

# **MANAGED FOREST PLAN**



## **SENECA WOODLANDS**

**January 1, 2019 - December 31, 2038**

# MANAGED FOREST PLAN 2019-2038

## SENECA WOODLANDS

### Preamble

This plan addresses the different natural features on the property and the objectives of the landowners through an integrated resource management approach and within a realistic framework. With some appropriate management this plan can be realized, maintaining a healthy forest to be enjoyed by generations to come.

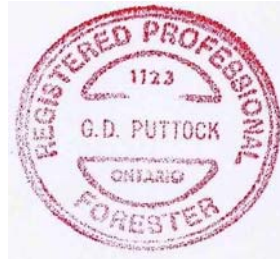
I hereby verify that the following forest management plan has been prepared in accordance with generally accepted sustainable forestry practices.



January 11, 2019

Date

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# MANAGED FOREST PLAN

## SENECA WOODLANDS

### Section 1 : Property Owner Information

#### Overview & Plan Period

This managed forest plan provides detailed inventory and mapping of the property's vegetation communities, infrastructure such as trails and access points, as well as trail amenities such as benches, board walks and bridge water crossings. It also identifies and quantifies the location of invasive species. The plan is intended to support future planning for environmental protection, biological diversity, recreation, nature appreciation, wildlife, forest products and investment objectives for the next 20 years, January 1, 2019 - December 31, 2038. Recommended management activities are provided for the ten-year period, January 1, 2019 to December 31, 2028.

#### 1.1 Registered Property Owners

Seneca College- King Campus  
13990 Dufferin Street  
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#### 1.2 Plan Author

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[www.invasiveinsects.ca](http://www.invasiveinsects.ca)

## Section 2 : Property Location Information

### 2.1 Property Location

ROLL NUMBER	LOCATION	AREA SUMMARY		
		TOTAL (ha)	FOREST (ha)	CONSERVATION LAND (ha)
1949 000 024 86000 0000	CON 3 PT LOTS 11-14 TOWNSHIP OF KING REGIONAL MUNICIPALITY OF YORK	284.50	122.56	0

### 2.2 Federal, Provincial and Local Policies and Regulations

The management programs contained in this plan will adhere to all federal, provincial and local policies and regulations. Activities will be implemented according to "Good forestry practices" as per the Provincial Forestry Act and will conform to York Region's Forest Conservation By-law.

*Good Forestry Practices* as defined in the Forestry Act means "the proper implementation of harvest, renewal and maintenance activities known to be appropriate for the forest and environmental conditions under which they are being applied and that minimize detriments to forest values including significant ecosystems, important fish and wildlife habitat, soil and water quality and quantity, forest productivity and health and the aesthetics and recreational opportunities of the landscape."

Forest management activities will conform to guidelines noted in professional documents such as "A Silvicultural Guide to Managing Southern Ontario Forests" (OMNR 2000) and the "Ontario Tree Marking Guide, Version 1.1" (OMNR 2004).

Some other relevant policies and legislation that will help guide stewardship of the property include,

- Federal Fisheries Act
- Federal Forestry Act
- Federal Species at Risk Act
- Federal Pest Control Products Act
- Federal Migratory Birds Convention Act
- Prov. Endangered Species Act
- Prov. Fish and Wildlife Conservation Act
- Prov. Greenbelt Act
- Prov. Professional Foresters Act
- Prov. Weed Control Act
- Prov. Lakes and Rivers Improvement Act
- Prov. Conservation Authorities Act
- Prov. Planning Act
- Prov. Oak Ridges Moraine Conservation Act
- Prov. Assessment Act.
- Prov. Accessibility for Ontarians with Disabilities Act.

## Section 3 : Property History

### 3.1 History and Activities

Seneca College King Campus is a 284-hectare (703 acres) property located four kilometres north of King City, Ontario. The property and surrounding land has a rich and diverse history dating back to before the turn of the century.

In 1920, Sir John Craig and Lady Flora McCreia Eaton, at the behest of their friend Sir Henry Mill Pellatt (of Casa Loma fame) who owned adjacent lands, purchased several parcels of lands—from early King Township pioneering farmers from the Ferguson family. Over time, the Eaton's acquired additional lands including land owned by Sir Henry Mill Pellatt. In 1924, two years after the death of Sir John, Lady Eaton built a country retreat home (Villa Fiori or House of Flora) which was constructed utilizing one of the original Ferguson farm-homes on the property. Construction on the current Eaton Hall began in the spring of 1938. In 1940, Lady Eaton moved into her newly built, 72-room, Norman, Gothic-style estate-home where regular family gatherings and other social events took place. Several heritage buildings dating back to the 1920's still exist on the property, including a barn that was built when Sir Henry Mill Pellatt owned the parcel. In 1971 Seneca College purchased this large estate from the Eaton family following Lady Eaton's death and established its King Campus.

In 1972 Seneca College, in collaboration with the Ministry Of Natural Resources, developed a planted area with Hybrid Poplar trees that was used to improve the efficiency of a wastewater spray field. The design was based on the concept of evapotranspiration, the process of transferring water from the soil by the absorption through the tree roots and evaporating the water through the leaves of the trees. This design was part of the requirements that was approved for the certification of the spray field from the Ministry Of Environment.

The King Campus is a mosaic of diverse forests, wetlands, vernal pools, grasslands, and agricultural fields as well as college buildings, farm buildings, and roads/parking lots. The property includes Lake Seneca (as it was registered with the Ministry of Natural Resources on May 11, 1994), a natural kettle lake, that was formerly known by no less than five other names.

Small vernal pools, such as this in one of the bottomland forest communities provide habitat for forest amphibians. >>>



Approximately 43% (122.56 hectares) of the property is forested. There does not appear to have been any previous silvicultural management in the forested areas. Areas that were previously used as farmland are being reforested or converted to natural grassland habitats, landscaped areas, and campus buildings and infrastructure. Agricultural fields occupy approximately 10% of the property. The fields are leased to farmers.

There are numerous hiking trails, including a section of the Oak Ridges Trail, throughout the property. Trails are regularly maintained, the boardwalks and bridges are in good condition, hazardous trees are routinely removed, numerous portable washrooms are available for use, and educational signs are installed.

Seneca College King Campus is working towards being a self-sustained property, where even the water is recycled and re-used on site. Seneca was recently awarded substantial provincial funding to revitalise the campus by constructing additional student housing and facilities.

## **3.2 The Surrounding Landscape**

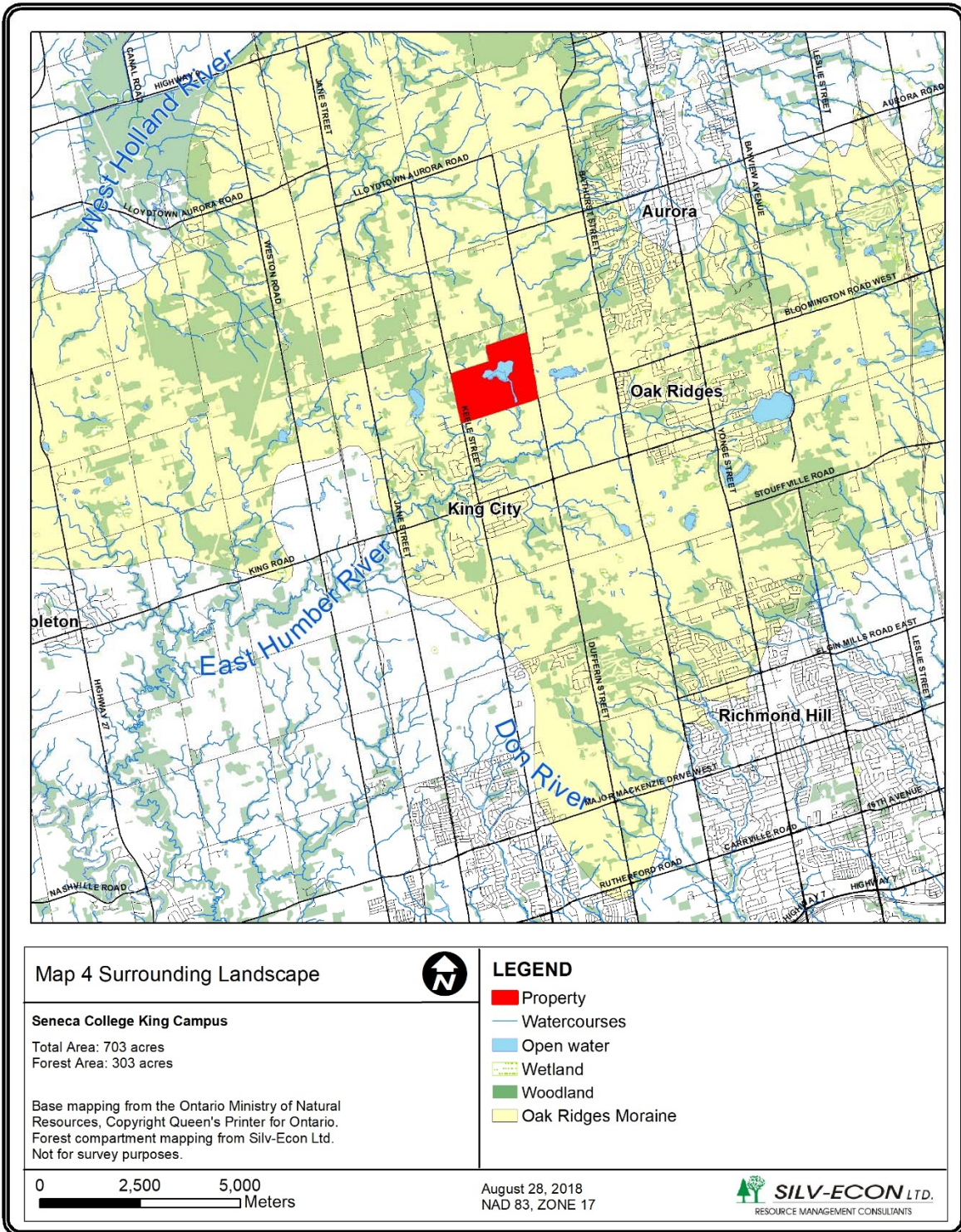
The landscape around the King Campus is a mosaic of agricultural lands, woodlands, wetlands and kettle lakes, and residential areas. The King Campus lies at the north end of the Lake Ontario watershed. The numerous kettle lakes, ponds, and streams in the Township of King flow southwards and form the headwaters of the Humber River, which empties into Lake Ontario. Lake Seneca is a good example of one of many typical, shallow-bottomed kettle lakes in the area. The wetlands and streams display the typical characteristics of the surrounding area: the waters are murky and slow-flowing; there are inundated cedar swamps, and vernal pools.

The property is situated on the Oak Ridge Moraine (ORM) and within Ontario's Greenbelt. ORM land designations for the property include natural core areas, natural linkages, and countryside landscapes. The forest cover at the Seneca Woodlands is significant because it contains patches of old growth forest and wetlands and adds to the limited forest cover in the area. A section of the Oak Ridges Trail crosses the northern part of the property.

The King Campus is situated within the Eaton Hall-Mary-Hackett Lakes Wetland Complex. This complex contains several kettle lakes, swamps, and wetlands.

[http://nhic.mnr.gov.on.ca/natural\\_areas/areas.php?source=MaMNHA&feature=NA&areaid=1850](http://nhic.mnr.gov.on.ca/natural_areas/areas.php?source=MaMNHA&feature=NA&areaid=1850)

## Section 4 : Property Map & Surrounding Area





## Section 5 : Landowner Objectives

### 5.1 General Objectives

Objectives	Priority for Management				
	Low	—————▶			High
	1	2	3	4	5
<b>Environmental Protection &amp; Bio-diversity</b>					x
<b>Recreation</b>					x
<b>Wildlife Habitat &amp; Nature Appreciation</b>					x
<b>Forest Products</b>		x			
<b>Income &amp; Investment</b>		x			

### 5.2 Detailed Property Level Objectives

#### **Environmental Protection/ Biodiversity**

The forest provides several environmental benefits including rainwater capture, carbon storage, soil stabilization, soil fertility enhancement, and habitat for a numerous plants and animals including Species at Risk.

The long-term objective for the Seneca Woodlands is to maintain a healthy and productive forest. This will be accomplished by conserving the existing forest communities and establishing new forests through planting while avoiding management activities that could contribute to soil erosion or groundwater contamination.

Silvicultural management, including thinning, of the conifer plantations is recommended to create canopy gaps and promote regeneration of native species thereby enhancing biodiversity. Conifer plantations can be thinned at 10-15-year intervals. Over time the plantations can be expected to convert to native mixedwood forest communities.

Any silvicultural activities will be carried out according to “good forestry practices” and will comply with the York Region Forest Conservation By-law. Good Forestry Practices as defined in the Provincial Forestry Act means “the proper implementation of harvest, renewal and maintenance activities known to be appropriate for the forest and environmental conditions under which they are being applied and that minimize detriments to forest values including plant ecosystems, important fish and wildlife habitat, soil and water quality and quantity, forest productivity and health and the aesthetics and recreational opportunities of the landscape”. Silvicultural prescriptions will be prepared by a Registered Professional Forester and trees to be removed will be marked by Certified Tree Markers.

