul>	<ul style="list-style-type: none"> <li>seasonally important habitats such as deer yards, migration stopovers, etc.</li> <li>high proportion of regionally and locally significant species</li> <li>rare communities or the habitat of rare species, based on federal or provincial guidelines</li> </ul>
Habitat value	<ul style="list-style-type: none"> <li>Natural areas within valleylands and healthy aquatic systems are more valuable to wildlife than disturbed valleylands.</li> </ul>	<ul style="list-style-type: none"> <li>areas determined to provide important habitat required to sustain native aquatic and terrestrial species diversity within the region</li> </ul>
Linkage function	<ul style="list-style-type: none"> <li>Valleylands provide terrestrial and aquatic linkages within the watershed.</li> <li>Valleylands provide important corridors, allowing for the natural movement and dispersal of aquatic and terrestrial plants and animals.</li> <li>Maintaining linkages for plant and animal movement will help mitigate climate change impacts.</li> </ul>	<ul style="list-style-type: none"> <li>the proportion of the valleyland with continuous natural vegetation corridors with a minimum width of 100 metres</li> <li>areas with functional ecological connections to other natural areas within the watershed both inside and outside the valleylands</li> <li>areas that are determined to provide important wildlife corridors</li> </ul>

**Restored Ecological Functions**



Criteria	Comments	Standards
Restoration potential and value	<ul style="list-style-type: none"> <li>• Valleylands that have been altered extensively and cannot be restored are less valuable than those that can be restored.</li> <li>• Restoration of riparian vegetation should be considered, wherever possible, to provide a buffer for surrounding land, to provide natural linkage along valleylands and to enhance existing natural areas.</li> </ul>	<ul style="list-style-type: none"> <li>• where restoration will provide important ecological benefits such as linkage function, improvement of habitat for rare species, reduced fragmentation effects, and/or increased core natural areas should be considered significant</li> <li>• areas where restoration will provide a minimum 30 metres corridor of riparian vegetation on each side of surfacewater features</li> <li>• areas where the public is interested in assisting in the implementation of ecological restoration</li> <li>• areas that are in public ownership and that would benefit from restoration</li> <li>• areas where restoration would buffer existing natural areas from the effects of adjacent development</li> </ul>

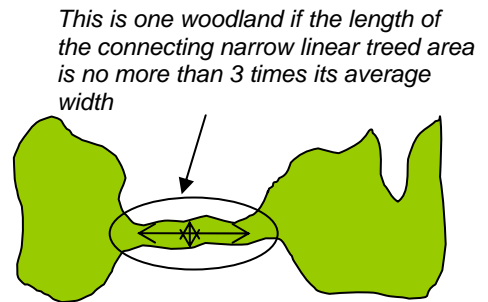
## Appendix B

### Details to Assist in Delineating Woodlands

Once appropriately delineated, these woodlands can then be evaluated for significance.

#### **When can treed areas be connected to be considered one Woodland?**

Where two larger treed areas (wider than the required minimum width) are physically connected by a narrow linear treed area (less than the required minimum width) with any open breaks being 20 metres or less across, all treed areas will be considered to be one woodland as long as the narrow linear treed area is no more than 3 times longer than its average width. As one woodland, its area would be the total of the two larger treed blocks as well as the connecting treed area.



*For Example: If the average width of the connecting linear treed area is 10 metres, then the maximum length of the connecting treed area must be no more than 30 metres (10X3) for all these treed areas to be considered as one woodland. If this connecting treed area is longer than 30 metres, the treed areas will be considered to be separate features and most of the connecting link could not be part of a significant woodland.*

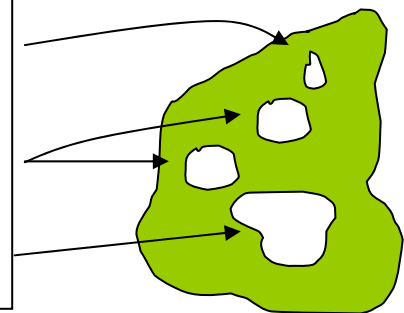
#### **Are Openings within Woodlands considered part of the woodland?**

Openings are treeless areas within a woodland. Developed openings with buildings or paved surfaces are not included in the calculated woodland area.

