

# CITY OF BEACONSFIELD

## Tree Policy

DOCUMENT PREPARED ON  
DECEMBER 10<sup>TH</sup> 2001

IN COLLABORATION WITH THE CITY, BY



**LUC NADEAU**  
**Forest Engineer Consulting Arborists**

---

3520 Marian St., Suite 304, Laval, QC, H7P 4T9  
phone: (450) 628-1291 (514) 898-3848 fax: (450) 628-6196  
[www.arbres-conseil.com](http://www.arbres-conseil.com) [lucnadeau@arbres-conseil.com](mailto:lucnadeau@arbres-conseil.com)

# TABLE OF CONTENTS

---



---

<b>1.</b>	<b>INTRODUCTION</b> .....	<b>1</b>
<b>2.</b>	<b>GENERAL OBJECTIVES</b> .....	<b>2</b>
2.1.	Trees and the Environment	
2.2.	General Objectives .....	2
<b>3.</b>	<b>IMPLEMENTATION</b> .....	<b>5</b>
3.1.	Maintaining the City’s Rural Character .....	5
	◆ PROPOSED GUIDELINES	
	a) Replacement of Felled Trees.....	5
	b) Anticipated Replacement Plantings .....	5
3.2.	Improving the City’s Rural Character .....	6
	◆ PROPOSED GUIDELINES	
	a) Planning Natural Screens .....	6
	b) Planning New Wooded Areas .....	6
3.3.	Planting – Selection of Species and Locations.....	6
	◆ PROPOSED GUIDELINES	
	a) Indigenous Species .....	6
	b) Dimension of Trees .....	7
	c) Diversification of Species .....	7
	d) Planting Locations.....	7
	e) Avenues of Distinctive Character .....	7
	f) List of Suggested Species.....	7
3.4.	Planting – Maintenance .....	8
	◆ PROPOSED GUIDELINES	
	a) Quality of the Trees.....	8
	b) Watering .....	8
	c) Mulch .....	8
3.5.	Pruning and Training of Trees.....	9
	◆ BASIC PRINCIPLES .....	9
	◆ PROPOSED GUIDELINES	
	a) Maintenance Pruning.....	9
	b) Clearance of Infrastructures .....	9
	c) Thinning Out and Topping .....	10
	d) Natural Surroundings .....	10
	e) Training Young Trees .....	10
	◆ ABSTRACT .....	10

3.6.	Cyclical Pruning .....	11
	◆ ABSTRACT .....	11
	◆ PROPOSED GUIDELINES	
	a) Cyclical Pruning.....	11
3.7.	Felling of Trees .....	11
	◆ PROPOSED GUIDELINES	
	a) Motives for Felling.....	11
	b) Natural Areas.....	12
3.8.	Inspection of Tree Condition.....	12
	◆ PROPOSED GUIDELINES	
	a) Increased Frequency of Inspections .....	12
	b) Evaluation of Groups of Trees Targeted for Specific Needs.....	12
3.9.	Preservation of Outstanding Trees .....	13
	◆ PROPOSED GUIDELINES	
	a) Outstanding Trees .....	13
	b) Maintenance and Preservation .....	13
3.10.	Preservation of Public Trees.....	13
	◆ GENERAL .....	13
	◆ PROPOSED GUIDELINES	
	a) Protection Perimeter.....	14
	b) Excavation Inside the Protection Perimeter .....	14
	c) Circulation Inside the Protection Perimeter .....	15
	d) Permanent Raising of the Soil Level.....	15
	e) By-laws: Damage or Vandalism.....	15
3.11.	Planning Zones of Natural Vegetation .....	16
	◆ ABSTRACT .....	16
	◆ PROPOSED GUIDELINES	
	a) Selection Method Silviculture.....	16
	b) Goals of Selection Method Silviculture .....	17
	c) Evaluation of Impacts.....	17
	d) Intervention Requirements .....	17
	e) Generalized Thinning or Total Cut of Undergrowth.....	17
	f) Collection of Dead Leaves .....	18
<b>4.</b>	<b>CONCLUSION .....</b>	<b>19</b>
<b>APPENDIX 1:</b>	<b>Roles and Functions of Trees .....</b>	<b>iii</b>
<b>APPENDIX 2:</b>	<b>List of Species for Planting .....</b>	<b>v</b>

# 1. INTRODUCTION

---

---

One of the City of Beaconsfield's main attractions is, without doubt, the large number of remarkable trees to be found within its borders. These trees are large and found in great number, both in the city's green spaces (parks, river banks and woods) and on residential property. The result is a unique place that many rightly call the "Country Town".

The citizens of Beaconsfield benefit from the intimate character that this vast array of arboreal vegetation creates. It is this same rich quality that lures new residents to settle here and put down roots. In fact, we like to think that Beaconsfield "chooses" its citizens as much as its citizens choose Beaconsfield.

It is in the City's interest and that of its population to maintain and to invest in its "tree capital" so that it may continue to benefit from this quality of life and this special environment. Without its abundance of trees, the whole idea of a *Country Town* is lost.

This *Tree Policy* addresses those trees that are in the public domain only, i.e. trees belonging to the City of Beaconsfield that are located on streets or in parks, natural woods and the City's other green spaces.

## 2. General Objectives

---

---

### 2.1. Trees and the Environment

Trees are an indispensable resource for the survival of the Earth, especially when we consider global warming that threatens its very existence. In fact, trees soften the climate with their shade and their evapotranspiration process. Finally, they filter dust and atmospheric pollutants from the air.

In addition to adding value to their property, for the citizens of Beaconsfield, trees guarantee a better quality of life in many respects. Trees:

- alleviate noise and camouflage unsightly objects
- offer various aesthetic attractions: flowers, autumnal colouring, etc.
- cool and purify the surrounding air
- impart a private character to properties
- control winds
- provide a micro-refuge and food source for wildlife, especially birds
- reduce heating and air conditioning costs
- delimit and enhance the beauty of landscapes

In fact over and above their functional and aesthetic roles, trees constitute an essential element for the emotional and mental health of people. Trees qualify as excellent anti-stress agents in the urban milieu. Illustrations of some of these roles are presented in *Appendix 1*.