Several colonies of invasive plants are found throughout the property including within the forested areas. Invasive plants such as dog-strangling vine, garlic mustard, and buckthorn can quickly occupy

a site , outcompeting native vegetation, and thereby limiting the biodiversity on the site. Controlling these invasive plants where feasible will be an ongoing activity.

Progress towards achieving this long-term objective will be monitored by conducting periodic forest inventories.

### **Wildlife & Nature Appreciation**

The diverse vegetation communities on the property provide a variety of habitats for wildlife including potential habitats for several species at risk and offer opportunities for nature appreciation. Structural habitat features in the forest include large mature trees, trees with roosting and escape cavities, dead standing trees (snags), coarse woody debris on the forest floor and mast producing trees (red oak, American beech, black cherry, ironwood, bitternut hickory). Maintaining diverse assemblage of habitat structures is an important objective. Changes to the forest, areas of tree mortality, pest outbreaks or other issues will be monitored during routine inspections and documented in the plan to help identify opportunities for management.

### **Recreation**

The King Campus contains 27 kilometres of drivable roads and well-marked trails which range from wide, aggregate or woodchipped trails with lookout points, to narrow, winding bike trails and race courses (Map 5). Access to the trails can be gained from several locations within and around the perimeter of the property. A section of the Oak Ridges Trail crosses the northern part of the property. Signage at the public entrances welcome visitors to the property and outline the rules and guidelines for property use. Paid parking is plentiful at Seneca College's many parking lots. Users of the Oak Ridges Trail often park on the shoulders of Dufferin or Keele Streets.

Many of the hiking trails are located within the forested areas and provide opportunities for nature appreciation. Maintaining the forest in a safe condition and maintaining an attractive, functioning trail system with modest amenities are important management priorities.

### **Investment**

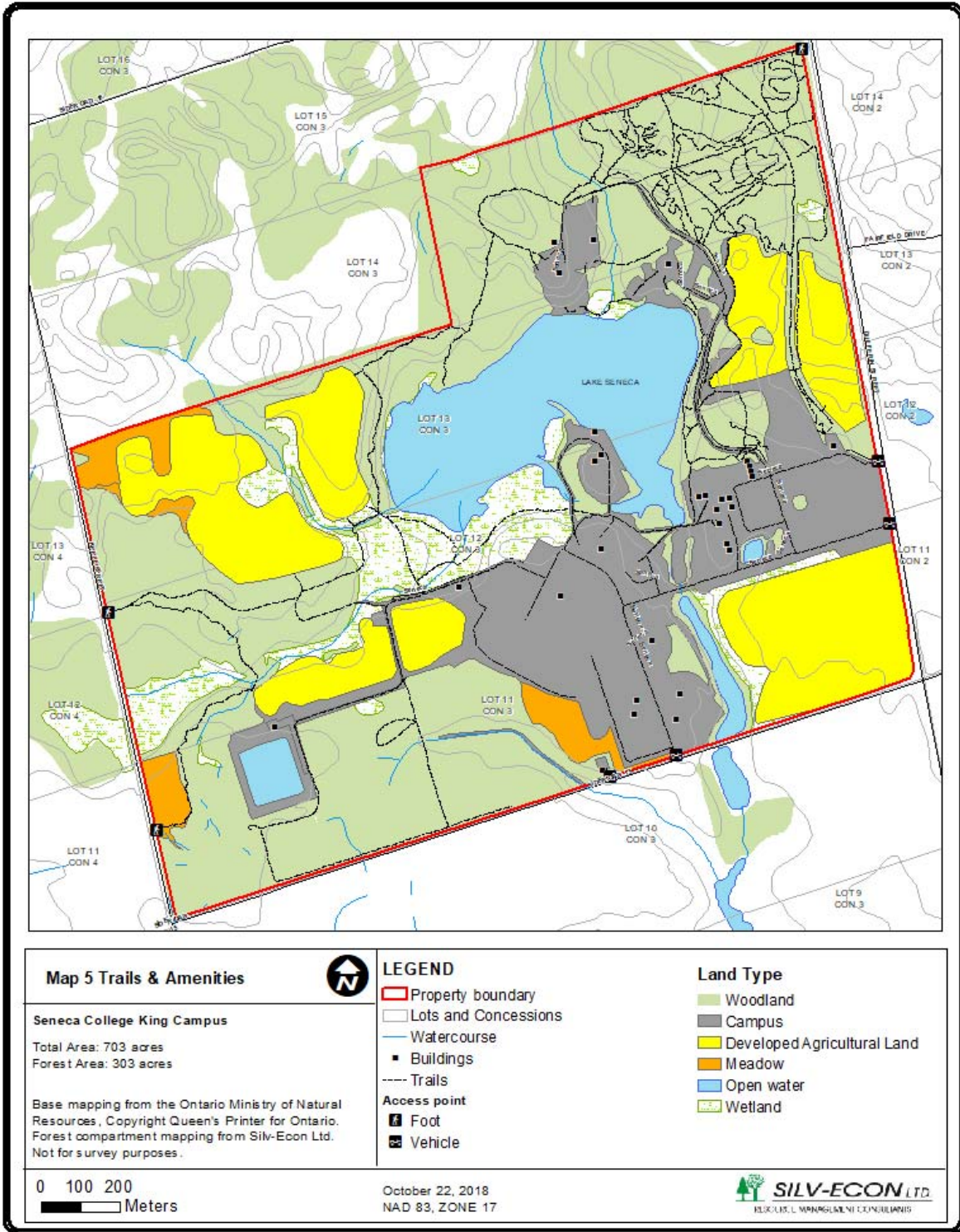
Regular maintenance of the property infrastructure such as fencing, trails, trail amenities such as benches and signage will contribute to the property's investment value. Ensuring the sustainability of forest cover through activities noted in this management plan will help to maintain and add value to the property.

### **Forest Products**

The long-term objective for the woodlands is to achieve an aesthetic, safe, healthy and sustainable forest. Commercial timber management is not a priority. However periodic silvicultural activities such as thinning to promote natural regeneration and species diversity are expected to produce forest products (sawlogs, pulpwood, firewood). Stumpage revenues from the sale of the timber will help offset management expenses.

Proposed future activities scheduled during the operating period 2019-2028 will be implemented and directed by the College with assistance from professionals when required. Contractors may be utilized for tasks which require professional expertise, such as tree marking, tree felling, boardwalk and bridge construction, parking lot construction and maintenance of trails, fencing, gates and benches.

Forests Ontario and the Ontario Woodlot Association are good sources of information on forestry workshops. The Landowner Resource Centre publishes forestry extension notes and other helpful information. Contact information is given in Section 9 of this plan. Activities recommended for the 2019-2028 operating period are outlined in Section 7. These can be reviewed annually as work is completed and evaluated and as new issues or opportunities arise.



## Section 6 : Getting to Know Your Upland and Wetland Areas

### 6.1 Topography, Soils, and Hydrology

The topography and soils on the property are variable and typical of the Oak Ridges Moraine. The northeast section of the property containing the conifer plantations and old-growth forest stands is slightly more elevated than the low-lying areas to the south and west. Soils in the upland area are classed as sandy loams and are generally well drained. The lowland forest has clay soils, impeded drainage, and areas of deep, organic muck - where the cedar thickets thrive.

The King Campus is situated within the Eaton Hall-Mary-Hackett Lakes Wetland Complex. Lake Seneca and other kettle lakes in this complex are prominent features in this part of King Township and are the source of several tributaries to the Humber River.

[http://nhic.mnr.gov.on.ca/natural\\_areas/areas.php?source=MaMNHA&feature=NA&areaid=1850](http://nhic.mnr.gov.on.ca/natural_areas/areas.php?source=MaMNHA&feature=NA&areaid=1850)

### 6.2 Forest Inventory

#### Forest Inventory Techniques

To assist in the development and implementation of a forest management program, the forest was divided into small, manageable areas called compartments. Compartments are land units that are relatively homogeneous in their vegetation composition, age, history and productivity. These land units are shown on Map 6.1. They have a well-defined boundary, which will help with their identification on the ground. Compartments have been assigned a unique identifier and grouped into six distinct forest communities based on their species composition and origin (plantation or natural origin).

Each compartment was assessed in terms of its approximate composition of tree species, tree sizes, average diameter, average age and height, and stem density. This data was collected from within 216 sample plots. The inventory procedure involved the use of a forester's prism (BAF 2). Approximately 2% of the trees in the woodlot were sampled which is sufficient for management planning purposes (OMNR 2004).

#### Trail Mapping

All trails were mapped using a Trimble GEOXT GPS computer (Map 5.1).

#### Inventory of Invasive Plants

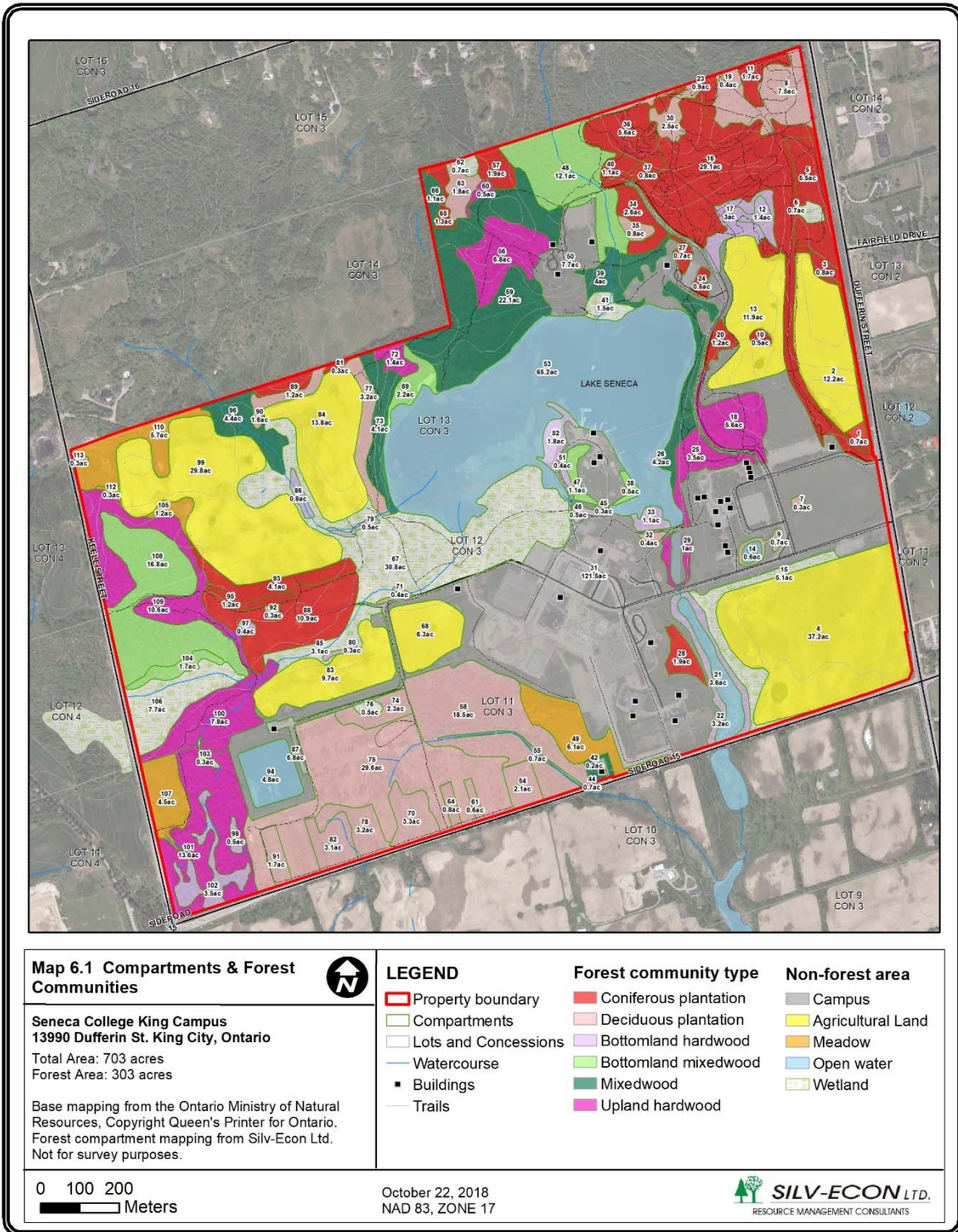
Invasive plants, quantity and extent were recorded while collecting inventory data and while trail mapping. Invasive plants that were noted between inventory plots were mapped as individual points.

### 6.3 Forest Communities

The Seneca Woodlands occupy 122.56 hectares and represent 6 distinct forest communities described in Table 1. There are 80 separate forest compartments (stands) ranging in area from less than 1 ha up to 12 ha (Map 6.1). It is unusual to find a forested area with so many small compartments and reflects the history of the property and its topography, soils, and hydrology. The forest inventory summary is presented in Appendix A.