Internal undeveloped openings 20 metres or less in width are included in the calculation of woodland area. Internal openings more than 20 metres wide but less than 0.5 hectare in area would be included in the calculated woodland area provided that such openings collectively make up less than 25% of the total woodland area.

*For Example: In the woodland, openings that are 20 metres or less in width (and not developed) are all included in the measured woodland area.*

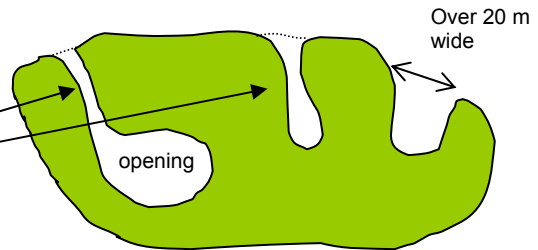
*Other openings that are more than 20 metres in width but still less than 0.5 ha in size are also included in the total woodland area if their sum is less than 25% of the total area. In cases where such openings would total more than 25% of the total woodland area, the largest openings are excluded from the woodland area until the sum of such openings is less than 25% of the total woodland area.*



## When Are Indentations into Woodlands considered part of the woodland?

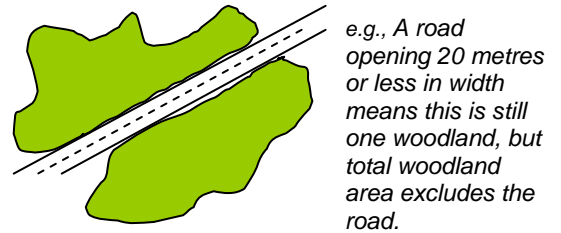
Indents that are 20 metres or less wide will be considered part of the woodland.

*e.g., Two of these indents are less than 20 metres wide and are considered part of the woodland. The third is too wide. One indent becomes wider than 20 metres inside the woodland and therefore becomes an opening.*

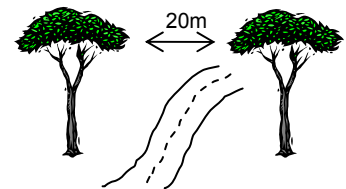


## When does a Separation divide a Woodland into two?

An opening more than 20 metres wide that bisects a woodland would be considered to create two separate woodlands. A bisecting opening 20 metres or less in width would not be considered to separate a woodland into two woodlands. However, the developed portion (e.g., public road or active rail line) of any bisecting opening will not be included in the woodland area calculation.

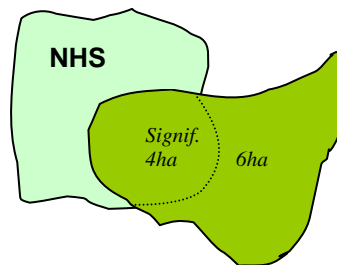


*e.g., Where branches of woodland trees stretch over a road to within 20 metres of each other, the woodland portions on both sides combine into one woodland.*



## Woodlands on the border of the NHS

Where a portion of a woodland lies outside the NHS, the delineation rules will be used to determine the woodland boundary and then the whole woodland shall be included in the area calculations for determining significance. Note: Other natural features outside the NHS in proximity to the woodland do not affect its evaluation for significance.