### 2.2. General Objectives

Assuming that the City of Beaconsfield is aware of its territory's potential and the important role played by trees, we recommend that the City agree to adopt the following objectives as its management policy of public trees:

- ➔ Maintain the rural character of the territory by replacing those trees that require felling (\*)
- ➔ Plan replacement of old trees by prior planting of new trees
- ➔ Improve the “forest” ambiance and shade in parks while maintaining open or sunny areas, in accordance with the functions and uses defined for each of them (\*)

- ➔ Continue to shut out undesirable views (e.g. highway, railway track, backyards) with planned screens of vegetation (\*<sup>1</sup>)
- ➔ Favour the use of indigenous species in new plantings (\*)
- ➔ Maintain and reinforce if necessary the distinct character that exists on certain streets – e.g. the regular alignment of a single species – by using the same species or similar species (size, structure of branches, texture of foliage, density of the crown) (\*)
- ➔ Use planting methods that permit reduced maintenance costs in the short and long term, e.g. by using natural mulch (\*)
- ➔ Favour a basic maintenance pruning in keeping with the rural look of the tree over any other type of pruning (\*<sup>2</sup>)
- ➔ Prune young trees after planting (\*)
- ➔ Conduct basic cyclical pruning of trees (every 7 or 8 years) to reduce the risk of dead or dangerous branches falling to the ground (\*)
- ➔ Prohibit felling of trees except when absolutely necessary and for serious reasons of safety, serious nuisance or death (\*)
- ➔ As needed or on a regular basis, evaluate the condition of certain targeted groups of trees, especially for reasons of safety.
- ➔ Create a register of public trees that are deemed to be outstanding or of very great value, and adopt measures to ensure their preservation
- ➔ Adopt measures to ensure preservation of public trees during construction, renovation or landscaping work taking place close to them
- ➔ Aim to conserve an optimal ecological level (diversity of species, natural regeneration of the tree stratum) in areas of natural vegetation (woods, natural screens, banks of streams, etc.) by gentle silviculture management techniques, in keeping with the desired purpose of the green space (\*<sup>3</sup>)
- ➔ Take into account the positive and negative impacts on the wildlife, especially birds, of all interventions in natural green spaces
- ➔ Leave the fallen leaves on the ground in the autumn in green spaces, as in nature, to create a layer of natural organic material (\*)
- ➔ Publicize and promote the tree policy at all Municipal and public functions

---

<sup>1</sup> This objective is currently being realized.

<sup>2</sup> The pruning methods currently in practice already partially meet this objective.

<sup>3</sup> A very recent objective, implemented for the first time in the autumn of 2000 when working in a wooded area.

It should be noted that for a large number of the stated objectives on the preceding pages, their adoption would merely serve to officialize the actual practices of Beaconsfield City management. An asterisk placed at the end of the sentence (\*) identifies these objectives.

## 3. IMPLEMENTATION

---



---

Details regarding application of the rules or general principles recommended as well as the elements of comprehension required to implement the proposed tree policy's objectives (see previous chapter) are as follows:

### 3.1. Maintaining the City's Rural Character

#### PROPOSED GUIDELINES:

##### •a) Replacement of felled trees

⇒ In order to maintain the area's current level of rural character, the City must replace felled trees with new plantings within two years, wherever space and conditions permit.

⇒ If it is not possible to plant in the same area where the tree was felled, compensatory planting must take place in another location where there is adequate space for this tree. In this case, areas that are in need of more trees should be favored.

⇒ This planting (choice of species, location . . .) must be in accordance with the philosophy set forth in *Paragraph 3.3* with regard to the choice of species and its location.

##### •b) Anticipated Replacement Plantings

⇒ In cases where we are able to determine that a row of trees on a street is becoming senescent (aging by progressive decline and death), the City must plan for succession of the trees 10 to 20 years before the old and declining trees are felled. This planting should first be used to fill the available existing spaces where there is an absence of trees.

This procedure should ensure some continuity over time by the presence of good-sized street trees within an alignment. If, on the contrary, no advanced planting takes place, felling all the trees in a row over a period of several years would have the effect of completely denuding the street of its arboreal vegetation for the next 15 years.

This scenario could apply, above all, in the case of the Norwegian maple whose useful lifespan is about 80 years, rows of which are found in whole sections of Beaconsfield.



## 3.2. Improving the City’s Rural Character

### PROPOSED GUIDELINES:

⇒ In order to reinforce the rural character that may be lacking or in need of significant improvements in certain areas, for various reasons, the City should favor an approach that studies the possibility of including tree plantings, in the following cases, for example:

#### •a) Planning Natural Screens

⇒ Planning natural screens to camouflage or hide undesirable views (e.g. highway, railroad track).

#### •b) Planning New Wooded Areas

⇒ In parks and green spaces where justified and where space permits, the City could consider creating new “forest” areas. However, these new areas should respect the uses and functions defined for each of the sites. Also, these areas should not be to the detriment of sunny areas that are also sought by park users.

⇒ The development of these new wooded areas would:

- create natural corridors linking current wooded areas that are now separated;
- camouflage residential backyards that border on parks, thereby ensuring increased privacy for the residents while maximizing the quality of the green space for the users;
- favor retention or attraction of certain birds by planting specific species;
- create shady areas for special uses (e.g. picnic areas);
- generate green spaces alongside watercourses.

## 3.3. Planting – Selection of Species and Locations

### PROPOSED GUIDELINES:

#### •a) Indigenous Species

⇒ In the framework of its new plantings, the City of Beaconsfield should favor and give priority to indigenous tree species.

It is generally agreed that these are usually more adapted to the local environment. In addition, their aesthetic characteristics are judged to be more compatible with the type of landscaping that the City of Beaconsfield would like to maintain, i.e. country-like, with a more attractive autumnal coloring.

- b) Dimension of Trees

⇒ In order to create the desired ambiance, the City should favor species that have a wide spread at maturity, given that residential land areas often permit using trees of these dimensions.

- c) Diversification of Species

⇒ Ideally, the species selection for the whole of the City should be based upon a diversification of the above.

This would inhibit the risk of loss due to insect invasion and/or diseases in keeping with municipal laws banning the use of pesticides. Therefore, it is in the interest of the City to ensure that the same species is not too highly concentrated in any one section (small quarter) of its territory, unless required by specific restrictions (e.g.: avenues with distinctive character, areas with high salt spraying). This method for planning new plantings is recommended by authors on this subject as well as most of the urban forest planners in North America.

- d) Planting Locations

⇒ Planting locations should be selected taking into account the buildings, underground infrastructures (drains, etc.) and overhead infrastructures (lamp posts, etc.), and to a lesser extent roads and highways, to avoid long-term maintenance problems.

By doing this, the City will save considerably on pruning costs related to repetitive clearance of infrastructures.

- e) Avenues of Distinctive Character

⇒ Several species of trees have given a distinctive character to some avenues. This character should be maintained by planting the same species, or others esthetically similar (dimensions, structure of branches, texture of foliage, density of the crown).

For example, red maple might make a good substitute for silver maple due to its similar characteristics. That also goes for red oak, which for a good part is similar in terms of density and summer foliage color to replace the Norway maple.