Table 1. Forest community descriptions and total area.

Forest Community	Total Area (ha)	Community Description
Conifer Plantation	30.12	Conifer plantations of pine and spruce ranging in age from 1 year to approximately 70 years. Many of the older plantations were likely established under previous Provincial forestry programs.
Deciduous Plantation	34.48	Hybrid poplar, willow, and black locust plantations mainly located south west sector of the property to uptake water from the Campus wastewater treatment facility. These plantations are 30-40 years old and some were established to replace earlier deciduous plantations. Approximately 6 ha of red oak dominant plantations were also established in the north east and south west sectors during the 1950's.
Bottomland Hardwoods	6.95	Occupying only 6.95 ha in total area, bottomland hardwoods are willow, ash, or silver maple dominant stands often with a cohort of other deciduous species. Ranging in age from 20 to 100+ years. The oldest are fine examples of old growth silver maple.
Bottomland Mixedwoods	13.97	White cedar stands with a cohort of other species, often including ash. 20 to 80 years old.
Mixedwoods	16.41	These stands contain a variety of conifer and deciduous species. Cedar is often dominant. Situated along the shore of Lake Seneca.
Upland Hardwoods	20.63	Dominated by sugar maple in association with other deciduous species. This forest community contains several examples of old growth upland hardwood forest.
<b>Total Forest</b>	<b>122.56</b>	



## 6.4 Tree Species

The Seneca Woodlands contain approximately 36 tree species and more than 40 species of shrubs and herbaceous plants contributing to a high level of species richness. Some of the more abundant tree species are white cedar, sugar maple, black cherry, white ash, and black willow, and poplar species. Many of the white and black ash in the overstory are in decline from Emerald Ash Borer (EAB). Fortunately, ash is a common species in the understory regeneration. EAB appears to attack trees that have reached 16+ cm DBH so it is likely that ash will continue to be represented in the Seneca Woodlands through its presence in the regeneration. The forest inventory summary in Appendix A includes a list of the tree species identified in the forest inventory.

## 6.5 Shrubs and Herbaceous Plants

Shrubs	Herbaceous Vegetation		
Alternate Leaf Dogwood	Anemone	Horsetail	Queen Anne's Lace
Blue Beech	Aster	Jack In The Pulpit	Raspberry
Buckthorn	Bedstraw	Joe Pye Weed	Rose Twisted Stalk
Chokecherry	Blue Bead Lily	Hog Peanut	Sarsaparilla
Elderberry	Blue Cohosh	Lilac	Sensitive Fern
Highbush Cranberry	Burdock	Lily Of The Valley	Solomon's Seal
Maple-Leaved Viburnum	Cattail	May Apple	Speedwell
	Cucumber Vine	Mayflower	Spinulose Wood Fern
	Currant	Milkweed	Sweet Cicely
	Enchanters Nightshade	Nettle	Trillium
	False Solomon's Seal	Ostrich Fern	Virginia Creeper
	Goldenrod	Periwinkle	Wild Lettuce
	Herb Robert	Purple Loosestrife	White Baneberry

## 6.6 Non-Native Invasive Plants

Non-native invasive plants can quickly occupy a forest site excluding native flora and overtopping small trees and shrubs. Of concern in the Seneca Woodlands are Dog strangling vine (*Vincetoxicum nigrum*), Garlic mustard (*Alliaria petiolata*), Common buckthorn (*Rhamnus cathartica*), Periwinkle (*Vinca minor*), and Japanese knotweed (*Fallopia japonica*).

**Dog-strangling vine** is an extremely aggressive member of the milkweed family that is now established throughout southern Ontario. It is perhaps the most significant biological threat to the forest, since it forms a thick layer, smothering seedlings and strangling saplings, which stops regeneration. It is also a threat to the monarch butterfly because monarchs will lay eggs on it, but monarch caterpillars cannot eat the plant. Small colonies of DSV were observed in the conifer plantations in the north-east sector of the Seneca Woodlands (Map 6.2). DSV can be controlled through repeated applications of glysophate (Roundup). Treatments in the fall (September) appear to be the most effective.



**Garlic mustard** is a biennial herb native to Europe. This species is a serious threat to deciduous forests not just because it forms dense clumps that shade out other plants, but because it secretes chemicals into the soil that prevent their return even after it is removed. It grows in a wide range of habitats and spreads quickly along roadsides and especially recreational trails, its seeds often carried inadvertently by humans, pets and wildlife. It can be removed chemically when found in manageable populations, as in the Seneca Woodlands (Map 6.3).

**Common (European) buckthorn** is an exotic shrub that readily invades natural communities, often aided by birds that disperse their seeds. It has long growing seasons and rapid growth rates, and re-sprouts vigorously following removal of aboveground tissues. Like garlic mustard, buckthorns leave chemicals in the soil that hamper the growth of other plants. Buckthorn is present in many of the forest compartments (Map 6.4). Buckthorn can be treated through basal bark application of triclopyr (Garlon) or glyphosate (Roundup). This treatment is most effective in the fall but can be applied at any time of year except winter.

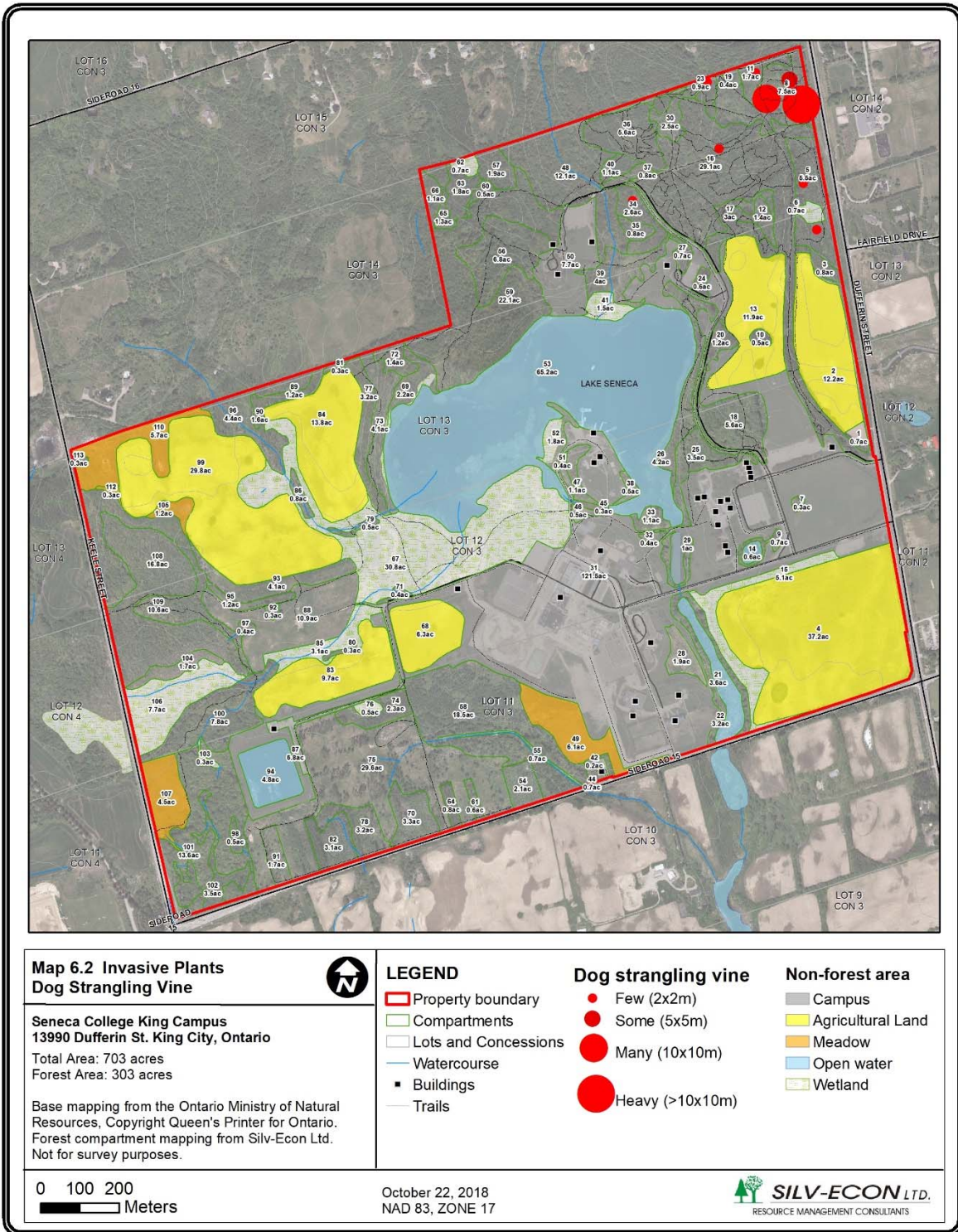
**Periwinkle** was likely planted as an ornamental ground cover on the former Eaton property and has subsequently spread throughout the north east sector of the Seneca Woodlands (Map 6.5). As with other invasive groundcovers it poses a threat to native biodiversity. Periwinkle is readily controlled through application of herbicides.

