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**Niagara Escarpment Commission**

**Vegetation Protection Plan Technical Criteria**

**FINAL DRAFT**

**May 25, 2023**

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# BACKGROUND

A vegetation protection plan (VPP) is a two-dimensional plan drawing that identifies existing *vegetation units* (trees, shrubs, and other vegetation) on and/or adjacent to a development site, indicating which *vegetation units* will be impacted by proposed development, and specifying measures to protect and maintain those *vegetation units* in conformity with Niagara Escarpment Plan (NEP)[[1]](#footnote-1) objectives and policies.

Vegetation protection is a necessary part of maintaining and enhancing the natural environment of the Niagara Escarpment. In addition to the NEC’s criteria, municipalities and conservation authorities may have guidelines and requirements for vegetation protection. This document is to be read in conjunction with the NEP and other applicable municipal and conservation authority policies. It is the objective of the NEP and the Niagara Escarpment Planning and Development Act to protect natural heritage features and their functions and to preserve natural scenery and the open landscape character of the Escarpment landscape (see Appendix A).

# REQUIREMENT

A VPP may be necessary to determine if NEP policies are met. It may be required as part of a NEPDA Development Permit or other applications under the Planning Act and other provincial and federal legislation for proposed development within the Niagara Escarpment Plan Area.

A VPP will be required for applications where existing vegetation or a *vegetation protection zone* (VPZ) is present on or adjacent to the site of proposed development. Development that is proposed in or near *key natural heritage features* (KNHF), *key hydrologic features* (KHF), *vegetation protection zones* (VPZ), and natural heritage systems may trigger the need for an *environmental impact study* (EIS) or other study (e.g., hydrologic study). The VPP may be a component of that study and shall support the implementation of EIS recommendations to avoid or mitigate impacts on vegetation.

The determination that a VPP is necessary is made by NEC staff in consultation with other agencies. NEC staff will advise on whether the VPP must be submitted as a separate document, if it can be combined with a final site plan, or if it is to be a component of another study such as an EIS or *arborist report*. A VPP is similar to a *tree protection plan* but gives additional consideration to the protection of both trees and other types of *vegetation units* such as shrubs and herbaceous plants.

These technical criteria are intended to provide guidance for applicants on how to prepare a typical VPP. Specific criteria for each application should be confirmed in consultation with NEC staff and other government agencies. Where NEC criteria for landscape plans differ from those of other relevant government agencies, the most stringent requirements will apply.

# 3.0 EXPERTISE

The applicant must employ the services of a qualified professional with relevant expertise to prepare the VPP. Recognized certifications and qualifications include:

* Certified Arborist in good standing with the International Society of Arborists (ISA)
* Registered Professional Forester (RPF) in good standing with the Ontario Professional Foresters Association (OPFA)
* Landscape Architect in good standing with the Ontario Association of Landscape Architects (OALA)
* Ecologist/Certified Ecological Restoration Practitioner (CERP)

# STUDY AREA

The study area shall be confirmed with NEC and agency staff in consideration of the following:

* The study area shall include the proposed *development envelope* (limit of work) which encompasses all areas of the site that will be altered and all areas that will be used for construction access, stockpiling and storage of materials.
* The study area shall also include the area surrounding the *development envelope* extending a minimum of 6 metres from the limit of work. Note, in densely treed areas the study area may be extended up to 20 metres from the limit of work; in areas with the potential for species at risk (e.g., butternut) the study area may be extended up to 50 metres from the limit of work.
* Where applicable, the study area will extend 6 metres onto adjacent properties.

# VEGETATION UNITS

Trees, shrubs and other vegetation occurring within the study area are considered *vegetation units*. All *vegetation units* within the study area are to be included in the VPP, as follows:

* Individual trees, including those occurring in groupings or hedgerows, having a *diameter at breast height* (DBH) or 10 cm or more are to be individually tagged and surveyed for location and *dripline*.
* Densely treed or vegetated areas (such as shrub groupings or areas of naturally-occurring vegetation) may be described more generally – note, these are vegetated areas that do not qualify for a natural heritage evaluation or EIS (see Section 6.0). The *dripline* or outer edge of the vegetated area is to be surveyed. Unless otherwise directed, it is not necessary to survey and tag every tree within this vegetated area.
* Woody and herbaceous species identified as species at risk in Ontario found on site may necessitate additional study per the *Endangered Species Act*. Any butternut trees (*Juglans cinerea*) must be assessed by a certified butternut health assessor and follow the registration procedures set out by the Ministry of Environment, Conservation and Parks (MECP).