Lakeshore Road is a good example: the rows of ash (interrupted in spots) give the street a rural character and a particular look. Using a multitude of species would diminish its attractiveness. Many streets have rows of trees that must be preserved, for example: St-Louis, Lakeshore, Fieldfare, St-Andrew, Sherbrooke, Cadillac, Old Church.

- f) List of Suggested Species

⇒ Other than in exceptional and justifiable cases, the species that the City should keep for planting purposes are listed in *Appendix 2*.

### 3.4. Planting – Maintenance

#### PROPOSED GUIDELINES:

##### •a) Quality of the Trees

⇒ For plantings of ornamental trees (40 mm diameter and up), the City should, in its criteria, favor the selection of trees with a single straight trunk, whose lateral branches are well spaced and free from structural weaknesses at their attachment point, and with a single leader at the top.

Once trees that meet these simple quality criteria are planted, a significant reduction of costs will follow in the short term with regard to young tree pruning, work that is only performed to correct structural defects. Over the long term (20 years and more), the maintenance costs, especially pruning – will also be noticeably reduced because these trees are less subject to damage during storms – damage that often occurs where structural defects have existed since the trees were very young.

In addition, trees that are already well structured when planted have a better physiological and hormonal balance. A significantly higher post-planting recapture rate follows, together with a reduced risk of the tree being attacked by insects or disease.

##### •b) Watering

⇒ Ornamental trees must always be watered regularly (every 7 to 10 days) in the first year after planting. Given that environmental conditions are more difficult for trees planted on boulevards, supplementary watering may also be required during dry periods that might occur during the second year after planting.

⇒ In the case of renaturalization plantings where very young trees are used (grown in multiple holes), watering may be limited to one single time, at the time of planting. The very nature of the production of the plants used, their small size, their great adaptability, use of natural mulch, low unit cost of the plants and type of management (in a natural environment), permit such an approach without in any way affecting the post-planting rate of loss and the quality of management obtained.

##### •c) Mulch

⇒ It is recommended to use natural mulch around planted trees, for both the planting of ornamental trees and those for renaturalization purposes, as is the current City practice.

The mulch reduces the impact of dry summer periods on the survival of the trees for several years following their planting by maintaining a certain degree of humidity in the soil. As a result the City will be able to economize on both manpower and machinery costs for watering the trees. The mulch, when applied in a thick layer, inhibits the growth of weeds. Using natural wood mulch (chips from pruning) enables the City to recycle organic residue. In fact, decomposition of the wood chips over the years will add organic matter to the soil, especially in naturalization projects where the soil may be essentially composed of backfill of a less fertile nature.

### 3.5. Pruning and Training of Trees

#### **BASIC PRINCIPLES:**

All public trees in rows on streets, in parks or woods must preserve their natural bearing, their characteristic shape and dimension, if we want the trees to develop as naturally as possible. We must therefore avoid shaping the tree by human interventions that will eliminate its natural character.

Beaconsfield's large bodies of land permit the trees to expand freely without constraint. Also, the availability of space enables the citizens to live in "harmony" with the trees that surround them.

A tree can live very well, even better, without human intervention and its growth is a function of the environmental conditions that surround it. The tree is generally capable of determining what is good for it on a physiological level. Generally, when we stop to consider how vegetation works, we understand that we do not need to take additional measures, but rather know how to appreciate it as it is.

A well-structured tree generally resists damage from storms much better. However, structural problems are much more easily resolved and are less costly when the tree is young (newly planted) by training. Also, a well-structured tree is generally in better physiological health and develops more harmoniously.

#### ◆ **PROPOSED GUIDELINES:**

##### •a) Maintenance Pruning

⇒ In keeping with the above, a single basic maintenance pruning is recommended for public trees. Pruning of trees would then be limited to safety pruning (ref.: standard NQ 0605-200-IV), which consists of essentially removing branches that are dead, sick, dangerous, weak and interfering.

##### •b) Clearance of Infrastructures

⇒ In some cases, pruning may also include the clearing of public right of way, essential for good traffic circulation, as well as other infrastructures where necessary. The clearance tolerances proposed are as follows:

- buildings (including the roof) .....3 m
- vertical clearance above the street.....4.25 m
- vertical clearance above sidewalks, parking lots and land.....3 m

•c) Thinning Out and Topping

⇒ Thinning of the crown and topping are not practices that should be performed by the City of Beaconsfield as they affect the shape and/or the natural appearance of the crown, and are contrary to the principles outlined above as well as to the general goal of the “Country Town”.

•d) Natural Surroundings

⇒ In the case of woods and other green spaces of a natural character, pruning should be limited to trees close to footpaths, and those situated on the boundaries as well as those close to areas containing play equipment.

•e) Training Young Trees

⇒ In order for young trees to properly develop in the future, pruning should take place, two or three times, during the first eight years after planting. This will:

- encourage the development of a single straight trunk
- obtain a single strong leader growth at the top of the crown
- eliminate weak, interfering and dead branches
- space and adequately spread out future primary structural branches of the crown
- progressively clear the trunk of inferior lower branches

**ABSTRACT:**

For the City of Beaconsfield, it is more a question of intervening in a timely manner with these trees than on a systematic basis or in regular cycles. In fact, City authorities currently practice this management philosophy. The principle here is to do only what is essential to protect the safety of people and assets and the good health of the tree.

On the other hand, cyclical pruning of a tree once it has reached a certain age of maturity (60 years and over) tends to do more harm than good to the health of the tree, according to observations in other towns in the Montreal area.

Finally, this approach of timely, gentle interventions limited to essentials will keep the City’s pruning costs down. This is particularly true if the City’s trees already have well-structured branches and trunks that permit them to better resist destructive climatic events. Training young trees therefore becomes of primordial importance for the future. All the more since young tree pruning is far less costly than pruning once the tree is older or following a crisis (ice storm, etc.). The tree’s life is thus prolonged, as damage is reduced.

### 3.6. Cyclical Pruning

#### ABSTRACT

Given that trees are living organisms in constant evolution, notably by the growth of existing branches and the death of others, the City must prune its trees regularly. Regular and systematic pruning of the trees in a sector is a preventive measure as it enables elimination of dead branches in the crown. This also contributes to improved safety for individuals and reduces the risk of monetary claims for damage to assets. The City must therefore act in a responsible manner by performing regular maintenance of its trees for the benefit of its citizens.

Should the City only act on request or following complaints from citizens, the trees' safety would be affected because experience demonstrates that most people are unable to detect potential problems, especially those that involve safety.