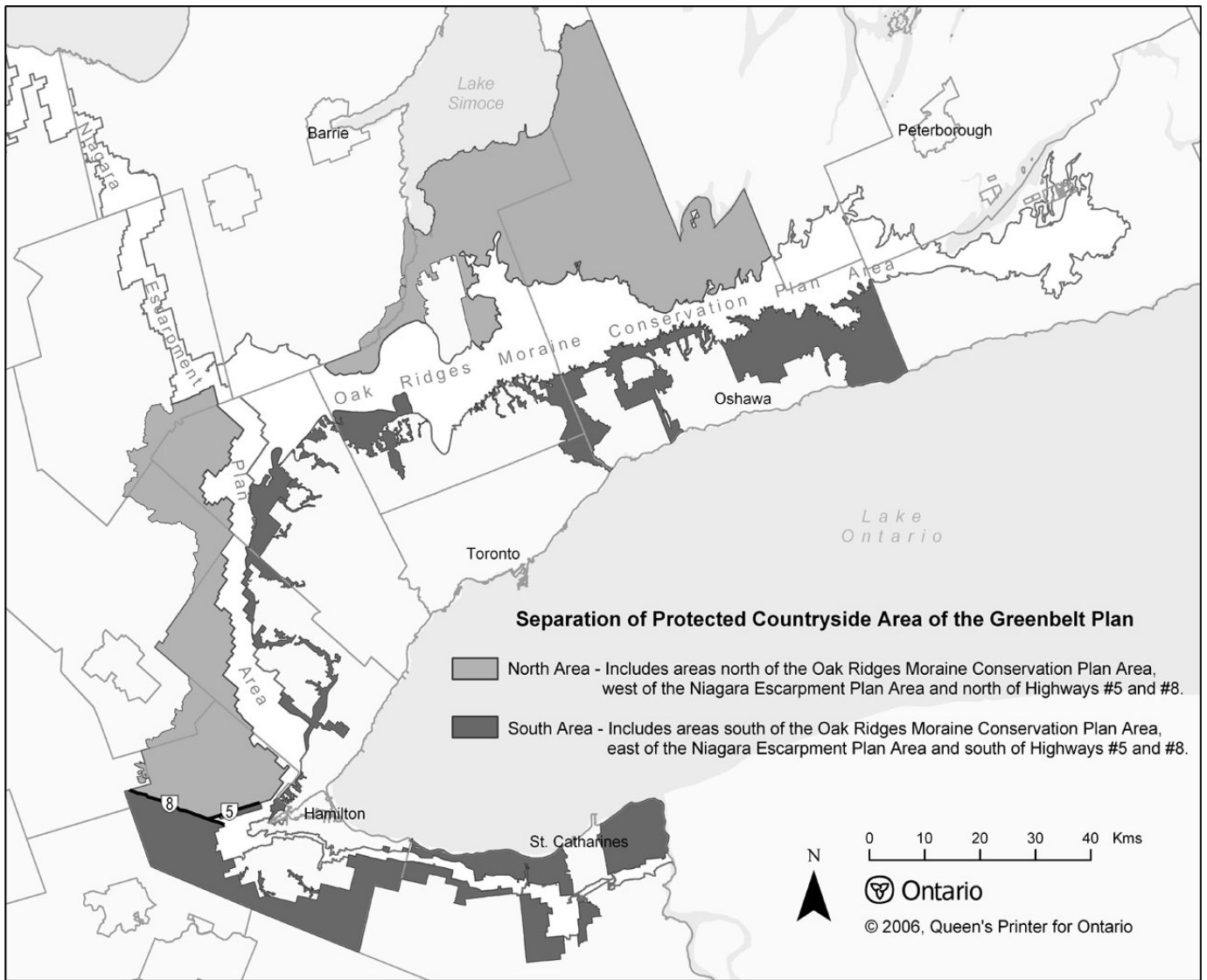


*e.g., A 4 ha part of a woodland is in the North area of the Greenbelt and within NHS while the other 6 ha part is outside the NHS. Since the total woodland area meets the minimum 10 ha criterion, the portion inside the NHS (4 ha) is considered significant. The portion outside may or may not be considered significant depending on the policies in that area.*

Note that the Greenbelt Plan only requires that the policies of Section 3.2.4 including a minimum 30 metre vegetation protection zone apply to the NHS areas only. Woodland features outside the NHS are subject to the PPS.