# VEGETATION PROTECTION ZONES (VPZ)

*Vegetation protection zones* (VPZ) are established to protect Significant Woodlands, Areas of Natural and Scientific Interest (ANSI), species at risk and their habitat, watercourses, wetlands, and slopes from the impacts of development. If a regulatory agency has identified a VPZ (e.g., a required setback from the *dripline* of a natural heritage feature) near the development site, the VPZ area shall be protected. The *dripline* or boundary of the feature may be staked in the field with an appropriate setback determined by relevant agency staff. The staked boundary and the required setback are to be shown on all mapping. Protective measures for the VPZ are to be included in the VPP.

# VPP PROCESS

Depending on the type of application, site conditions, and local regulations, the VPP process may include all or some of the following steps, as directed by NEC staff:

1. Inventory of vegetation units
2. Mapping
3. *Arborist report* (as needed)

## 7.1 Inventory

The inventory is to include both trees and other vegetation. All individually surveyed and tagged trees are to be recorded on a tree inventory chart showing the following information (see sample chart in Appendix B):

* Tree identification number
* Species (common and scientific names, including genus and species)
* *Diameter at breast height* (DBH)
* Condition, using the following ratings:
  + GOOD – dead branches less than 10%, signs of good compartmentalization on any wounds, no structural deficits
  + FAIR – 10-30% dead branches, size or occurrence of wounds present some concerns, minor structural defects
  + POOR – more than 30% dead branches, weak compartmentalization, early leaf drop, presence of insects or disease, major structural defects
  + DEAD – tree shows no signs of life
* Ownership (private, public)
* Action (retain, remove, transplant)
* Reasons (e.g., *hazard tree*, poor health, grading or construction impacts, etc.)
* Comments (e.g., prune)
* Proposed *minimum tree protection zone* (MTPZ), where applicable

For densely treed or vegetated areas, a general characterization of vegetation may be provided, as follows:

* Vegetation type (e.g., coniferous, deciduous, hedgerow, woodland, herbaceous groundcover, etc.) – note, it is not necessary to identify vegetation communities using Ecological Land Classification (ELC) protocols
* Species, species abundance, density, number of trees
* Condition of the trees and other vegetation
* Range of tree sizes (using DBH)

## 7.2 Mapping

The map is to be prepared to-scale (e.g., 1:500) and must clearly show the following information (see sample map in Appendix C):

* Location and *dripline* of individual trees with tree identification numbers
* Location and *dripline*/boundary of vegetated areas
* Symbol marking recommendation for each tree and/or vegetated area
* Location of proposed development including soil stockpiles, material storage, equipment access routes, and limit of work
* Location of all regulated vegetation protection zones (VPZ)
* Location of all above and below ground utilities (e.g., light standards, hydro poles, etc.)
* Location of all proposed protective barriers and mitigation measures (e.g., tree protection fence, silt fence, etc.)
* Tree inventory chart and characterization of vegetated areas
* Specifications for vegetation removal, vegetation protection measures and techniques (e.g., type of protective fencing, pruning, mulching, watering, etc.), timing of works, inspection/certification of works, invasive species management and clean equipment protocols, transplanting, monitoring, etc.)
* Title block with plan information (north arrow, written scale, bar scale, key plan, project address, NEC application number, date, revision number/date) and professional’s name, qualifications and contact information
* Map legend clearly identifying symbols, lines, and colours used on the map

## 7.3 Arborist Report

The VPP is often undertaken in conjunction with an *arborist report* where detailed assessment is required. An *arborist report* is a technical report prepared by a qualified tree professional that details specific and accurate information about trees, including but not limited to location, species, size, condition, structural integrity, disease, infestations and vitality, and identifies the nature of the work to be undertaken as well as appropriate tree protection and preservation methods to be implemented.Photos of existing vegetation may be required.

# SUBMISSION FORMAT

The VPP shall be prepared using AutoCAD or equivalent program with layout to-scale in metric and formatted as a PDF. The PDF document size is to match drawing size and must be legible when printed or viewed on a computer screen. Preferred size is 24x36 or ARCH D.

One digital copy (PDF) will be submitted to the NEC. A hard copy submission may be requested for review, particularly in the case of large format drawings or large drawing sets.

The approved VPP may be requested by conservation authorities or municipalities, in GIS format, when available, to update their mapping.