#### PROPOSED GUIDELINES:

##### •a) Cyclical Pruning

⇒ For the reasons set forth in the preceding paragraphs, we believe that it is in the City's best interest to continue cyclical pruning of its trees according to current parameters:

- a 7 to 8 year intervention cycle covering a different sector each year
- the pruning team visually examine all public trees in a sector and, if necessary, prune them
- maintenance pruning for clearance of infrastructures only is performed.

An interval of 7 to 8 years between prunings, as currently advocated, appears to be an acceptable compromise between the criteria of safety and maintenance costs. However, extending this interval to 9 to 10 years could have disastrous consequences for the safety of assets and people. Generally, we observe that any dead branch of 10 – 15 cm in diameter or larger in the crown of a tree ends up falling to the ground by itself after 5 years at the most.

### 3.7. Felling of Trees

#### PROPOSED GUIDELINES:

##### •a) Motives for Felling

⇒ The City of Beaconsfield representative should never accept felling of a public tree (streets, parks, green spaces, woods) unless that tree poses a serious threat to the safety of assets and/or people, or causes a serious nuisance.

⇒ A tree will be deemed dangerous when the use of alternative arboricultural interventions, such as pruning away the problem area, will not make the tree safe. Also, a tree will be deemed a "serious nuisance" when there is concrete proof that it causes significant damage to property (public or private) and if the use of the alternative arboricultural interventions, such as clearance pruning, does not resolve the nuisance problem, even temporarily. However, the alternatives

must not be used to the detriment of the tree's integrity, or incur for the City excessive costs for work and follow-up of the tree's contributive monetary value.

- b) **Natural Areas**

⇒ In order to provide a nesting area for winged wildlife within natural wooded areas and other areas of this type, it is justifiable to leave the trunks of large dead trees (25 cm diameter and up) standing, as well as short sections of the principal large branches.

⇒ If the tree is in the direct view of a residence, justification for leaving the trunk of a dead tree standing must be agreed to by the residents concerned, given that doing so might diminish the visual quality of their environment.

### **3.8. Inspection of Tree Condition**

#### **PROPOSED GUIDELINES:**

- a) **Increased Frequency of Inspections**

⇒ It would be desirable for the City to inspect or have inspected certain groups of targeted trees more frequently, principally for reasons of security. Trees affected by this recommendation are the large old and remarkable trees that present, or could eventually present problems, and that are situated in highly frequented areas of some parks. Inspections should take place every year or two years at the most, and should preferably be done by an expert in the field.

We could, for example, think of some of the big trees that present potentially problematic anomalies around Centennial Hall where activities (e.g. Canada Day, picnics) that draw large crowds occur. We could also mention St-James Park where there are also trees that meet these criteria.

- b) **Evaluation of Groups of Trees Targeted for Specific Needs**

Occasionally, the green spaces manager might need to evaluate the nature of some specific problems indicated in some tree populations or in a given sector of the territory, as well as their degree of importance (the number of trees involved, magnitude of the problem).

⇒ In this context, it would be advisable for the City to call upon the services of an urban forestry expert for an in-depth evaluation of the situation and of the various options available to the City. Without going into a systematic examination of all the trees that may potentially have a specific problem, a sample evaluation could be performed. A sample evaluation, while almost as accurate as a systematic evaluation, would be far less costly for the City.

For example, it has been remarked that there seem to be many cases of open forks in Norway maples in the City. The open forks might require cabling and/or bracing to reinforce them and thereby reduce the risk of accidents. On the other hand, before determining if there is really a need for this type of intervention and to what extent it is required, a sample evaluation could assist the manager to properly outline the situation.

### 3.9. Preservation of Outstanding Trees

#### PROPOSED GUIDELINES:

Outstanding trees, or highly valuable trees, bring a special and unique contribution to the City of Beaconsfield's arboreal or forest heritage. They should therefore benefit from a special commitment by the City through exceptional attention to their maintenance and their preservation.

#### •a) Outstanding Tree

⇒ A public tree may be deemed outstanding or of very great value by the City for various reasons, such as: exceptional size for this species in Beaconsfield's territory, rare species, heritage, special landscaping contribution, high aesthetic interest.

⇒ Trees deemed to be outstanding must be registered as such in the City's registry in order to take these trees into account with regard to any intervention on them or in their proximity.

#### •b) Maintenance and Preservation

⇒ As an exception, it may be in the City's interests to contemplate using arboricultural measures other than pruning to ensure the good health and preservation of these trees. This arboricultural work would mostly entail cabling and/or bracing of structural defects (e.g. repairing the main fork of a weak or open branch), or even fertilization to improve the tree's health and thereby enable it to withstand parasite attacks for example.

⇒ As well, operations that could occur in the vicinity of a tree that bears this status should first be evaluated, at least summarily, with regard to their impact. This work should be performed in such a manner as to limit the impact on the good condition of this tree to a minimum, notably with regard to work carried out near the roots. The work should be performed in conformance with the guidelines set forth in *Paragraph 3.7* relating to the preservation of trees when performing construction or landscaping work.

### 3.10. Preservation of Public Trees

#### GENERAL:

Currently in *By-law 704*, the City of Beaconsfield essentially only covers the prohibition of the felling of public trees. It does not really have concrete tools to ensure the preservation of public trees, more specifically in cases where private subcontractors, acting on behalf of residents, perform various work, residential renovation or landscaping around a tree belonging to the City. Also, in clause 4 of *By-law 704*, the technique described for preserving public trees appears to us to be completely insufficient and inefficient and will in any case inevitably result in the death of a large majority of trees "protected" in this manner.

During this type of work (construction, renovation, landscaping) physical damage by machinery may occur in the form of injuries and breakages, especially to the trunk or the main lower branches. But above all, damage may be caused to the roots in two different ways:

- the packing down of soil due to the circulation of machinery around the tree , or the



- temporary storage of soil or material, or permanent raising of the land level
- breaking a large number of anchoring roots during excavation or topsoil stripping.

In the first case, (packing down of soil) this will cause the tree to decline, often irrevocably, which could lead to its death within a period of three to six years. But this decline is insidious in the sense that the first visible symptoms will generally not show until two to three years after execution of the work. Unfortunately, at this point it is often already too late to intervene.

In the second case (breaking of roots), the breakage of a large number of anchoring roots often creates situations that promote rotting of the whole anchoring root system that remains intact, in addition to the potential decline of the crown. The tree may then be subject to uprooting by strong winds over the medium to long term.

### **PROPOSED GUIDELINES:**

#### **•a) Protection Perimeter**

⇒ A minimum protection perimeter around the tree must be established to prevent circulation of any machines, storage of soil or materials, any type of excavation, spillage of toxic substances or permanently raising the actual level of the land. This perimeter should be outlined by a fence at least 1.2 meters high, which should be erected for the duration of any work (construction, renovation, landscaping).