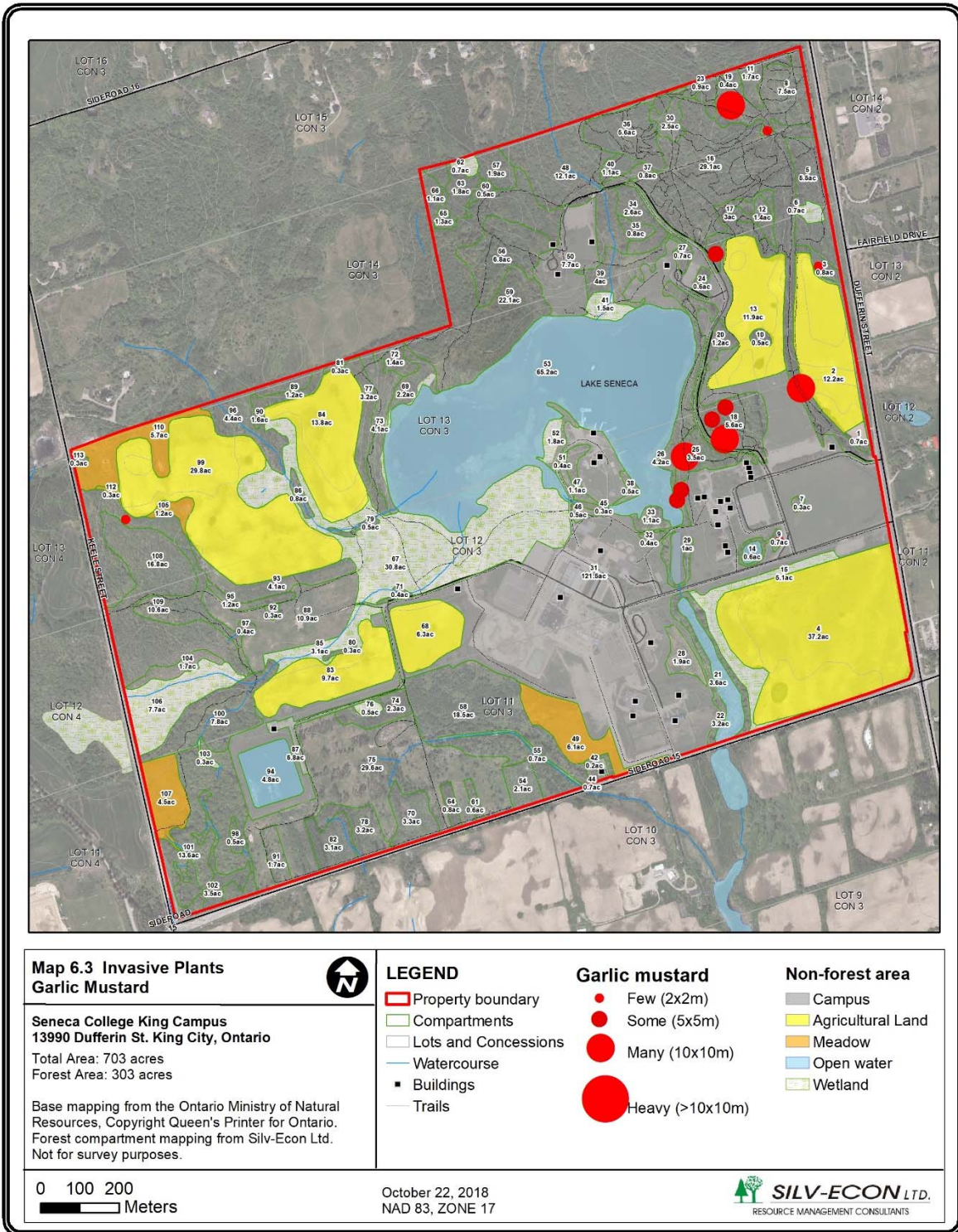


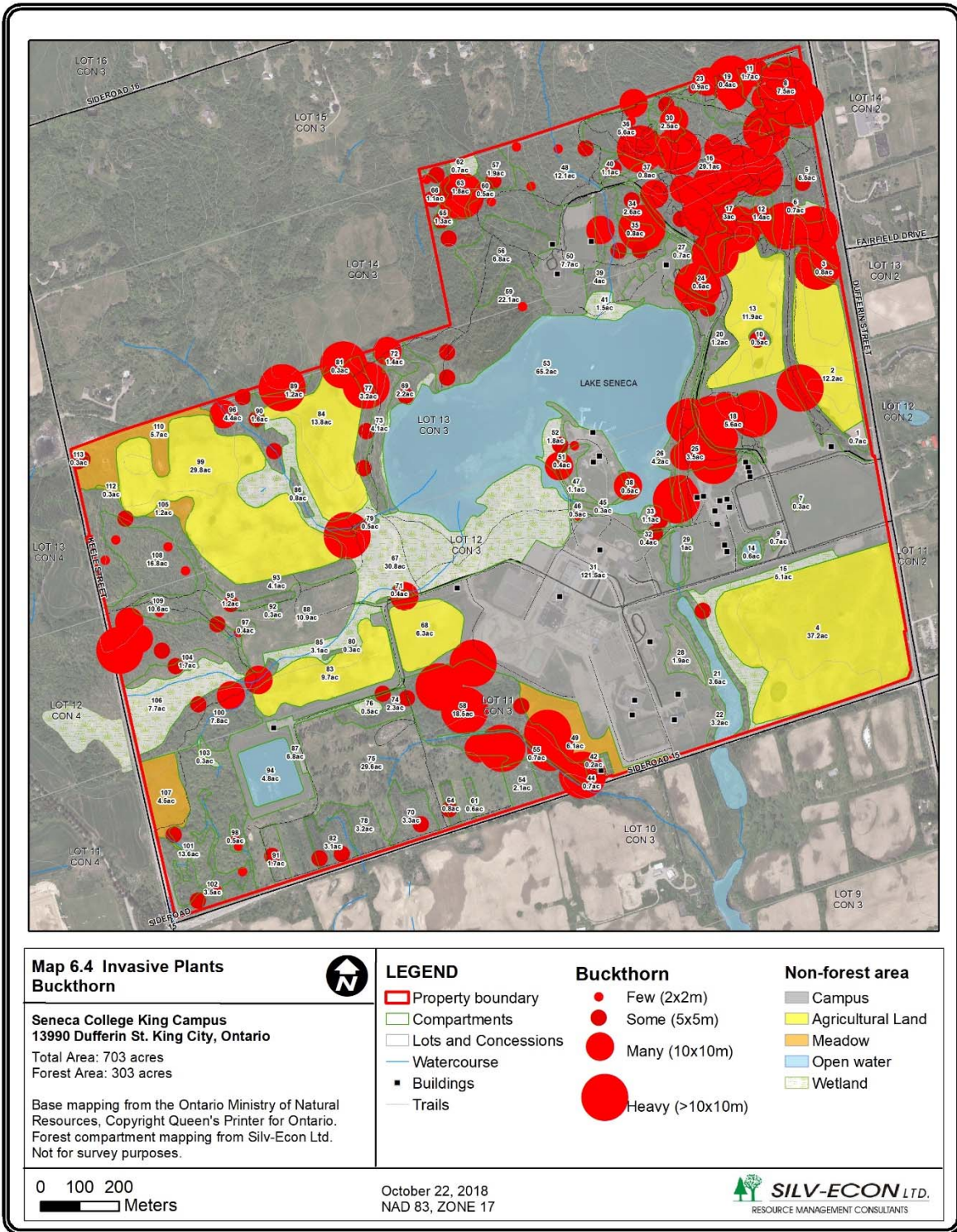
Periwinkle is spreading into upland hardwood compartment 56. >>

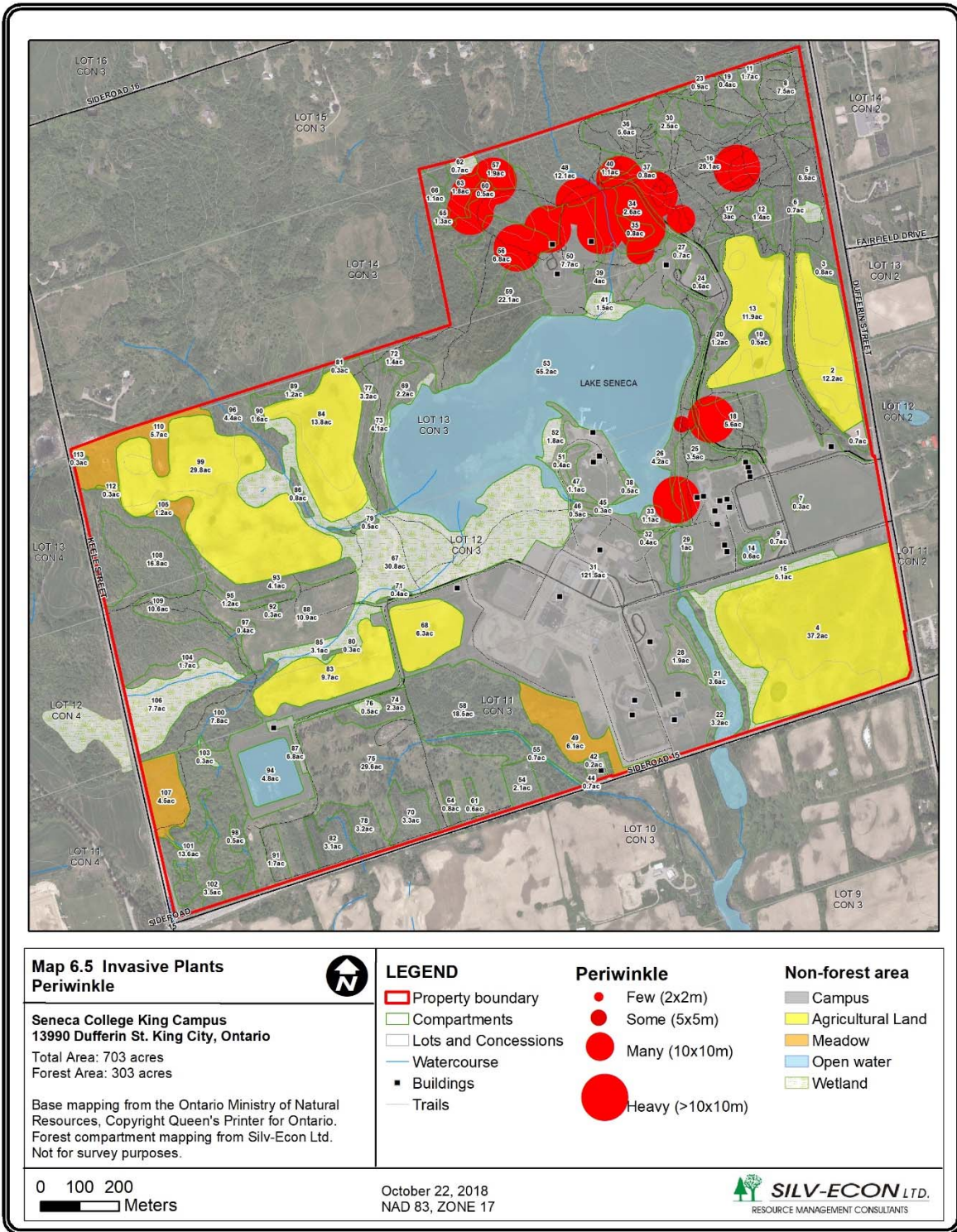
**Japanese knotweed** is an aggressive semi-woody perennial plant that is native to eastern Asia. In the 1800's it was introduced to North America as an ornamental species and planted for erosion control. It has since spread throughout the United States and Canada. Japanese knotweed is often mistaken for bamboo; however, it is easily distinguished by its broad leaves and its ability to survive Ontario winters. Japanese knotweed is especially persistent due to its vigorous root system, which can spread nearly 10 metres from the parent stem and grow through concrete and asphalt. This invader is very persistent and once it becomes established, is incredibly difficult to control. A large colony has established in compartments 92 & 93 between Lake Seneca and Keele Street (Map 6.6)

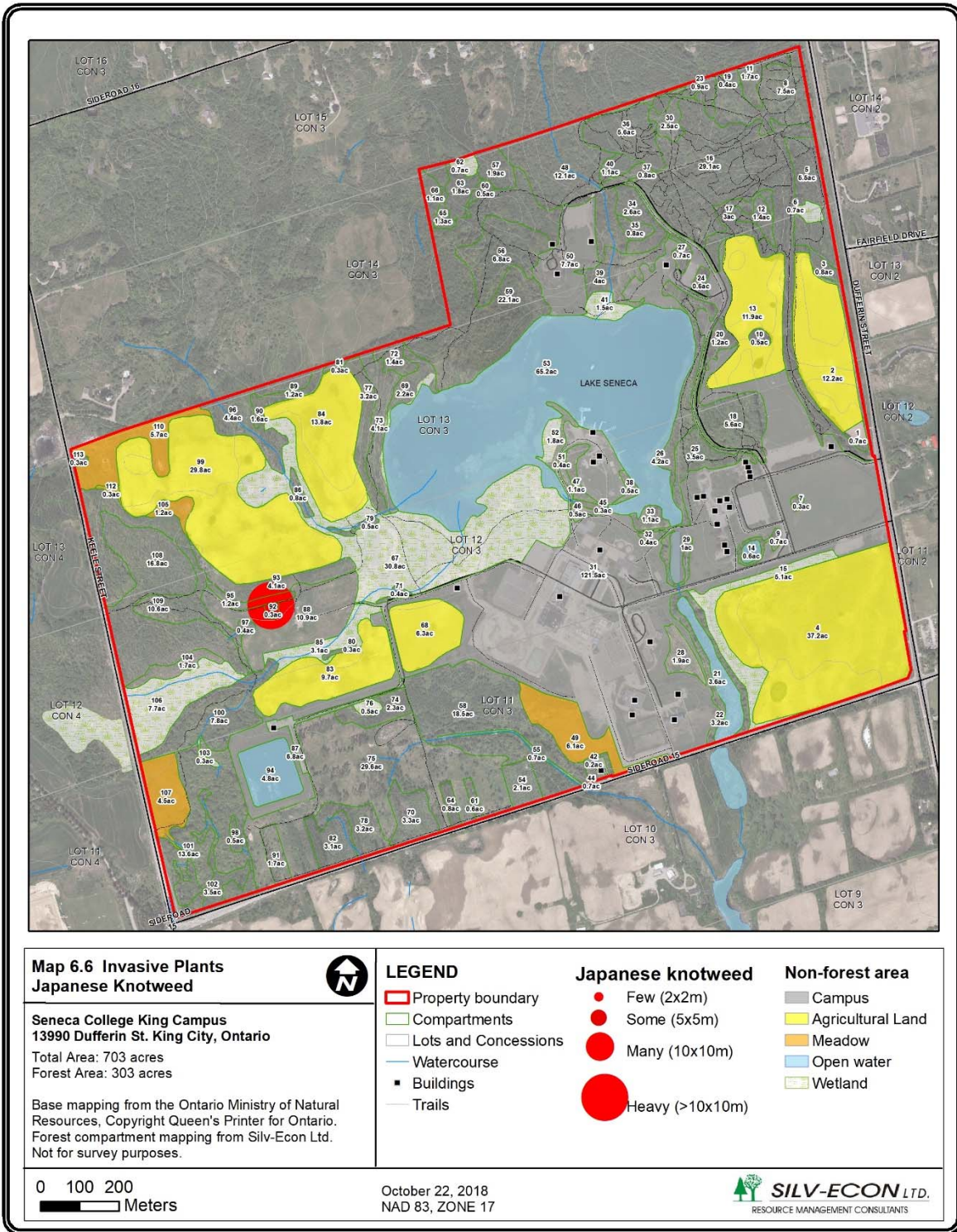
Priority should be given to controlling the dog strangling vine (all locations), periwinkle (all locations), and European buckthorn in areas where it is heavy and where it is growing in isolated patches. Post-treatment planting with native tree species is recommended where suitable conditions exist and where regeneration is lacking. Treatment prescriptions will be prepared providing details of locations, application rates, site protection measures, and recommended post-treatment planting.