# VEGETATION PROTECTION

Development shall be carefully planned to avoid vegetation protection zones (VPZ), limit tree and vegetation removals, and minimize the long-term impacts of development on existing vegetation. Where avoidance is not possible it must be demonstrated that impacts can be mitigated through the application of *good arboricultural practices*.

Within VPZs and all other protected areas there shall be no construction; no altering of grade by adding fill, excavating, trenching, scraping, dumping or disturbance of any kind; no storage of construction materials, equipment, soil, construction waste or debris; no disposal of any liquids (e.g., concrete, gas, oil, paint); and no parking of vehicles or machinery.

**9.1 Types of Protective Barriers**

Protective barriers prevent physical harm to the trunk, canopy, and root zone of a tree or other vegetation that may result from site alteration, construction, and demolition activities and prevent access to an established VPZ. The appropriate type of barrier must be identified in the VPP in consideration of the following criteria (note that other agency criteria may apply):

* The standard light duty tree protection fence is a 1.2-metre high wire fence attached to 2.4 m long wood posts or steel T-bars installed at 2.4 m on-centre and reinforced at all corners.
* Heavy duty tree protection fence or tree hoarding (plywood) is an acceptable alternative and should be used where construction activities are proposed in confined areas or close to the barrier.
* Silt fence or exclusionary fence may be appropriate protective barriers in some circumstances and may be installed in parallel with tree protection fence where there is a need to protect vegetation in concert with controlling erosion and/or excluding wildlife from a construction site.
* Snow fencing is not an acceptable protective barrier.
* Straw bales, jersey barriers, or self-supporting fence may be acceptable barriers where subsurface conditions or seasonal constraints prevent the installation of posts and/or where post installation may impact vegetation or the root zone.

There may be some instances where protective fencing is not required. If there is a minimum setback of 10 metres from the regulated VPZ or the dripline of existing vegetation to be retained, then the development envelope may be defined by silt fencing or limit-of-work fence instead.

**9.2 Placement of Protective Barriers**

The roots of a tree can extend from the trunk up to three times the distance of the *dripline*. The VPP is to indicate the appropriate placement of protective fencing in consideration for the following:

* Protective fencing shall be provided in a continuous manner at the edge of an established vegetation protection zone (VPZ).
* For all other trees and vegetated areas on a site, protective fencing shall be provided in a continuous manner at a minimum of 1.0 metre outside of the *dripline* of existing trees or other vegetation to be retained. This is considered a minimum setback as the feeder root system of trees can extend well beyond the *dripline*.
* *Minimum tree protection zone* (MTPZ) measurements do not apply, unless they are shown to protect a larger area than the criteria above.
* In some situations, placement of the fencing at the limit of the *minimum tree protection zone* (MTPZ) may be acceptable. The largest possible tree protection zone is the preferred approach.
* For areas where both silt fence and tree protection fence are needed, fences are to be installed in parallel but separately to minimum impacts to the root zone of protected vegetation. To minimize impacts to the root zone that may result from standard silt fence installation, it may be necessary to lay the bottom on the silt fence on grade, securing the fabric in place with 150 mm of gravel.

**9.3 Other Protective Measures**

Proposed protective measures are to be consistent with *good arboricultural practice*, and may include, but not be limited to, the following:

* Wherever possible, the cutting of surface roots of trees to be retained should be avoided. If root cuts are necessary, they should be done quickly, making smooth, flush cuts under the supervision of a qualified professional. Exposed roots should be backfilled and watered before they dry out.
* Where equipment must pass within the root zone of trees or over vegetated ground (e.g., along haul routes, at construction entrances, etc.), weight dispersion mats or other techniques (e.g., mulch) may be required.
* Root cutting, canopy trimming, limb pruning, tree structure enhancement, and other maintenance measures such as watering and application of mulch is to be monitored by a Certified Arborist.

# REMOVALS AND REVEGETATION

In addition to being consistent with NEP policies, proposed vegetation removal must conform to applicable provincial legislation; municipal official plans, by-laws and guidelines; and conservation authority guidelines and regulations. Where vegetation removal or injury is proposed, the following criteria apply:

* Despite design work already completed by the applicant, revisions to the *site plan* may be required to minimize impacts to vegetation.
* Robust rationale explaining why vegetation removal/injury cannot be avoided is required.
* Vegetation removal techniques must be consistent with *good arboricultural practice*.