⇒ Minimum dimensions recommended for the protection perimeter are in accordance with the size of the tree:

Protection perimeter distance (radius) =  $8 \times \text{DBH}$   
(measure taken from the tree trunk)

DBH: diameter of the tree trunk measured 1.4 m above ground level

*Example: a tree with a 30 cm diameter trunk would have a protection perimeter radius of 2.4 m all around the trunk.*

⇒ The maximum size proposed for the protection perimeter of a tree is 4.5 m radius.

This perimeter constitutes a minimum to provide minimum protection of the anchoring root system as well as a certain amount of the smaller roots used for absorption of water and mineral elements and the flow of sap. In the case of an “outstanding” tree [see *Paragraph 3.6*], it might be appropriate for the City to increase the radius of protection to 12 or 15 times the diameter of the trunk, up to 7.5 m. This would protect most of the rootlets and the feeding roots (less than 2 cm in diameter), and ultimately result in reducing the risk of decline subsequent to this work to a very low level.

#### **•b) Excavation Inside the Protection Perimeter**

⇒ In the case where excavation is required inside the protection perimeter, such as repair work on water pipes or sewers, among others, steps to shore up the ground must be adopted.

This approach would permit the size of the trench or pit opening to be limited, as well as enable vertical excavation.

⇒ Even so, all root sections that are exposed to the air or that have been broken must be properly cut at right angles in order to fill the excavation pit.

This step, while appearing banal, generally permits a tree to recover more easily from the harmful consequences of losing roots, facilitates growth of new rootlets, and limits rotting of the anchoring root system.

⇒ During final clean up of the trench or pit, the final 30 cm of surface soil must be composed of topsoil to facilitate the formation of new roots.

⇒ It is also strongly recommended that the tree be watered every 15 days, especially during dry periods, for the first two years following the excavation.

⇒ When the closest section of the excavation is less than 2 m from the trunk, it is considered that 50% of the anchoring root system is generally lost for trees of 30 cm diameter and up. The tunnel method (horizontal drilling) should be used for reasons of safety of people and survival of the tree, otherwise felling of the tree must be anticipated in the short/medium term.

#### •c) Circulation Inside the Protection Perimeter

⇒ In the event that it is absolutely necessary to allow machinery to circulate inside the protection perimeter, a geotextile fabric must be placed directly on the existing soil and covered with a 30 cm layer of crushed stone or wood chips.

This measure will help maintain physical and mechanical conditions and properties of the soil intact, and avoid any type of asphyxiation of the underlying root system.

#### •d) Permanent Raising of the Soil Level

⇒ For any permanent raising of the soil level over 20 cm high inside the protection perimeter of a tree, the following measures must be taken to ensure the tree's survival:

- place a minimum 20 cm thick layer of clean stone ( $\frac{3}{4}$ , 1" or 2") on the ground over the whole of the minimum protection perimeter, separating the layer of clean stone from the natural ground below and the fill above with a geotextile fabric  
(to avoid asphyxiation of the root system)
- create a natural well around the trunk, without disturbing the fill in any way, at a distance of at least 30 to 50 cm from the trunk  
(to prevent rotting of the base of the trunk and thereby preclude danger of the tree trunk breaking during strong winds)

#### •e) By-laws: Damage or Vandalism

⇒ Given that the tree has a contributive monetary value, we believe that the City should claim compensation for any damage (felling, pruning, etc.) done to one of its trees. This compensation should be at least equivalent to the value of the damage or the loss incurred, especially when the amount is in excess of the \$300 fine that is set forth in *By-law 704* with regard to felling a tree without a permit.

In addition, we believe that special by-laws regarding damages to public trees during construction, renovation and landscaping should also be adopted or even added to the current *By-*

law 704. This bylaw should cover all of the items dealt with above [see *sub-paragraphs a, b, c and d*].

### **3.11. Planning Zones of Natural Vegetation**

#### **ABSTRACT:**

The country-like appearance of Beaconsfield's territory is due to the presence of large and small patches of natural vegetation in parks, green spaces, banks of watercourses and the natural screens alongside the highway. These masses of natural vegetation are characterized by the diversity of the vegetation – trees, shrubs, speargrasses and herbaceous plants – and by their diversity in age and species. They also serve as a micro refuge and food reservoir for wildlife, especially birds. Finally, their presence in many cases is justified by the fact that they act as screens to hide undesirable views, or to create greater intimacy for the backyards of riverside residences.

Maintaining, as far as possible, the intrinsic character of these areas and/or the function of some of these natural vegetation areas, may be essential in the long term, so that the population may continue to benefit from these special green spaces. We should also keep in mind that every natural area is a dynamic ecosystem that tends to evolve and transform itself over the course of decades. It might therefore be desirable that the ecological evolution of these areas be in one general direction that will permit these same areas to continue to play their roles (e.g. screens, relaxation, shelter for birds, etc.) in the long term.

Finally, it is also essential that the City does not incur a heavy financial burden due to the maintenance of these areas of natural vegetation.

#### **PROPOSED GUIDELINES:**

##### **•a) Selection Method Silviculture**

⇒ In this context, apart from the pruning of dangerous branches and/or felling of dead trees that may be required, these types of interventions must be limited to undergrowth selection cutting.

This type of intervention is not intensive in nature like the majority of other silviculture methods normally used in the commercial forest. It is very light in nature and well oriented to the micro-ecology of the small sparsely wooded parcels of land on which we wish to intervene. The City of Beaconsfield will, in most cases, only cut limited quantities of young trees (5 cm and less diameter), in a very dispersed manner within a wooded area depending on specified ecological goals [see *Paragraph b*] which follows]. Cutting several young trees spaced 10 to 15 m apart – or even further – will therefore have a negligible visual impact and in most cases will go unnoticed by riverside citizens. In addition, this type of intervention is less costly in terms of manpower and requires few tools.

On the other hand, silvicultural intervention can have the effect of gaining one or two decades in two or three years.

### •b) Goals of Selection Method Silviculture

⇒ Selection method silviculture intervention in the woods and other natural green spaces in Beaconsfield should only be applied to suit one or several of the following objectives:

- increase diversity of tree species and/or ages
- curb the expansion of very undesirable vegetation
- ensure renewal or succession of existing tree vegetation to preserve the natural milieu in the long term [ecological characteristics and/or desired function]
- quickly gain one to two decades in time in the succession process, or renewal of the wooded stratum, or in other words to speed up the regeneration process
- encourage the presence of certain species of birds to camouflage and blend with the sources of unwanted noise.