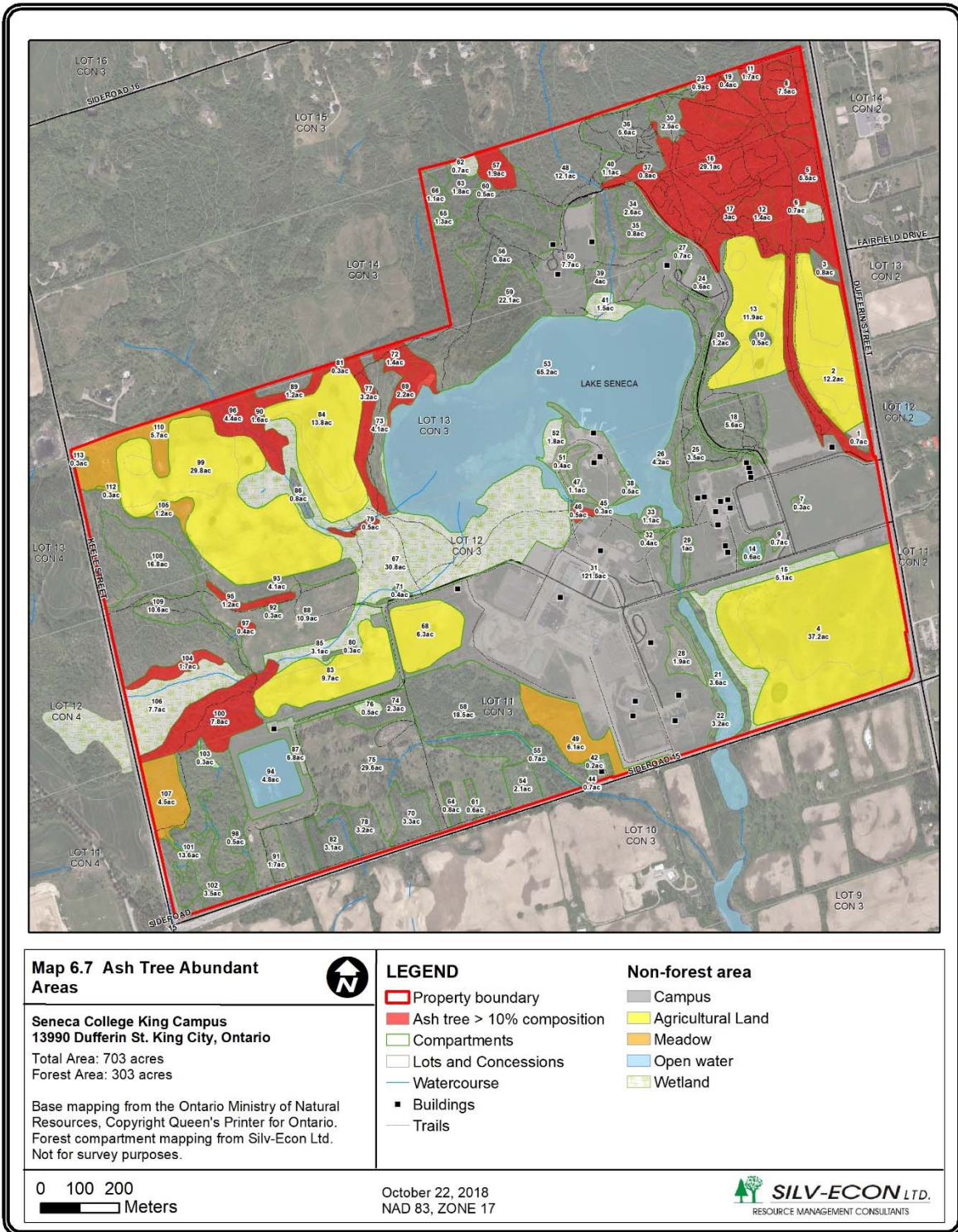
## **6.7 Hazard Trees**

There are several areas within the Seneca Woodlands where ash trees ( $\geq 10$  cm DBH) account for 10% or more of the species composition (Map 6.7). Ash are declining and dying due to attack by Emerald Ash Borer (EAB). These trees have a high likelihood of failure and may impact trail users. The density (stems per hectare) of ash in these areas was used to estimate the number of ash within striking distance (20 metres) of roadways and trails. On this basis approximately 1475 ash trees are within striking distance to the trails in the areas highlighted in red on Map 6.7.

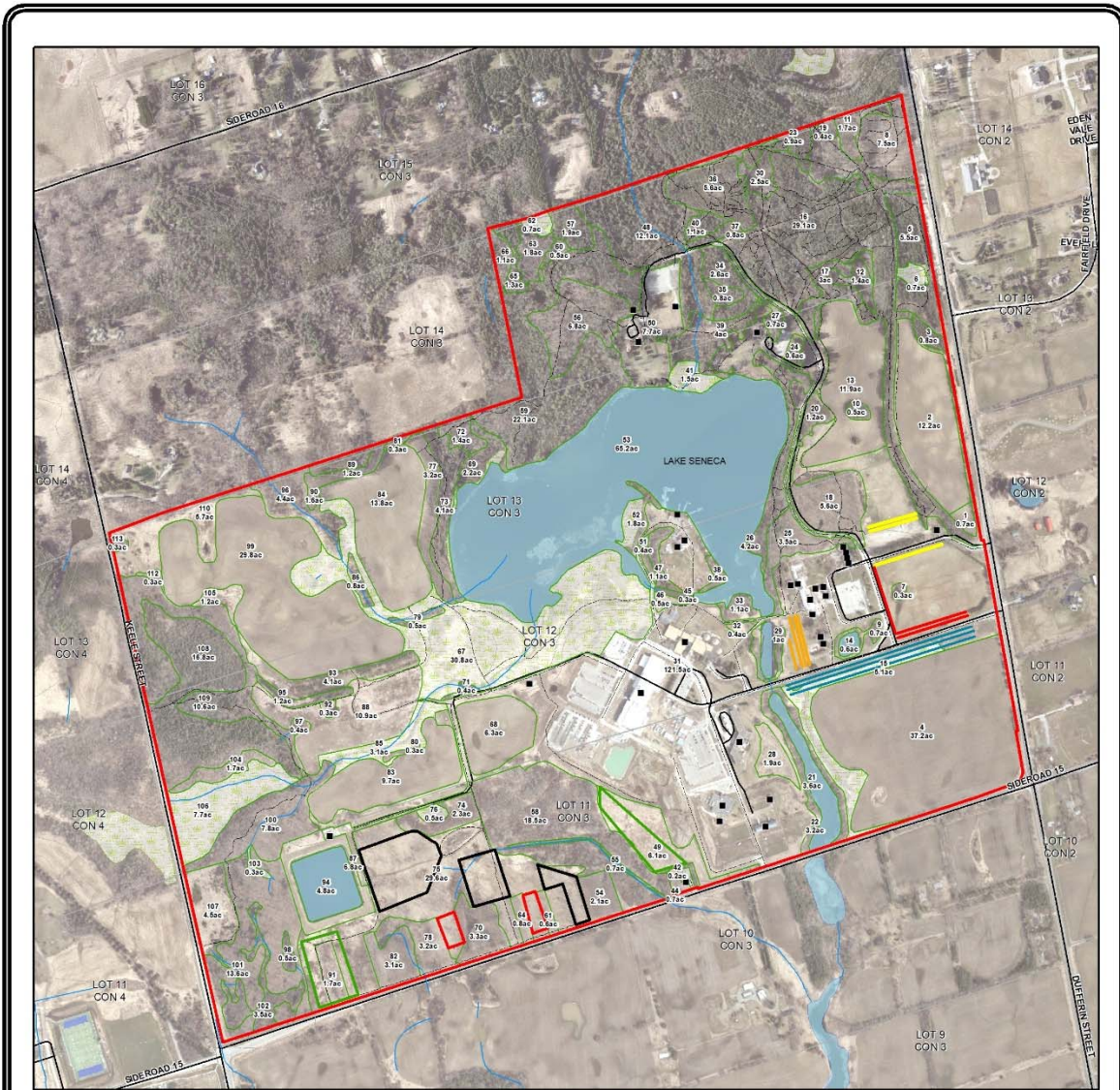
The greatest concentrations of ash trees are in the conifer plantations where the ash could be felled during the proposed commercial thinning operations. If the ash are still sound they could be salvaged for firewood. If so, the removal of the ash would be revenue neutral, i.e. the harvesting contractor would fell and utilize the ash but would not likely pay stumpage on the trees. If the ash cannot be utilized, they could still be felled during the thinning operations. The harvesting contractor would likely discount the stumpage paid on the conifers by some small amount to offset the additional cost of felling the ash. Ash that are outside of the areas that are proposed for commercial thinning would need to be felled by a qualified tree service contractor at a net cost to the College.

## **6.8 Afforestation and Re-Naturalization Areas**

The Seneca Woodlands include young plantations established within the past five years (e.g. compartments 1, 28, 88) through partnerships with the Toronto and Region Conservation Authority (TRCA) or internally by the College. Further planting is scheduled over the next three to five years in areas shown on Map 6.8 pending funding by TRCA. These new plantations will increase the forested area on the property by approximately 7 hectares.







**Map 6.8 Afforestation and Re-naturalization 2019-2023**



**Seneca College King Campus**  
13990 Dufferin St. King City, Ontario

Total Area: 703 acres  
Forest Area: 303 acres

Base mapping from the Ontario Ministry of Natural Resources, Copyright Queen's Printer for Ontario. Forest compartment mapping from Silv-Econ Ltd. Not for survey purposes.

**LEGEND**

- Property boundary
- Compartments
- Lots and Concessions
- Buildings
- Trails
- Watercourse
- Open water
- Wetland
- Proposed internal planting
- Conifer snowbreak test area (2019-2020)
- Fruit trees (on-going)
- Mix of transplanted shade trees (2019-2020)
- Mixed planting barrier (2020-2021)
- Proposed TRCA planting (2019-2021)
- Mixed planting
- Hybrid poplar
- Species to be determined

0 100 200  
Meters

January 7, 2019  
NAD 83, ZONE 17

**SILV-ECON LTD.**  
RESOURCE MANAGEMENT CONSULTANTS

## 6.9 Wildlife Habitat Inventory and Natural Heritage Assessment

<b>6.9 (a) Wildlife Habitat Inventory</b>	
<b>Habitat Feature</b>	<b>Notes &amp; Comments</b>
<b>Standing Dead Snags</b> <ul style="list-style-type: none"> <li>• <i>Can provide habitat for many species</i></li> <li>• <i>Can be a safety hazard during logging operations</i></li> </ul>	Abundant throughout the forest.
<b>Cavity Trees</b> <ul style="list-style-type: none"> <li>• <i>A standing tree, dead or alive, that has a hole or holes where wildlife can make nests or dens or escape predators</i></li> </ul>	Observed in all forest communities. Most abundant in upland and bottomland hardwood stands.
<b>Stick Nests</b> <ul style="list-style-type: none"> <li>• <i>Nest made of sticks located in a tree</i></li> </ul>	None observed within the forest.
<b>Fallen Dead Trees</b> <ul style="list-style-type: none"> <li>• <i>Logs on the forest floor used by wildlife for foraging and escape</i></li> </ul>	Found throughout the forest.
<b>Mast Trees</b> <ul style="list-style-type: none"> <li>• <i>The fruit and seeds produced by trees and shrubs</i></li> <li>• <i>An important source of food for wildlife</i></li> <li>• <i>Soft mast are fleshy fruit such as berries</i></li> <li>• <i>Hard mast are shelled nuts such as acorns</i></li> </ul>	American beech, red oak, black cherry, ironwood, bitternut hickory. Found throughout the forest but most abundant in the upland hardwood stands.
<b>Super-canopy Trees</b> <ul style="list-style-type: none"> <li>• <i>A cluster of vegetation composed of tall trees that poke through the canopy</i></li> <li>• <i>Usually conifers, such as white or red pines</i></li> <li>• <i>Provides landmarks and nesting spots for birds more cuts</i></li> </ul>	No individual super canopy trees were identified. However, several stands contain trees that exceed 25 metres in height.
<b>Conifer Thickets</b> <ul style="list-style-type: none"> <li>• <i>A cluster of conifer trees that provide shade, reduced snow depth and thermal shelter for wildlife</i></li> </ul>	Many of the bottomland conifer stands have dense cedar canopies.
<b>Other Food Sources</b> <ul style="list-style-type: none"> <li>• <i>Berries, cones etc that serve as forage for wildlife</i></li> </ul>	Spruce and red pine cones, raspberries, currants.
<b>Surface Water</b> <ul style="list-style-type: none"> <li>• <i>Sources of drinking water for wildlife</i></li> </ul>	Lake Seneca and associated watercourses.
<b>Dens or Dug Holes</b> <ul style="list-style-type: none"> <li>• <i>Ground holes used for denning or escape</i></li> </ul>	Abundant throughout the forest.

## 6.9 (b) Wildlife Species Noted or Likely Present

Herpetofauna	Mammals	Birds
Spring peepers Wood frog Salamander	White-tail deer Raccoon Eastern chipmunk Gray squirrel Red fox Coyote Bats Red squirrel Gray squirrel Eastern chipmunk	Red tail hawk Pileated woodpecker Hairy woodpecker Downy woodpecker Flicker Black-capped chickadee Blue jay Common crow Ruby throated hummingbird Robin American goldfinch Cardinal White breasted nuthatch Wild turkey

## 6.10 Species at Risk

A data scan of the Natural Heritage Information Centre (NHIC) database noted one Species At Risk (SAR) within 1km<sup>2</sup> radius of property over the last twenty years. The Eastern Wood-pewee (*Contopus virens*) [Special Concern] lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation. Although not currently threatened or endangered it could become so due to loss of habitat associated with land development in the area. Species At Risk are protected under Ontario's Endangered Species Act.