If all other *site plan* alternatives have been explored, and there is no option to avoid vegetation impacts, the VPP must consider how the site can be suitably restored and enhanced. Revegetation is critical for restoring the natural environment, buffering natural areas from the impacts of development, and in some cases, screening the visual impact of development on the Escarpment’s natural scenery. The following criteria apply to revegetation unless otherwise directed by NEC staff:

* All healthy trees, shrubs, and other vegetation that is proposed for removal is subject to replacement with native species on the same site.
* At a minimum, the NEC aims to replace all trees to be removed at a ratio of 1:1 (new trees to removed trees). Where standards vary, however, the most stringent criteria for replacement will apply. Replacement planting quantity will be determined by the regulatory agencies using the most appropriate method (e.g., *replacement ratio*, *per caliper formula*, *aggregate caliper formula*, etc.).
* There are no policies in the Niagara Escarpment Plan that allow for offsetting, compensation, and/or cash-in-lieu strategies for demonstrating no negative impact or net gain.
* Replacement plants are to be native to Ontario, grown from locally-sourced seed or cuttings, suited to the local growing conditions, and consistent with the local vegetation communities. Bush dug material will not be accepted.
* Minimum planting sizes will apply, as directed.
* Proposed replacement planting shall be identified on a landscape plan with a plant list, unless otherwise directed by NEC staff. Specific criteria for landscape plans will apply (e.g., professional qualifications, etc.). Refer to the NEC’s Landscape Plan Technical Criteria.

# 11.0 APPROVAL PROCESS

The typical VPP approval process follows these steps:

1. Pre-consultation with NEC staff is strongly encouraged. NEC staff will advise of any identified vegetation protection zones (VPZ) or other constraints or conditions to be met.
2. VPP submission is reviewed by NEC staff and may be circulated to other agencies, where a coordinated review is required. NEC staff may supply comments and advise on any required *site plan* changes or additional plans (e.g., landscape plan). Resubmission of the VPP may be required. Note, an incomplete VPP submission may delay this review or a decision on an application.
3. Once the VPP is approved by NEC staff and other agencies as necessary, the VPP will be incorporated into the set of permit documents. All other plans are to be coordinated with the VPP (e.g., grading plan, landscape plan).
4. If vegetation protection has been addressed to the satisfaction of NEC staff, and the VPP is deemed complete, the approval of the application may be subject to conditions, including but not limited to, implementation of the final VPP, vegetation replacement, certification, etc.

If vegetation protection has not been addressed to the satisfaction of NEC staff, staff may recommend refusal of an application, or in certain circumstances it may delay the issuing of permit until a satisfactory VPP is provided.

# IMPLEMENTATION OF THE VPP

Once the appropriate permits have been issued, all work shall be carried out as specified in the permit including the VPP. Any changes to the proposed work require NEC staff approval prior to implementation. The failure to undertake development in accordance with a Development Permit is an offence under the *Niagara Escarpment Planning and Development Act* (NEPDA). For best results, landowners and developers should provide all builders and subcontractors with a copy of the approved VPP before they start their work.

The following criteria apply to the implementation of the VPP and should be reflected in the VPP notes and details:

* No tree removal, vegetation clearing, or other site alteration is to commence until a permit and all other approvals are in place.
* Protective barriers shall be installed prior to the commencement of any construction.
* Trees should be felled so that they fall into the development envelope to avoid damage to other trees and vegetation.
* The applicant is responsible for ensuring that protective barriers remain in good condition throughout the construction period. If there is damage to a barrier, all work must stop until the barrier is properly repaired.
* Where construction activity results in the death or injury of vegetation proposed to be retained, replacement planting will be required. Required planting quantity will be determined by the regulatory authorities and may be calculated using a per caliper or *aggregate caliper method*. The most stringent criteria will apply.
* Protective barriers shall be maintained erect and in good repair throughout the duration of construction activity without breaks and unsupported sections and shall be removed upon completion of the work, unless otherwise specified by regulatory agencies.
* Subsequent to the completion of the works proposed in the VPP, a letter certifying that the work has been completed in accordance with the approved VPP shall be provided to the Niagara Escarpment Commission by a qualified professional.
* Additional agency requirements for verification letters, securities, and site inspections may apply.

# 13.0 GLOSSARY OF TERMS

**Aggregate caliper formula:** A method of determining tree replacement quantities that applies a depreciation factor for the pre-casualty health and structure of the tree(s) that have died.

**Arborist report:** A technical report prepared by a qualified tree professional which details specific and accurate information about trees, including but not limited to location, species, size, condition, structural integrity, disease, infestations and vitality, and identifies the nature of the work to be undertaken as well as appropriate tree protection and preservation methods to be implemented.