### •c) Evaluation of Impacts

⇒ Due to the fact that natural areas are complex ecosystems where many factors interact, any planned silvicultural intervention, according to the goals previously defined, must be subjected to a summary study of its impact on wildlife – birds especially – as well as the flora. Preferably, a forest professional or an ecologist should carry out this evaluation.

### •d) Intervention Requirements

⇒ The detailed requirements of selection cutting – which species to cut and which to encourage or preserve, and the intensity of the cut – should be trusted to the care of a forest professional.

Let us state simply that the selection method, even though very light, may be extremely different depending on whether we are looking to encourage a “shady” species or a “semi-shaded” area; and also depending on the degree of presence or absence to which the species should be encouraged, including the large seed trees. One badly planned intervention could modify a natural area in a significantly undesirable way.

### •e) Generalized Thinning or Total Cut of Undergrowth

⇒ The partial thinning of the undergrowth or the total elimination of the lower vegetal stratum (less than 5 m high), for various reasons (safety of users, etc.) is considered to be a totally inadequate practice, which goes against the well being of the natural area. As a consequence, this type of intervention should be completely banned, in no uncertain terms.

- f) Collection of Dead Leaves

⇒ The collection of dead leaves in the autumn inside wooded areas and other natural green spaces should be banned.

Dead leaves are an important element in the ecology of natural areas in the sense that their decomposition by the micro-fauna (insects and bacteria) and the micro-flora (fungi) in the spring maintains fertility of the soil for the benefit of the natural vegetation. In fact, the intensive collection of dead leaves year after year could have the insidious effect, besides depleting and eliminating the humus layer, of encouraging growth of less desirable vegetation to the detriment of the existing vegetation.

## 4. CONCLUSION

---

---

This *Tree Policy* for the City of Beaconsfield has two principal objectives:

- to confirm the City's interest in its trees as an essential component of its territory that it undertakes to preserve.
- to establish in concrete terms the manner in which the administrative authorities will manage this resource

All too often today, we accept trees on the condition that they are not invasive, that they don't really grow, that they don't have leaves or fruit that fall. One of the stakes of the proposed policy is to look at the issue of urban trees from a higher perspective and accept them as useful, beneficial living organisms from many points of view. The public tree has a contributive monetary value, as do all of the municipality's other fixed assets.

This policy presents the tree, among other things, as a solution to some problems due to its role as a screen along Highway 20 for example. The tree is also perceived as an ecosystem in itself, due to the fact that it lives – produces leaves, flowers and fruit – and because it creates an environment with other living things – notably mankind and birds – with which it interacts. From a wider viewpoint, one could even go so far as to state that the tree is an essential component of Beaconsfield's "urban ecosystem" as it is an important characteristic of the City's territory and lifestyle. Finally, we should recognize the tree in all of its possible roles and physiological functioning, and manage this highly valuable resource with respect for it and the needs of the City.

This policy also seeks to manage and maintain the City's trees for the lowest possible cost, in the short and long term.

In the longer term, we believe that it could be of interest for the City to invite its citizens and other public or private organizations to adopt a similar vision. Here, we could think about schools, among others, that might be interested in planning tree plantings in the flowerbeds around their buildings that have no vegetation.

This would result in raising the green quality of the Beaconsfield territory to an even higher level and finally ensure the perpetuation of its renown as the "Country Town".

In collaboration with the City,

**Document prepared by:**

---

Luc Nadeau  
Forest Engineer Consulting Arborists

*APPENDIX 1*  
***Roles and Functions  
of Trees***



## PLANTS HAVE VALUE<sup>4</sup>

Plants are living things engaged in the most profound creativity in the world. Because of their photosynthetic processes, plants are essential to most other organisms. Their beauty, interaction with other organisms, and spiritual contributions are important to humans, but these attributes are difficult to quantify economically. Whether they occur naturally or have been introduced, trees and landscape plants perform basic engineering, architectural, and environmental functions (see Figure 1.1). Most human interest in plants becomes tangible and quantifiable when viewed in terms of these functional benefits. (...)

Not only do trees and plants contribute monetarily to the value of the property, they also contribute to a higher quality of life and benefit society. There has been an increased awareness in the restorative value of plants in hospitals, homes for the aged, and senior centers. In such places, many “healing gardens” are being constructed for clients, staff, and visitors. Urban forests help build stronger communities and, in doing so, they contribute to lower levels of domestic violence (Sullivan and Kuo 1996). From the medical perspective, researchers have documented that people who interact with plants recover more quickly from everyday stress and mental fatigue (Relf 1996). Another social researcher found that the strongest indicator of local residential satisfaction was the ease of access to nature. They also found that accessibility to nature was the most important factor—after the marital role—in life satisfaction (Relf 1996). Even corporate America is now including landscape considerations in its philosophy. When asked why they have emphasized landscaping, business owners cite the numerous positive aspects of trees and plants (Relf 1996). Landscaping in the work environment

- increases employee productivity, morale, and pride in the workplace
- helps recruit new employees
- attracts customers or new business tenants
- can be used as an employee benefit
- has a role in creating a corporate image
- has value as a marketing tool

Dwyer et al. (1992) state that “urban and community forests can strongly influence the physical/biological environment and mitigate many impacts of urban development by moderating climate, conserving energy, using carbon dioxide and water, improving air quality, controlling rainfall runoff and flooding, lowering noise levels, harboring wildlife, and enhancing the attractiveness of cities.”

Trees contribute to energy conservation because they help reduce the cost of heating and cooling buildings (see Figure 1.1). “Summertime air temperatures in cities can be as much as 10°F warmer than in surrounding rural areas due to the replacement of soil and vegetation with concrete, asphalt, and metal” (Akbari et al. 1992). McPherson and Rowntree’s monitoring and computer simulations suggest that a single 25-ft (7.6 m) tree can reduce the heating and cooling

---

<sup>4</sup> EXTRACT FROM (text and figure) : Guide for Plant Appraisal (9<sup>th</sup> Edition), International Society of Arboriculture, 2000, pp. 1-7.

costs of a typical residence by 8 to 10 percent, or \$10 to \$25<sup>5</sup> per year (McPherson and Rowntree 1993). Even though these numbers do not seem impressive for average-sized residences, commercial properties enjoy large cost savings. Heisler (1986) estimates that windbreaks can reduce a typical home's space-heating demand by 5 to 15 percent. Annual space-heating and cooling savings from a single 25-ft deciduous tree optimally sited near a well-insulated building are estimated to range nationally<sup>6</sup> from \$5 to \$50, up to 20 percent." Simpson (1998) evaluated the regional magnitude of an urban forest's heating and cooling effects in his Sacramento County case study and found "annual cooling savings of approximately 157 GWh (\$18.5 million) per year, 12 percent of total air conditioning in the county."