# Appendix C

## Areas for which Different Woodlands Size Thresholds Apply



## Appendix D

### Mid to Late Successional or Site-Restricted Tree Species

<i>Abies balsamea</i> - Balsam Fir	<i>Malus coronaria</i> - Wild Crabapple
<i>Acer nigrum</i> - Black Maple	<i>Morus rubra</i> - Red Mulberry
<i>Acer pensylvanicum</i> - Striped Maple	<i>Nyssa sylvatica</i> - Black Gum
<i>Acer rubrum</i> - Red Maple	<i>Ostrya virginiana</i> - Hop-hornbeam
<i>Acer saccharinum</i> - Silver Maple	<i>Picea glauca</i> - White Spruce
<i>Acer saccharum</i> - Sugar Maple	<i>Picea mariana</i> - Black Spruce
<i>Asimina triloba</i> - Pawpaw	<i>Pinus resinosa</i> - Red Pine
<i>Betula alleghaniensis</i> - Yellow Birch	<i>Pinus strobus</i> - White Pine
<i>Betula lenta</i> - Black Birch	<i>Platanus occidentalis</i> - Sycamore
<i>Carpinus caroliniana</i> - Blue-beech	<i>Ptelea trifoliata</i> - Hoptree
<i>Carya cordiformis</i> - Bitternut Hickory	<i>Quercus alba</i> - White Oak
<i>Carya glabra</i> - Pignut Hickory	<i>Quercus bicolor</i> - Swamp White Oak
<i>Carya laciniosa</i> - Shellbark Hickory	<i>Quercus ellipsoidalis</i> - Hill's Oak
<i>Carya ovata</i> - Shagbark Hickory	<i>Quercus macrocarpa</i> - Bur Oak
<i>Castanea dentata</i> - American Chestnut	<i>Quercus muehlenbergii</i> - Chinquapin Oak
<i>Celtis occidentalis</i> - Hackberry	<i>Quercus palustris</i> - Pin Oak
<i>Cephalanthus occidentalis</i> - Buttonbush	<i>Quercus rubra</i> - Red Oak
<i>Cornus florida</i> - Flowering Dogwood	<i>Quercus shumardii</i> - Shumard Oak
<i>Euonymus atropurpurea</i> - Wahoo Burning-bush	<i>Quercus velutina</i> - Black Oak
<i>Fagus grandifolia</i> - Beech	<i>Sassafras albidum</i> - Sassafras
<i>Fraxinus nigra</i> - Black Ash	<i>Sorbus americana</i> - American Mountain-ash
<i>Juglans cinerea</i> - Bitternut	<i>Staphylea trifolia</i> - Bladdernut
<i>Juglans nigra</i> - Black Walnut	<i>Tilia americana</i> - Basswood
<i>Larix laricina</i> - Tamarack	<i>Tsuga canadensis</i> - Hemlock
<i>Liriodendron tulipifera</i> - Tulip-tree	<i>Ulmus thomasii</i> - Rock Elm
<i>Magnolia acuminata</i> - Cucumber Magnolia	

#### Notes:

This list was compiled by considering the characteristics of each species and excluding any species with a coefficient of conservatism of less than 3, according to Oldham et al. (1995). Species on this list have limited natural regeneration in old fields and many (not all) have declined due to incompatible land uses. This list does not include some species that are difficult to identify in the field (hawthorns, willows, serviceberries, plums) although it is acknowledged that some of these species may be rare. The list also does not include species that regenerate readily after a period of non-forest use (poplars, white birch, white ash, red ash, white-cedar, red-cedar, white elm, cherries, staghorn sumac) or certain small species (mountain maple, witch-hazel, alternate-leaved dogwood, nannyberry, speckled alder), or non-native species. Natural hybrids should be considered to be in the same category as their parent species. This list is subject to revision.

## Appendix E

### Definitions

**Agricultural uses** means the growing of crops, including nursery and horticultural crops; raising of livestock; raising of other animals for food, fur or fibre, including poultry and fish; aquaculture; apiaries; agro-forestry; maple syrup production; and associated on-farm buildings and structures, including accommodation for full-time farm labour when the size and nature of the operation requires additional employment (PPS, 2005). [Greenbelt Plan, 2005]

**Basal area** means the cross-sectional area of tree stems at breast height, measured 1.37 metres above the ground. For woodlands, it is commonly expressed in square metres per hectare ( $m^2/ha$ ). Basal area can be determined in a woodland by sampling with a wedge prism or representative fixed-area plots. (For example, one square metre of basal area would be found in 127 trees that are 10 cm in diameter, or 20 trees 25 cm in diameter, or 8 trees 40 cm in diameter, or 5 trees 50 cm in diameter, or 3 trees 65 cm in diameter.)