Butternut was observed in compartments 18, 22, 25, and 26. Butternut is in decline across its natural range due to butternut canker which is infecting and killing these important mast trees. As a result, Butternut is classed as Endangered and is protected under Ontario's Endangered Species Act. Planting locally adapted butternut seed or seedlings in forest gaps or open areas has been recommended in Ontario's Butternut Recovery Strategy. Butternut grows best on deep, fresh limestone-based soils. Soils on the Seneca College campus are not well suited to butternut and planting butternut is not recommended.

The diverse vegetation communities on the property may also provide suitable habitats for several other Species at Risk including Cerulean Warbler (*Setophaga cerulea*), Hooded Warbler (*Wilsonia citrina*), American ginseng (*Panax quinquefolius*), Broad beech fern (*Phegopteris hexagonoptera*), and Milksnake (*Lampropeltis triangulum*).

For more information on species at risk in Ontario visit:

<http://www.mnr.gov.on.ca/en/Business/Species/index.html>

## Section 7 : Objectives and Recommended Activities 2019-2028

Forest-level management objectives and activities are specified by forest type with reference to specific compartments as needed. A forest-level approach to management is broadly based, treats the forest as a landscape unit, and avoids the tendency to fragment the forest that is often associated with stand – or compartment-level management approaches. The forest type of a compartment is determined according to (i) the most common species (by basal area) in the compartment, and (ii) the species composition of the compartment. Six forest types are associated with the Seneca Woodlands as described in Table 2.

Long and short-term management objectives are developed for each vegetation type to guide future activities. The long-term objectives serve as the landowner’s vision for each vegetation type for the next 20 years. The short-term objectives serve to guide activities to implement over the next 10 years.

### 7.1 Long-Term Objectives (20 years)

The Seneca Woodlands will be managed for multiple objectives as outlined in Section 5.2. Management will be directed by the following key objectives,

- Environmental Protection & Biodiversity - implementing activities that enhance forest health and promote natural regeneration
- Wildlife Habitat & Nature Appreciation - retaining and conserving wildlife habitat features
- Recreation – providing opportunities to experience nature and learning more about the forests and wildlife on the property
- Investment – maintaining forest resource values and property infrastructure
- Forest products – produce forest products through sustainable silvicultural management

### 7.2 Short-Term Objectives and Recommended Activities 2019-2028

The following objectives and activities are proposed for the managed forest during the 10-year period 2019-2028. Section 7.3 provides a list of prioritized proposed activities. Accomplishments and notes will be recorded and appended to this plan.

#### Conifer Plantations

Area 30.12 ha

1. Approximately 21 ha of conifer plantations would benefit from a stand improvement thinning to create canopy gaps and promote natural regeneration. These compartment numbers are highlighted in red in the forest inventory summary Appendix A. Any thinning must comply with the York Region Forest Conservation By-law. Silvicultural prescriptions will be prepared by a Registered Professional Forester. Trees to be removed will be marked by Ontario Certified Tree Markers. The thinning operations will be monitored by a Registered Professional Forester. A

post-thinning forest inventory will be completed for the stands that are thinned. Appendix B provides an example of a silvicultural prescription.

2. Consider treating invasive plants in the plantations one or more years prior to thinning. This will reduce the likelihood that the invasive plants will thrive in the stands after the thinning. Multiple treatments with herbicide in consecutive years will likely be required for controlling dog-strangling vine and buckthorn.
3. Follow Provincial guidelines for protecting any stick nests during silvicultural operations.
4. Retain structural habitat features (large logs on the forest floor, standing dead trees (where they do not pose a safety hazard), and cavity trees).

### **Deciduous Plantations**

Area 34.48 ha

1. The deciduous plantations were established to uptake water from the Campus wastewater treatment facility. Their health will be monitored through periodic inspections and inventory updates. Plantations that are in decline will be cleared and reforested. Any clearing must comply with the York Region Forest Conservation By-law. The cleared trees can be processed for biomass fuel.

### **Bottomland Hardwoods/Bottomland Mixedwoods/Mixedwoods**

Areas 6.95/13.97/16.41 ha

1. Monitor for invasive plants and insects.
2. Control invasive plants where feasible. Many of these stands are situated along the shores of Lake Seneca or are seasonally wet and herbicide treatments are not recommended.
3. Silvicultural management of these forest communities is not recommended at this time. Hazard tree removal may be necessary adjacent to trails. Cut felled trees into shorter lengths and leave on the forest floor as coarse woody debris. Bottomland sites are seasonally wet and could be impacted by harvesting equipment.

### **Upland Hardwoods**

Area 20.63 ha

1. Monitor for invasive plants and insects.
2. Control invasive plants where feasible.
3. Silvicultural management in the upland hardwood stands is not recommended at this time. Hazard tree removal may be necessary adjacent to trails. Cut felled trees into shorter lengths and leave on the forest floor as coarse woody debris.

## **New Plantations**

Area approximately 7 ha

Approximately 7 ha of new plantations are planned over the next five years (2019-2023) as shown on Map 6.8.

1. Monitor plantation survival in years 1, 3, and 5 post-planting. Infill where necessary.
2. Monitor for invasive plants and insects.
3. Control invasive plants where feasible.

## **All Compartments**

1. Consider planting canopy gaps with species not currently present to promote adaptation of the forest to climate change. Potential species include sassafras, tulip tree, white oak, bur oak, and shagbark and bitternut hickory. Annual inspections of the forest will help to locate areas for planting.
2. Continue to promote safety of the trail system by:
  - I. Inspecting the trails annually and more frequently if necessary, e.g. following significant storms.
  - II. Marking and felling dead or declining trees that are within striking distance of all trails. Larger logs can be left on site as woody debris. Smaller logs and branches can be chipped and used as trail bedding to protect the trails from erosion.
  - III. Trimming vegetation encroaching into trails and removing suspended or fallen trees or branches.
3. Install new fencing and/or yellow dot boundary markers along the north perimeter of the Seneca Woodlands to establish visual limits of the property's perimeter. The page wire fence is down in some areas, and boundary markings will be useful for the implementation of other management activities that require knowledge of where property boundaries are located.
4. Inspect and maintain trail infrastructure (benches, boardwalks, bridges) as needed.
5. Maintain trail maps and educational boards throughout the Seneca Woodlands. The signs are visible and well placed, easy to read, and accurately display active trails. Additional educational boards can be installed to further explain the flora, fauna, history, and management activities.
7. Maintain entrance signs along the Oak Ridges Trail, and within the Seneca Woodlands. Examples of signs/ display cases noting forest rules, trail maps, and emergency contact information can be found on other public properties within York Region.
8. Install automated wildlife camera(s) to learn more about the wildlife that use the forest, wetlands, and ponds. Monitor wildlife activity and document observations in Section 8 of this management plan.
9. Create brush piles adjacent to trails to provide habitat for small mammals.
10. Limit the creation of additional trails by encouraging forest users to stay on the trails in environmentally sensitive areas, and to not 'cut through' areas with dense trail systems.

11. Maintain ‘untouched’ pockets of forest where all human activity is limited. These areas may be secluded from trails, or environmentally sensitive areas (e.g. marshlands west of Lake Seneca, secluded areas in the southwest and northwest sections of the Seneca Woodlands).
12. Complete an annual work summary to append to Section 8 of this plan.

### 7.3 Proposed Activities and Priority of Implementation

Proposed Activity	Description	Priority for Implementation H – within 1-2 years M – within 5 years L – as funds permit A- annually
Hazard tree management	Remove hazard trees within striking distance of roads/trails. Monitor annually and remove new hazard trees.	H/A
Invasive species management	Implement actions to control invasive species <ul style="list-style-type: none"> <li>• Dog strangling vine</li> <li>• Periwinkle</li> <li>• Garlic mustard</li> <li>• Japanese knotweed</li> <li>• Buckthorn</li> </ul>	H H M M M - H (heavy concentrations)
Silvicultural management	Implement a stand improvement thinning in the conifer plantations	M
Afforestation/ Re-naturalization	Increase forest cover through tree planting in fields and meadows.	M
Species diversity	Enhance species diversity by planting underrepresented species. Monitor survival and growth at 1-year and 5-year post-planting.	M
Visitor experience	Trail maps, signage, infrastructure	Ongoing (L)

**Section 8 : Report of Activities**

<b>Comp</b>	<b>Year</b>	<b>Activity</b>	<b>Quantifiable Measure</b>	<b>Comments</b>
All	September 2018 – January 2019	Forest inventory completed Managed Forest Plan 2019-2038 prepared	122.56 ha Managed Forest area	Plan prepared by David Puttock, R.P.F., Silv-Econ Ltd., Newmarket, ON L3Y 6J1 905-898-3085



## Section 9 : Where To go For Assistance

David Puttock, R.P.F., Silv-Econ Ltd., 913 Southwind Ct., Newmarket, ON L3Y 6J1  
phone: (905) 898-3085; fax: (905) 898-2722; email: [silvecon@rogers.com](mailto:silvecon@rogers.com);  
website: <http://www.silvecon.com>

### **Native Tree and Shrubs**

Somerville Nurseries  
P.O. Box 70, Alliston, Ontario. L9R 1T9  
(705) 435-6258, fax (705) 435-4230

### **Landowner Support & Publications**

#### **Forests Ontario**

144 Front Street West, Suite 700  
Toronto, ON M5J 2L7  
Toll Free: 1-877-646-1193  
Local: 416-646-1193  
Fax: 416-493-4608  
Website: [www.forestsontario.ca](http://www.forestsontario.ca)

#### **Ontario Woodlot Association**

RR # 4, 275 County Road 44  
Kemptville, ON K0G 1J0  
888-791-1103  
[www.ont-woodlot-assoc.org](http://www.ont-woodlot-assoc.org)

#### **Landowner Resource Centre**

Box 599, 5524 Dickinson Street  
Manotick, ON K4M 1A5  
613-692-2390  
[www.lrconline.com](http://www.lrconline.com)

## Section 10 : References

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## APPENDIX A

### Tree Species Abbreviations

Abbreviation	Common Name	Scientific Name	Abbreviation	Common Name	Scientific Name
Ab	black ash	<i>Fraxinus nigra</i> Marsh.	La	European larch	<i>Larix decidua</i> Mill.
Ald	speckled alder	<i>Alnus rugosa</i>	Lb	black locust	<i>Robinia pseudoacacia</i>
Ag	red / green ash	<i>Fraxinus pennsylvanica</i> Marsh.	Lh	honey locust	<i>gleditsia triacanthos</i> L.
Ap	apple	<i>Malus sp.</i>	Mh	sugar maple	<i>Acer saccharum</i> Marsh.
Aw	white ash	<i>Fraxinus americana</i> L.	Mm	Manitoba maple	<i>Acer negundo</i>
Bb	blue beech	<i>Carpinus caroliniana</i>	Mn	Norway maple	<i>Acer platanoides</i> L.
Bd	basswood	<i>Tilia americana</i> L.	Mr	red maple	<i>Acer rubrum</i> L.
Be	beech	<i>Fagus grandifolia</i> Ehrh.	Ms	silver maple	<i>Acer saccharinum</i> L.
Bf	balsam fir	<i>Abies balsamea</i> (L.) Mill.	Mta	mountain ash	<i>Sorbus spp.</i> Marsh.
Bn	butternut	<i>Juglans cinerea</i> L.	Or	red oak	<i>Quercus rubra</i> L.
Bt	European buckthorn	<i>Rhamnus cathartica</i>	Ow	white oak	<i>Quercus alba</i> L.
Bw	white birch	<i>Betula papyrifera</i> Marsh.	Pg	largetooth aspen	<i>Populus grandidentata</i> Michx.
By	yellow birch	<i>Betula alleghaniensis</i> Arnold	Pj	jack pine	<i>Pinus banksiana</i> Lamb.
Cb	black cherry	<i>Prunus serotina</i> Ehrh.	Po	poplar	<i>Populus</i> L.
Ce	eastern white cedar	<i>Thuja occidentalis</i> L.	Pr	red pine	<i>Pinus resinosa</i> Ait.
Ch	choke cherry	<i>Prunus virginiana</i> L.	Ps	Scots pine	<i>Pinus sylvestris</i> L.
Cp	pin cherry	<i>Prunus pensylvanica</i> L.f.	Pw	white pine	<i>Pinus strobus</i> L.
El	white elm	<i>Ulmus americana</i> L.	Sn	Norway spruce	<i>Picea abies</i> (L.) Karst.
He	eastern hemlock	<i>Tsuga canadensis</i> (L.) Carr.	Sw	white spruce	<i>Picea glauca</i> (Moench) Voss
Hi	bitternut hickory	<i>Carya cordiformis</i> (Wang.) K. Koch	Wi	willow	<i>Salix</i> L.
Iw	ironwood	<i>Ostrya virginiana</i> (Mill.) K. Koch	Wn	black walnut	<i>Juglans nigra</i> L.

## APPENDIX B

### Forest Inventory Summary

Compartments highlighted in red are recommended for thinning during the 2019-2028 operating period.