Carbon sequestration is another measurable benefit of trees, important because increased greenhouse gases in the atmosphere have been linked with global climate change. Studies in Sacramento County, California, showed that "in net, the urban forest removes approximately 3.3 tons per ac (1.2 t/ha) each year, with an implied value of \$3.3 million (\$0.55 per tree). Carbon dioxide reduction by Sacramento's urban forest offsets the total amount emitted as a byproduct of human consumption by 1.8 percent" (McPherson 1998). In the American Forestry Association's *Shading Our Cities*, Sampson states, "A fast-growing forest tree absorbs up to 48 pounds of carbon dioxide a year; that adds up to ten tons per acre of trees—enough to offset the carbon dioxide produced by driving a car 21,000 miles" (1989, p. 10).

Other air-quality studies show major amounts of air pollutant (particulate) uptake by trees (Scott et al. 1998) and include the mitigating effect of their rainfall interception. It seems that, as time goes on, more measurable studies are proving the direct value of trees in everyday life. (...)

---

<sup>5</sup> U.S. Currency.

<sup>6</sup> United States.

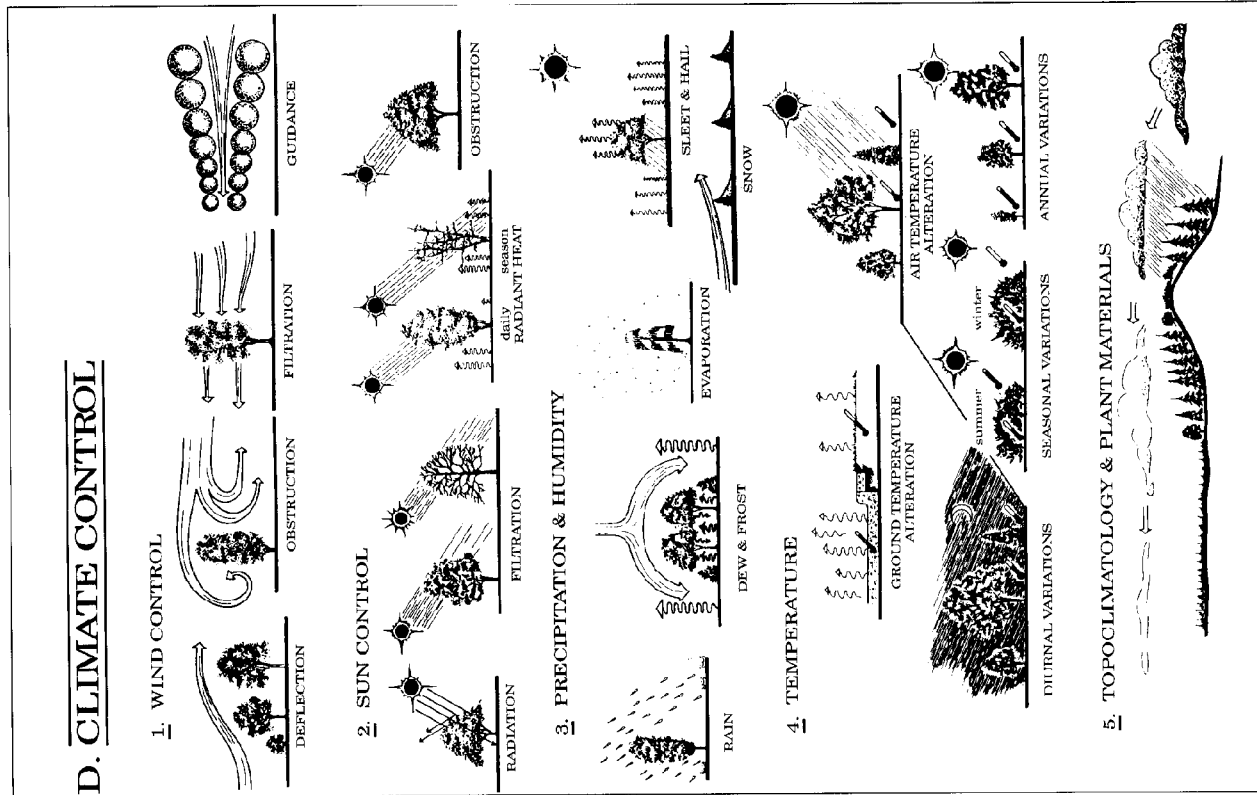
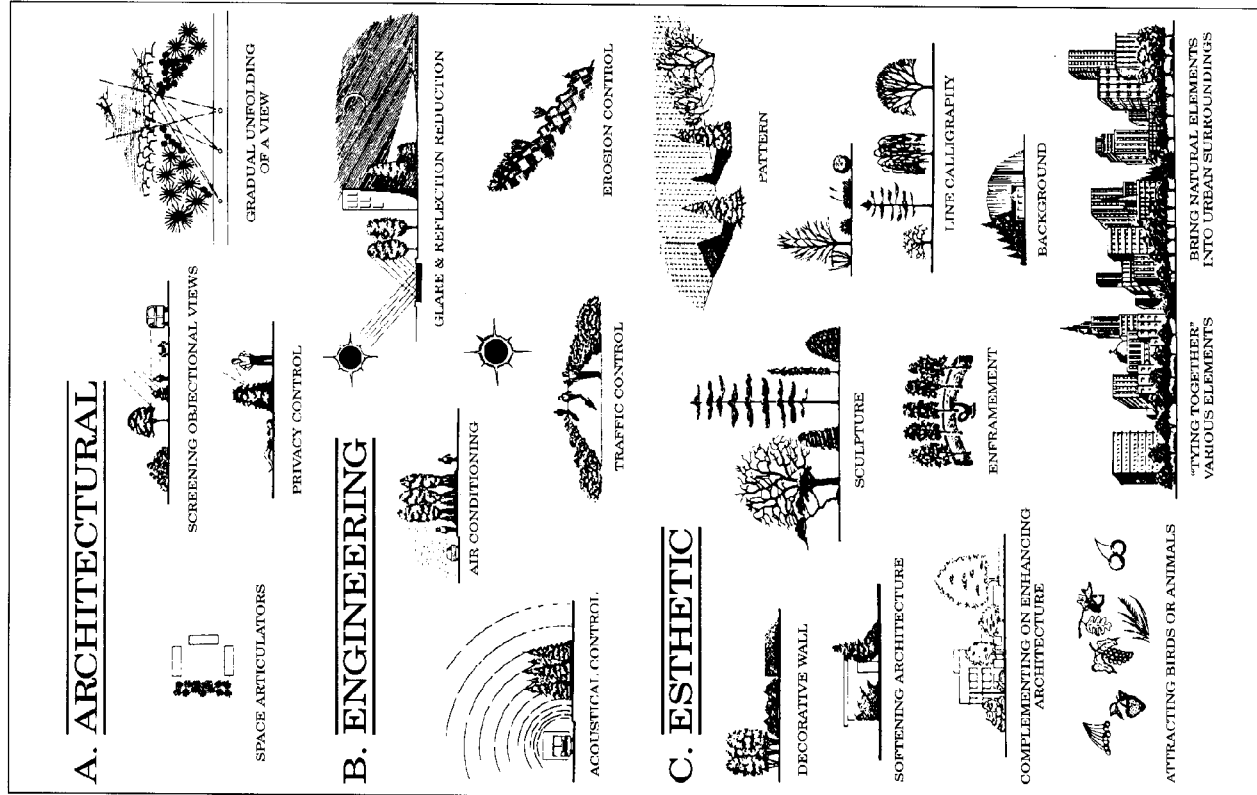