**Development envelope:** The total land area required to complete all of the proposed works including tree removal, construction staging and access routes, building, site alteration, and servicing. Development envelope is to be indicated on plan drawings.

**Diameter at breast height (DBH):** A measurement of the diameter of the tree trunk measured at a height of 1.4 m above the ground (or forest duff layer) on the uphill side of the tree. For a tree with multiple stems, DBH is the square root of the sum of the DBH of each stem.

**Dripline:** The location on the ground surface directly below the tips of the outermost branches of a tree or shrub.

**Environmental impact study (EIS):** A study that assesses the potential impacts to the features and functions of the natural environment from proposed development. Terminology varies across jurisdictions (e.g., environmental impact assessment, natural heritage evaluation).

**Good arboricultural practice:** Removal, planting, and tree maintenance activities that are in accordance with best management practices identified by the International Society of Arboriculture (ISA).

**Hazard tree:** A tree that poses a level of risk to people or property and that requires immediate removal, or other mitigating actions, to reduce the level of risk posed.

**Key hydrologic feature (KHF):** Within the meaning of the NEP, KHF include: permanent and intermittent streams, lakes, seepage areas and springs, and wetlands.

**Key natural heritage feature (KNHF):** Within the meaning of the NEP, KNHF include: wetlands, habitat of endangered species and threatened species, fish habitat, Life Science Areas of Natural and Scientific Interest, Earth Science Areas of Natural and Scientific Interest, Significant valleylands, Significant woodlands, Significant wildlife habitat, habitat of special concern species in Escarpment Natural and Escarpment Protection Areas.

**Minimum tree protection zone (MTPZ):** A minimum protection distance, measured in metres, from the outside edge of the tree base intended to protect anchor and transport roots of a tree. This measurement is derived from tree DBH rather than *dripline* and may not fully protect the feeder roots which can extend two to three times beyond the *dripline*.

**Per caliper formula:** The sum total DBH of all trees proposed to be removed or that have been injured or died during construction divided by the standard replacement tree caliper size (e.g., three 100 mm trees removed would be replaced with six 50 mm trees).

**Replacement ratio:** The relationship between the number of proposed replacement trees and the number of trees proposed for removal (e.g., 3 to 1, or 3:1).

**Site Plan:** A scaled, two-dimensional plan drawing that identifies the accurate location of proposed development and existing vegetation, structures, and utilities.

**Tree:** A woody plant that has a stem diameter of more than 10 cm when measured from the outside bark at a point 1.3 m above the ground.

**Tree protection plan:** A scaled, two-dimensional plan drawing prepared by a qualified professional in conjunction with an arborist report that identifies the accurate location, species, and size of trees and identifies the extent of injury or destruction, as applicable, and illustrates details of protection measures including the location of protective barriers.

**Vegetation protection zone (VPZ):** As defined in the NEP, a VPZ is 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.

**Vegetation Unit:** Trees, shrubs, and other vegetation found on or near the site of development.

# 14.0 NOTES

The Niagara Escarpment Commission (NEC) will, from time to time, update this document to reflect current policies, practices, and processes. The revision date will be noted on the document and the most current version will be available for download from the NEC website at [www.escarpment.org](http://www.escarpment.org).

# APPENDIX A: POLICY CONTEXT

Provincial Policy Statement (PPS)

The PPS (2020) calls for the long-term protection of natural features and areas and the maintenance of the long-term ecological function and biodiversity of natural heritage systems. Part 2.1 identifies that development and site alterations shall not be permitted in significant woodlands, wetlands, valleylands, wildlife habitat or Provincially Significant Areas of Natural and Scientific Interest (ANSIs), and adjacent lands, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Niagara Escarpment Plan (NEP)

The NEP is premised on a landscape approach to planning which seeks to maintain a system of interconnected natural areas, features and systems. Protection and restoration of vegetation at the site level is necessary to maintain structure and function at the landscape level.

The Purpose of the NEP provides for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment and ensures compatible development. The Objectives speak to the protection of unique ecologic areas, maintaining and enhancing the quality and character of natural streams and water supplies, and maintaining and enhancing open landscape character through compatible farming, forestry and by preserving natural scenery.