COMP	AREA (HA)	FOREST COMMUNITY	SPECIES COMPOSITION (TREES > 9 CM DBH)	DBH (CM) (TREES > 9 CM DBH)	AGE	HT (m)	DENSITY (STEMS/HA > 9CM DBH)	BASAL AREA M2/HA > 9 CM DBH)	ADVANCED REGEN COMPOSITION	ADVANCED REGEN DENSITY (STEMS/HA)
1	0.28	Coniferous plantation	None present	10	1	1	0	0.0	none	0
3	0.32	Coniferous plantation	Sw10 ( Ps )	18	65	23	1801	48.0	Bt10	1000
5	2.21	Coniferous plantation	Sw7 Aw1 Pr1 Ps1 ( Sn )	23	45	21	945	38.7	Aw5 Sw5	667
7	0.11	Deciduous plantation	Po5 Wi5	77	40	17	9	4.0	none	0
8	3.02	Deciduous plantation	Mh3 Or3 Wn3 Aw1 ( El Cb Ms Pw )	28	65	23	391	23.7	Aw5 Bt4 Wn1	1833
9	0.29	Deciduous plantation	Ald4 Wn4 Pt2	15	25	12	575	10.0	none	0
10	0.20	Coniferous plantation	Sw9 Po1 ( El )	17	50	21	2130	48.0	none	0
11	0.70	Coniferous plantation	Pr8 Aw1 Mh1	21	70	20	1008	34.0	Aw5 Bt5	1000
12	0.55	Bottomland hardwood	Aw10	18	40	18	152	4.0	Aw10	3000
16	11.77	Coniferous plantation	Pw3 Pr2 Aw1 Or1 Sn1 Sw1 ( Ab Cb Ce Hi La Mh Po Ps Wn )1	26	68	23	733	37.8	Aw6 Po2 Bt2	1545
17	1.20	Bottomland hardwood	Aw3 Ms3 Po2 Cb1 Pw1 ( Bt Ch )	23	110	24	909	38.0	Bt6 Aw2 Cb2	4000
18	2.27	Upland hardwood	Mh7 Be1 Or1 Wi1 ( Aw Bd Bn He Pw Sw )	28	83	22	426	25.7	Aw4 Cb3 Mh3	500

COMP	AREA (HA)	FOREST COMMUNITY	SPECIES COMPOSITION (TREES > 9 CM DBH)	DBH (CM) (TREES > 9 CM DBH)	AGE	HT (m)	DENSITY (STEMS/HA > 9CM DBH)	BASAL AREA M2/HA > 9 CM DBH)	ADVANCED REGEN COMPOSITION	ADVANCED REGEN DENSITY (STEMS/HA)
19	0.16	Deciduous plantation	Lb8 Cb1 La1	25	70	22	453	22.0	Bt10	2000
20	0.49	Coniferous plantation	Pr10	23	50	19	615	26.0	lilac5 Aw5	6000
22	1.30	Bottomland hardwood	Wi4 Ap2 Bn1 Ce1 ( El Wn )2	18	44	15	345	8.4	Po10	600
23	0.37	Coniferous plantation	Pr8 Aw1 Mh1	21	70	20	1008	34.0	Bt5 Aw5	1000
24	0.24	Coniferous plantation	Ps5 Sn5	30	75	20	717	50.0	Bt10	4000
25	1.41	Upland hardwood	Mh7 Be1 Or1 Wi1 ( Aw Bd Bn He Pw Sw )	28	83	22	426	25.7	Aw4Cb3 Mh3	500
26	1.71	Mixedwood	Cb3 Sn2 Ce1 He1 Mh1 Or1 Wi1 ( Be Bn Bw Po )	19	85	22	854	23.0	Cb7 Pw1 Bt1 Be1	2000
27	0.30	Coniferous plantation	Sw5 Sn3 Bt1 ( Cb )1	22	75	26	1176	44.0	none	0
28	0.76	Coniferous plantation	None present	10	5	1	0	0.0	Mh5 Pw1 Bd1 Bw1 La1 Hac1	1400
29	0.41	Upland hardwood	Cb5 Mta2 Wn2	33	40	16	93	8.0	Cb10	2000
30	1.02	Deciduous plantation	Or6 Mh2 Cb1 Pr1 ( Aw La Sw )	24	65	23	775	34.0	Mh5 Bt5	667
32	0.14	Deciduous plantation	Lb5 Ms5	20	20	9	262	8.0	none	0
33	0.43	Bottomland hardwood	Wi7 Ce2 Po1	27	30	14	178	10.0	Bt10	500
34	1.04	Coniferous plantation	Pr3 Ps3 Sw2 Cb1 ( Aw Ce He Mh Mr Or )1	20	75	22	1434	46.0	Bt5 Mr5	1000
35	0.34	Deciduous plantation	Lb5 Bt3 Ps2 ( Cb )	18	80	23	1772	44.0	Bt10	1000

COMP	AREA (HA)	FOREST COMMUNITY	SPECIES COMPOSITION (TREES > 9 CM DBH)	DBH (CM) (TREES > 9 CM DBH)	AGE	HT (m)	DENSITY (STEMS/HA > 9CM DBH)	BASAL AREA M2/HA > 9 CM DBH)	ADVANCED REGEN COMPOSITION	ADVANCED REGEN DENSITY (STEMS/HA)
36	2.28	Coniferous plantation	Pr7 Bw1 Mh1 Pw1 ( Aw Cb Ms Or )	21	75	22	1050	38.0	Aw5 Cb2 Wn2 Bt1	2000
37	0.33	Coniferous plantation	Ce5 Ps2 Aw1 Cb1 Or1	16	75	25	1538	32.0	Ce10	1000
38	0.22	Bottomland mixedwood	Ce9 Bw1	14	30	9	2165	32.0	Bt10	5000
39	1.61	Mixedwood	Ce7 Bw2 Pw1	14	35	18	551	9.0	Aw4 Ce3 El3	1500
40	0.43	Coniferous plantation	Pw9 ( Cb El Mh )1	28	75	26	719	44.0	none	0
44	0.29	Mixedwood	Mm4 Ce2 Lh2 Pr1	41	30	16	137	18.0	none	0
46	0.20	Bottomland hardwood	Aw10	12	20	7	531	6.0	Ce10	1000
47	0.46	Bottomland mixedwood	Ce8 Bw2	14	20	7	808	12.0	Ce10	2000
48	4.90	Bottomland mixedwood	Ce4 He2 Bw1 ( Aw Bd Bt By Cb Mh Po Pw Sn Wi )3	23	76	20	858	36.7	Ce2 OH2 Mm2 Aw2 Cb2 ( Mh Bt Bd )	2111
51	0.17	Bottomland hardwood	Wi10	24	30	12	90	4.0	Po7 Ce3	3000
52	0.72	Bottomland hardwood	Wi10	62	30	18	13	4.0	none	0
54	0.85	Deciduous plantation	Wi10	15	30	18	1684	30.0	none	0
56	2.77	Upland hardwood	Mh7 Be1 ( Aw Cb He Or )2	27	100	24	486	28.0	Be5 Mh3 Aw2	1333
57	0.78	Coniferous plantation	Ps4 Aw1 Be1 Bw1 Cb1 He1 Or1 ( Sw )	17	65	25	1300	30.0	He10	1000
58	7.47	Deciduous plantation	Po7 Bt1 Wi1 ( Bd Bw Ce El Mr )1	17	39	19	782	17.3	Bt7 Po2 Ald1 (Wi )	2556

COMP	AREA (HA)	FOREST COMMUNITY	SPECIES COMPOSITION (TREES > 9 CM DBH)	DBH (CM) (TREES > 9 CM DBH)	AGE	HT (m)	DENSITY (STEMS/HA > 9CM DBH)	BASAL AREA M2/HA > 9 CM DBH)	ADVANCED REGEN COMPOSITION	ADVANCED REGEN DENSITY (STEMS/HA)
59	8.92	Mixedwood	He3 Ce2 Mh2 Bw1 Or1 ( Aw Bd Be By Cb La Pw Sw Wi )1	24	95	22	833	38.3	Mh3 Aw2 OH1 Ce1 lw1 Be1 He1 ( By )	1833
60	0.22	Upland hardwood	Mh4 Lb3 He2 Bw1 ( Wi )	39	100	24	233	28.0	Mh10	1000
61	0.24	Deciduous plantation	Po10	19	30	21	637	18.0	none	0
63	0.74	Deciduous plantation	Lb5 Po2 Bt1 Cb1 Pw1 ( Sw )	18	65	24	1394	37.0	Po10	3000
64	0.33	Deciduous plantation	Po10	43	30	23	273	40.0	none	0
65	0.52	Coniferous plantation	Pw8 Ce1 ( Aw Bt El )1	23	50	23	973	41.0	none	0
66	0.45	Mixedwood	Ce6 Bw2 Bd1 Po1 ( Pw Cb El )	20	60	17	1290	39.0	Po10	500
69	0.90	Bottomland mixedwood	Ce4 Ald3 Ab1 Aw1 Bd1 ( Bw El )	13	32	14	1417	19.0	Ce7 Ald3	1500
70	1.33	Deciduous plantation	Wi10	21	30	17	870	30.0	none	0
71	0.14	Deciduous plantation	Po5 Bd2 Ce2 Or1	13	30	10	1907	24.0	Bd10	3000
72	0.57	Upland hardwood	Bd4 El2 Ms2 Aw1 Mh1 ( Or )	22	70	26	982	38.0	Aw5 Mh5	2000
73	1.67	Mixedwood	Ce9 He1	18	75	18	1801	44.0	none	0
74	0.93	Deciduous plantation	Po6 Lb3 Wi1	18	30	20	522	13.3	none	0
75	11.98	Deciduous plantation	Po8 Ald2	28	39	22	143	9.0	none	0
77	1.29	Deciduous plantation	Or6 Aw1 Bw1 Cb1 El1 ( Po Bt Ce )	23	50	25	603	24.0	Bt5 Cb4 Aw1	2667

COMP	AREA (HA)	FOREST COMMUNITY	SPECIES COMPOSITION (TREES > 9 CM DBH)	DBH (CM) (TREES > 9 CM DBH)	AGE	HT (m)	DENSITY (STEMS/HA > 9CM DBH)	BASAL AREA M2/HA > 9 CM DBH)	ADVANCED REGEN COMPOSITION	ADVANCED REGEN DENSITY (STEMS/HA)
78	1.28	Deciduous plantation	Po8 Al1 ( Ald Wi )1	24	30	21	307	13.3	none	0
79	0.20	Bottomland hardwood	Bd6 Wi3 Ag1 ( Aw Mh )	19	60	20	663	18.0	Bt8 Aw2	2500
80	0.11	Bottomland hardwood	Wi10	38	50	22	108	12.0	none	0
81	0.12	Coniferous plantation	Pr7 Aw2 Pw1 ( Cb )	20	65	23	1475	46.0	Bt7 Cb3	3000
82	1.26	Deciduous plantation	Po8 Wi2	24	30	12	587	26.0	none	0
86	0.31	Bottomland hardwood	Wi10	47	60	25	103	18.0	none	0
88	4.39	Coniferous plantation	None present	9	5	2	0	0.0	Sw5 Ce3 La2	1667
89	0.48	Coniferous plantation	Pr6 Cb2 Bd1 He1 ( Mta )	19	65	22	1033	28.0	Bt10	2000
90	0.65	Deciduous plantation	Or8 Aw1 ( Cb Mh )1	24	65	27	1152	52.0	none	0
91	0.67	Deciduous plantation	Po10	26	30	21	273	14.0	none	0
92	0.13	Deciduous plantation	Po6 Sw4	13	30	17	740	10.0	none	0
93	1.66	Coniferous plantation	Pw9 Pr1	13	18	6	1057	13.0	Sw10	500
95	0.48	Coniferous plantation	Sw6 Aw4	18	50	26	1062	28.0	none	0
96	1.76	Mixedwood	Ce3 Mh2 Po2 Aw1 Bd1 Bw1 ( By La Or )	18	83	26	1261	32.7	Bb4 Ce4 Mh2	1667
97	0.14	Bottomland hardwood	Aw4 Po4 Wi2	18	60	23	1197	30.0	none	0
98	0.20	Bottomland hardwood	Ms6 Mh2 Ab1 Bd1 ( Aw Cb He )	27	100	26	632	36.0	He5 Ab5	667



COMP	AREA (HA)	FOREST COMMUNITY	SPECIES COMPOSITION (TREES > 9 CM DBH)	DBH (CM) (TREES > 9 CM DBH)	AGE	HT (m)	DENSITY (STEMS/HA > 9CM DBH)	BASAL AREA M2/HA > 9 CM DBH)	ADVANCED REGEN COMPOSITION	ADVANCED REGEN DENSITY (STEMS/HA)
100	3.17	Upland hardwood	Mh5 Aw1 Bw1 Cb1 Po1 ( Ab Bd Be Ce El Hi Mr )1	24	100	25	767	34.7	Aw4 Cb2 Mh2 Bt1 Be1	3167
101	5.51	Upland hardwood	Mh8 Bd1 ( Ab Aw Be Bt Cb El He Iw Ms Pw Wi )1	22	100	25	929	36.3	Mh6 Aw2 Cb2	3333
102	1.41	Bottomland hardwood	Ms6 Mh2 Ab1 Bd1 ( Aw Cb He )	27	100	26	632	36.0	Ab5 He5	667
104	0.71	Bottomland mixedwood	Ce8 Aw2	15	70	17	545	10.0	OH10	1000
108	6.80	Bottomland mixedwood	Ce4 Bf2 Bw2 Po1 ( Ab Aw By El He Pw )1	15	80	18	1375	25.7	Mta3 Ab2 Po1 Cb1 ( Ce Mm Mh Bf Aw El )3	3286
109	4.30	Upland hardwood	Mh4 He2 Bw1 Ce1 Po1 Pw1 ( Aw Bd Be Cb Iw Mm Or )	23	97	23	724	31.1	Mh4 Aw2 Cb2 Bt1 ( Ce He )1	2857
113	0.10	Deciduous plantation	Po6 Lb3 Wi1	18	30	20	522	13.3	none	0

## APPENDIX C

### SAMPLE SILVICULTURAL PRESCRIPTION

#### SENECA WOODLANDS COMPARTMENT 36

##### 1. STAND DESCRIPTION (history)

Compartment 36 is a 75-year-old red plantation with a cohort of white pine and several deciduous species. There has not been any previous silvicultural management. There is adequate deciduous regeneration including white ash, black cherry and walnut. European buckthorn is also present in the regeneration. Soils on the site are sandy and are moderate- to well-drained. Topography is flat to rolling. There is good access off the trail system.