FIGURE 1.1. Functional uses of plant materials (Robinette 1968).

*APPENDIX 2*  
**List of Species  
for Plantings**

**LIST OF SPECIES FOR PLANTING**

Species		Type of site					Notes
Scientific Name	Common Name	Residential Streets	Urban Boulevards	Parks and Blocks of Land	Natural Green Spaces (streams, woods, etc.)	Natural Screens (highways, railroad track)	
<i>Acer ginnala</i>	Amur maple		x				
<i>Acer pennsylvanicum</i>	Striped maple				x		Attracts birds
<i>Acer platanoides</i>	Norway maple	x					
<i>Acer platanoides</i> 'Crimson King'	Crimson King Norway maple	x					
<i>Acer platanoides</i> 'Royal Red'	Royal Red Norway maple	x					
<i>Acer platanoides</i> 'Schwedleri'	Schwedler Norway maple	x					
<i>Acer platanoides</i> 'Summershade'	Summershade Norway maple	x					
<i>Acer rubrum</i> (et cultivars)	Red maple (and cultivars)	x		x	x		
<i>Acer saccharinum</i> (et cultivars)	Silver maple (and cultivars)	x		x	x		
<i>Acer saccharum</i>	Sugar maple			x	x		
<i>Amelanchier canadensis</i>	Downy serviceberry	x	x	x	x	x	Attracts birds
<i>Amelanchier laevis</i>	Smooth serviceberry	x		x	x	x	Attracts birds
<i>Betula alleghaniensis</i>	Yellow birch				x		
<i>Betula populifolia</i>	Gray birch			x	x	x	
<i>Carpinus caroliniana</i>	Blue-beech				x		
<i>Carya cordiformis</i>	Bitternut hickory			x	x		
<i>Carya ovata</i>	Shagbark hickory			x	x		Riverside environment
<i>Celtis occidentalis</i>	Hackberry	x	x	x	x	x	
<i>Cornus alternifolia</i>	Alternate-leaf dogwood			x	x		Attracts birds
<i>Crataegus crus-gallii</i>	Cockspur hawthorn		x	x	x	x	Tree with thorns that could cause injuries
<i>Crataegus mollis</i>	Downy hawthorn			x	x	x	Tree with thorns that could cause injuries
<i>Elaeagnus angustifolia</i>	Russian-olive					x	Tree with thorns that could cause injuries
<i>Fagus grandifolia</i>	American beech			x	x		
<i>Fraxinus americana</i> (et cultivars)	White ash (and cultivars)	x		x	x		
<i>Fraxinus nigra</i> (et cultivars)	Black ash (and cultivars)	x		x	x		
<i>Fraxinus pennsylvanica</i> (et cultiv.)	Green ash (and cultivars)	x	x	x	x	x	
<i>Gleditsia triacanthos inermis</i>	Honey-locust	x	x	x			
<i>Gleditsia triacant.</i> 'Shademaster'	Shademaster honey-locust	x	x	x			
<i>Juglans cinerea</i>	Butternut			x	x		

## LIST OF SPECIES FOR PLANTING (CONT'D)

Species		Type of Site					Notes
Scientific Name	Common Name	Residential Streets	Urban Boulevards	Parks and Blocks of Land	Natural Green Spaces (streams, woods, etc.)	Natural Screens (highways, railroad track)	
<i>Larix laricina</i>	Tamarack			x			
<i>Malus baccata</i> (et cultivars)	Crab apple (and cultivars)	x	x	x			
<i>Malus spp.</i>	Apple (native wild species)				x		
<i>Ostrya virginiana</i>	Ironwood	x	x	x	x	x	
<i>Picea glauca</i>	White spruce			x			
<i>Picea pungens glauca</i>	Colorado blue spruce			x			High salt spraying areas
<i>Pinus nigra austriaca</i>	Austrian pine			x			High salt spraying areas
<i>Pinus resinosa</i>	Red pine			x			
<i>Pinus strobus</i>	Eastern white pine			x			
<i>Populus balsamifera</i>	Balsam poplar				x		Plant far from intrastuctures (roots)
<i>Populus deltoides</i>	Eastern cottonwood			x	x	x	Plant far from intrastuctures (roots)
<i>Prunus pennsylvanica</i>	Pin cherry			x	x	x	Attracts birds
<i>Prunus virginiana</i>	Choke cherry			x	x	x	Attracts birds
<i>Prunus virginiana 'Shubert'</i>	Shubert choke cherry		x				
<i>Quercus bicolor</i>	Swamp white oak				x		Riverside environment
<i>Quercus coccinea</i>	Scarlet oak	x		x			
<i>Quercus macrocarpa</i>	Bur oak	x		x	x		
<i>Quercus rubra</i>	Red oak	x		x	x		
<i>Rhus typhina</i>	Staghorn sumac				x	x	Attracts birds
<i>Robinia pseudoacacia</i>	Black locust			x	x	x	Tree with thorns that could cause injuries
<i>Salix alba var. Tristis</i>	Golden weeping willow				x		Riverside environment
<i>Salix nigra</i>	Black willow			x	x		Riverside environment
<i>Sorbus decora</i>	Showy mountain-ash				x		Attracts birds
<i>Syringa reticulata 'Ivory Silk'</i>	Ivory Silk Japanese tree lilac		x				
<i>Thuja occidentalis</i>	Eastern white-cedar			x			Shelter for birds
<i>Tilia americana</i>	Basswood	x		x	x		
<i>Tsuga canadensis</i>	Eastern hemlock			x			
<i>Ulmus americana</i>	American elm			x	x	x	
<i>Ulmus rubra</i>	Slippery elm				x	x	
<i>Viburnum lentago</i>	Sweet viburnum			x	x	x	Attracts birds