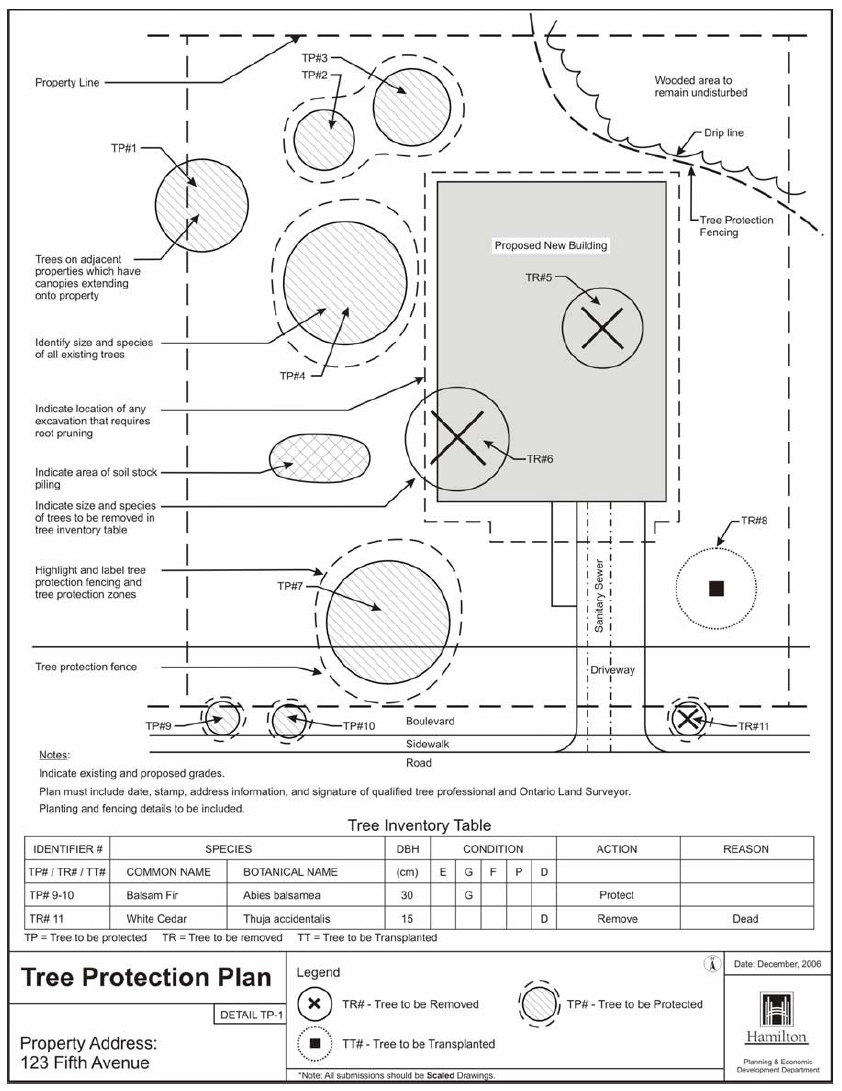
The protection of natural heritage features, scenic resources and open landscape character is also inherent in the designation objectives for Escarpment Natural, Escarpment Protection, and Escarpment Rural Areas. These resources include the mosaic of woodlands, hedgerows, agricultural fields and natural areas that form the Escarpment landscape. Land use designations that provide for more intensive forms of development (Minor Urban Centres, Urban Areas, Recreation Areas, Mineral Resource Extraction Areas) all contain policies calling for implementation approaches that minimize the impact of growth and development, minimize impact on natural heritage features and functions, and are compatible with the scenic resources and character of these areas.

Many Development Criteria (Part 2) deal with protecting, rehabilitating, and enhancing natural heritage features and minimizing the impact of development through erosion and sediment control, avoidance of slopes and natural hazards, landform conservation and protection of scenic resources. Part 2 policies include significant restrictions on development in key hydrologic and natural heritage features and provide strong protection for species at risk.

# APPENDIX B: SAMPLE TREE INVENTORY CHART

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tree #** | **Species** | **DBH** | **Condition** | **Ownership** | **Action** | **Reasons** |
| T1 | Sugar maple  (Acer saccharum) | 25 | Good | Private | Retain |  |
| T2 | Red oak  (Quercus rubra) | 15 | Poor | Private | Remove | Split trunk |
| T3 | White ash  (Fraxinus americana) | 30 | Poor | Private | Remove | Deadwood, crown dieback |

# APPENDIX C: SAMPLE VPP MAP

****Source: City of Hamilton Tree Protection Guidelines – City Wide (Revised October 2010)

1. Niagara Escarpment Plan (2017) as amended; Ontario; Order in Council No. 1026/2017; Office Consolidation December 21, 2018. Available for download at [www.escarpment.org](http://www.escarpment.org). [↑](#footnote-ref-1)