##### Compartment Inventory

The stand was assessed in July 2018 and a comprehensive forest inventory was completed.

##### Stand Inventory for Trees $\geq 9$ cm DBH

Species Composition	Age	Height (m)	Basal Area (m <sup>2</sup> /ha)	Density (stems/ha)	Average DBH (cm)	AGS (%)
Pr7 Bw1 Mh1 Pw1 ( Aw Cb Ms Or )	75	22	38	1050	22	95

##### Stand Structure

Size class	Poles (10 – 24cm)	Small (26 – 36cm)	Medium (38 – 48cm)	Large (50cm +)	Extra Large (50cm+)
Basal area (m <sup>2</sup> /ha)	19	18	1	0	0
Density (stems/ha)	772	274	4	0	0

##### Regeneration Assessment

Size class	Species Composition	Quantity (stems / ha)
Seedlings (<1.4m tall)	Aw5 Cb2 Bt2 Mh1	2000
Saplings (>1.4m tall, < 6cm DBH)	Aw5 Cb2 Wn2 Bt1	2000
Saplings (6-8cm DBH)	Aw7 Mh3	398

##### Competing Vegetation & Invasive Plants

Shrubs in this stand include red elderberry and alternate leaf dogwood. . Ground vegetation includes bedstraw and wild grapevine.

##### Habitat Features

Habitat features include a moderate number of snags and some coarse woody debris. No stick nests were observed in the stand during the July 2018 assessment.

### **Species at Risk**

A search of the Natural Heritage Information Centre (NHIC) database revealed that Jefferson salamander (*Ambystoma jeffersonianum*) and Butternut (*Juglans cinera*) and have been observed within a 1 km radius of the property, although neither were found in the stand during the 2018 stand assessment. Appendix A provides a description of habitat requirements, recommended protection, and a list of references where more information can be found for each of these species.

## 2. SILVICULTURAL PRESCRIPTION AND TREATMENT GUIDELINES

Short term objectives	Long term objectives
To encourage natural regeneration of deciduous species to maintain and improve the health and vigor of the stand.	Maintain a healthy and productive mixed stand.

Treatment Guidelines	
Implementation Period	<ul style="list-style-type: none"> <li>January – April 15, July 15-December</li> </ul>
Tree Marking & Removal	<ul style="list-style-type: none"> <li>Mark every 3<sup>rd</sup> row for removal. Remove red pine only. Residual stand BA 28-30 m<sup>2</sup>/ha.</li> <li>Retain all hardwoods and white pine unless UGS.</li> <li>Mark dead trees and other hazard trees (Ash) for removal within 20m of any roads or trails.</li> <li>Trees to be marked by Provincial Certified Tree Markers.</li> </ul>
Invasive Plants	<ul style="list-style-type: none"> <li>Buckthorn is present in the regeneration. Apply basal bark treatment to larger stems at least 1 year prior to thinning.</li> </ul>
Harvest Method	<ul style="list-style-type: none"> <li>Shortwood harvester and forwarder is the preferred method.</li> </ul>
Access & Landings	<ul style="list-style-type: none"> <li>Access trails through the property.</li> </ul>
Site Protection	<ul style="list-style-type: none"> <li>All slash should be cleared from roads, trails, seeps, and adjoining stands.</li> <li>Tops should be slashed down to within 1.3m of the ground.</li> </ul>
Wildlife Habitat Considerations	<ul style="list-style-type: none"> <li>Retain snags and cavity trees (where they do not present a safety hazard) according to Provincial guidelines.</li> <li>No stick nests were observed in the stand during the 2018 assessment. Tree markers should be watching for and buffer any stick nests according to MNR raptor nest guidelines.</li> <li>Leave a 30m no cut/no machine buffer along any watercourses and wetlands.</li> </ul>
Protection for Species At Risk	<ul style="list-style-type: none"> <li>Review attached habitat requirements and protection guidelines for Jefferson salamander and Butternut. Tree markers to postpone marking and contact the prescription author if these or other species at risk are found.</li> </ul>
Utilization Standards	<ul style="list-style-type: none"> <li>All merchantable trees should be utilized down to a 10 cm (4") top diameter at 2.7 m (8'6") log length.</li> <li>Stump heights should not be any higher than the diameter of the stump and not to exceed 50cm regardless of diameter.</li> </ul>
Workplace Safety	<ul style="list-style-type: none"> <li>The contractor's operations shall be carried out in accordance with the Occupational Health and Safety Act, R.S.O. 1990, c.o.1. as amended.</li> <li>Fell hazard trees prior to commencing other harvesting activities.</li> <li>Partially severed and lodged trees should be felled or pulled to the ground immediately.</li> </ul>
Harvest Monitoring	<ul style="list-style-type: none"> <li>Harvest operations will be monitored by Silv-Econ Ltd. A harvest inspection form will be completed during each inspection and maintained on file.</li> </ul>
Post-Harvest Inventory	<ul style="list-style-type: none"> <li>The forest inventory for the compartment will be updated after the silvicultural activities have been completed.</li> </ul>

## Appendix A: Species At Risk

### Jefferson salamander

**Status:** Endangered provincially and nationally.

**Range:** Jefferson salamander is found in southern Ontario, mainly along the Niagara escarpment, as well as the northeastern US (OMNR 2014). Known populations in Ontario as of 2010 occur in Haldimand, Norfolk, Wellington, Brant, Grey and Elgin counties; forested habitat along the Niagara Escarpment from Hamilton to Orangeville; isolated locations in Halton, Peel, Waterloo, York and Niagara regions; and, Dufferin County east of the Niagara Escarpment (JSRT 2010).

**Habitat:** Deciduous or mixed forest. Require microhabitat, such as moist, loose soil under logs or in leaf litter. Uses wetland ponds to breed - these are usually vernal pools (without predators) fed by groundwater, snowmelt or surface water, but occasionally permanent or semi-permanent water (JSRT 2010). Ponds are usually in, or adjacent to a woodland. The salamander needs plant materials such as shrubs, twigs, branches, or submerged or emergent vegetation to attach their egg masses to. They have high breeding pond fidelity. The habitat used by the salamanders extends to 157m from the edge of their breeding ponds (Faccio 2003).

**Threats:** Habitat loss and degradation of woodlands and breeding ponds due to urban development, draining of wetland and resource extraction (OMNR 2014). Widespread aggregate extraction in the Niagara Escarpment is an especially significant threat (JSRT 2010). There are small populations of salamanders in isolated pockets, therefore, there is a risk of local extinction due to floods, fire or other catastrophic events. Other mortality factors include road mortality or an altered water table. Anything that alters the water table or disrupts groundwater flow has the potential to alter wetlands and therefore breeding habitat as well. Removal of forest cover can lead to premature drying of vernal ponds. Forestry activities that result in the filling of vernal pools, alternation of vernal pool hydrology, sedimentation, removal or alteration of associated upland habitat (removal of canopy cover, stumps, logs and leaf litter, and alternation of nutrient input by leaves), pollution and fragmentation or isolation of vernal pools from the terrestrial habitat (JSRT 2010).

**Recommendations:** Protect vernal pools and breeding ponds from draining, filling, run off and development. Maintain forested land around known breeding ponds. Use a no cut buffer of 15-30 m around vernal pools or pool depressions. Up to 140m from the pool (or 180m if possible) retain 70% or more of the area with 75% or more canopy cover or equivalent basal area, of trees 9m or more in height distributed proportionally around the pond (NHESP 2007). If vernal pools are clustered, patch cuts or landings should not be located between the pools. Vernal pools are difficult to detect in the dry season so should be carefully surveyed and marked prior to forestry operations. Where possible leave 2 snags or older/dying trees per acre to provide woody debris. Leave sections of downed wood of 30cm diameter and larger (40cm or more in length) for microhabitat. Maintain existing woody debris. Winter harvest is best to minimize forest floor disturbance (NHESP 2007).

#### References:

COSEWIC. 2010. COSEWIC assessment and status report on the Jefferson salamander *Ambystoma jeffersonianum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.

Faccio, S.D. 2003. Postbreeding emigration and habitat use by Jefferson and spotted salamanders in Vermont. *Journal of Herpetology*. 37: 479-489.

Jefferson Salamander Recovery Team. 2010. Recovery strategy for the Jefferson Salamander (*Ambystoma jeffersonianum*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario.

## Butternut

**Status:** Endangered provincially and nationally.

**Range:** Central and eastern North America, in Canada found in Ontario, Quebec and New Brunswick. In Ontario butternut is found in the southwest, north to the Bruce Peninsula and south of the Canadian Shield (OMNR 2014).

**Habitat:** Rich moist sites in tolerant hardwood forest in the southern parts of the Great Lakes-St Lawrence forest. Shade intolerant – often found in gaps and on forest edges. Often found along streams. Also, may be found on well-drained gravel sites and rarely on dry rocky soil (OMNR 2014).

**Threats:** Threatened by an introduced pathogen – the butternut canker (*Ophiognomonia clavigerenti-juglandacearum*) that is ubiquitous across the range of butternut (Poisson and Ursic 2013). Although no trees are known to have resistance to the pathogen, indiscriminate harvesting of butternut could remove genetic material which has not yet developed resistance, or which has resistance that is not yet detected (in Poisson and Ursic 2013).

**Recommendations:** Maintain healthy butternut individuals and remove non-retainable ones. Healthy butternut are those that have more than 70% live crown, and less than 20% of the combined circumference (dbh) of the bole and root flare affected by cankers, or, that have 50% or more live crown and no cankers visible on the bole or root flare (OMNR 2010). Develop suitable stand conditions for butternut; butternut shows more vigour and regeneration in open conditions. Selection harvest parameters developed for butternut are: in pockets  $\geq 0.5$  ha within stands with 5-15 healthy butternut group selection openings of 30-70m diameter should be created, retain healthy butternut seed trees along openings, within openings fell all stems except retainable butternut, and employ competition control if necessary. For shelterwood systems, in pockets  $\geq 0.5$  ha within stands with  $>5$  healthy butternut use a uniform shelterwood system with full crown spacing, retain 30-60 trees/ha at 12-20 m spacing, fell non-crop trees, and use control competition if necessary (OMNR 2010; in Poisson and Ursic 2013). Forest management plans should identify opportunities for butternut regeneration (OMNR 2010). Most butternut seedlings establish within 25-50m of parent tree, therefore it is recommended to maintain a protected area within 25m from the base of an established, healthy tree where the species has the highest likelihood of regenerating (Poisson and Ursic 2013).

### References:

Poisson, G., and M. Ursic. 2013. Recovery Strategy for the Butternut (*Juglans cinerea*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario.

OMNR. 2014. Butternut

[http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR\\_SAR\\_BUTTERNUT\\_EN.html](http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_BUTTERNUT_EN.html)

[Accessed June 2014]

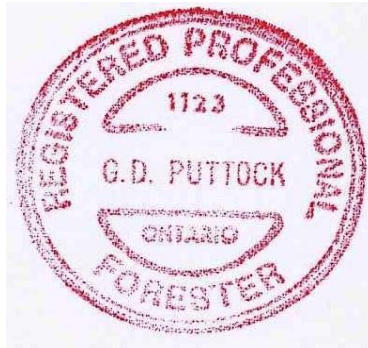
OMNR. 2010. Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales. Toronto: Queen's Printer for Ontario

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June 8, 2018



Note: A property map showing the location of the compartment would be included with the prescription.