**Development** means the creation of a new lot, a change in land use, or the construction of buildings and structures, any of which require approval under the Planning Act, or that are subject to the Environmental Assessment Act, but does not include:

- a) The construction of facilities for transportation, infrastructure and utilities used by a public body;
- b) Activities or works under the Drainage Act; or
- c) The carrying out of agricultural practices on land that was being used for agricultural uses on the date the Plan came into effect (PPS, 2005). [Greenbelt Plan, 2005]

**Diameter** (of trees) means the diameter of tree stems outside bark at breast height, measured 1.37 metres above the ground.

**Early successional habitat**, for the purposes of Section 4.3.2.3a of the Greenbelt Plan, is a previously non-wooded, currently regenerating area in which:

- (a) there is less than 2 square metres of basal area per hectare in trees that are 10 centimetres or more in diameter from any species listed in Table A; and
- (b) there is less than 2 square metres of basal area per hectare in trees that are 25 centimetres or more in diameter from any combination of species listed in Table A plus white ash (*Fraxinus americana*), black cherry (*Prunus serotina*), white-cedar (*Thuja occidentalis*), white elm (*Ulmus americana*) or red elm (*Ulmus rubra*).

**Normal High Water Mark** means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes it refers to those parts of the waterbody bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level). [Department of Fisheries and Oceans, 2009]



**Plantation** means a treed community in which the majority of trees have been planted or the majority of the basal area is in trees that have been planted, often characterized by regularly spaced rows. With time and forest management, natural regeneration can become established and eventually convert the community to natural forest.

**Rural areas** means lands in the rural area which are located outside settlement areas and which are outside prime agricultural areas (PPS, 2005). [Greenbelt Plan, 2005]

**Site alteration** means activities such as filling, grading and excavation that would change the landform and natural vegetative characteristics of land, but does not include:

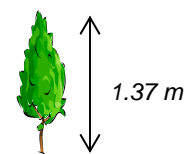
- a) The construction of facilities for transportation, infrastructure and utilities uses by a public body;
- b) Activities or works under the Drainage Act; or
- c) The carrying out of agricultural practices on land that was being used for agricultural uses on the date the Plan came into effect.

**Spillway** means well defined channels created by the concentrated flow of large volumes of water associated with glacial action.

**Top height** means the average height of the 100 largest trees per hectare (Haddon 1988).

**Trees** are woody plants (stems) of species able to reach unassisted a height of at least 4.5 metres (Farrar 1995).

Trees regenerating in formerly non-treed fields should reach breast height (normally measured as close to 1.37 metres from the ground as reasonable) to be counted in order to show successful emergence from the field herbaceous layer and the new woodland community should have a *top height* of at least 2 metres.



**Young plantation**, for the purposes of Section 4.3.2.3a of the Greenbelt Plan, means a plantation in which:


- (a) there is less than 4 square metres of basal area per hectare in trees that are 25 centimetres or more in diameter; and
- (b) if naturally occurring (not planted) trees in the plantation have become sufficiently established to constitute a woodland on their own, their coverage is not adequate by itself to raise the community out of the definition of “early successional habitat”.

## Appendix F


### Contact Information

#### MNR District Offices


##### ***Aurora District***

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##### ***Guelph District***

1 Stone Rd W  
Guelph ON N1G 4Y2  
 (519) 826-4955


##### ***Midhurst District***

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 (705) 725-7500

#### **Natural Heritage Information Centre**

Peterborough  
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P.O. Box 7000  
K9J 8M5  
 (705) 755-2159

#### **Land Information Ontario**

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## Appendix G

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