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Report To:	General Government Committee		
Date of Meeting:	September 4, 2018		
Report Number:	ENG-018-18	**Resolution:**	GG-390-18, GG-391-18
File Number:		**By-law Number:**	
Report Subject:	**Clarington Urban Forest Strategy**		

Recommendations:

1. That Report ENG-018-18 be received; and

2. That Council endorse the Clarington Urban Forest Strategy attached to Report ENG-018-18.

Report Overview

The purpose of this report is to provide Council with an Urban Forest Strategy that provides broad direction for urban forest planning and makes forest sustainability the primary objective of forest management. This report seeks endorsement from Council for the strategic objectives recommended in the Urban Forest Strategy.

1. Background

1.1. At the January 15, 2018 Council Meeting, Council passed Resolution #GG-028-18, directing an inter-departmental team including Operations, Planning and Engineering to develop an Urban Forest Strategy using existing staff.

1.2. Earlier reports on Clarington's existing policies regarding tree preservation were submitted by the Operations Department (OPD-011-17), the Clerk's Department (CLD-013-2016), and also the Planning Services Department (PSD-055-16). Those reports outlined how tree protection is currently addressed by the applicable legislation and regulations for the rural and urban areas of Clarington.

2. Discussion

2.1 Given the direction of Council, staff have prepared the attached Urban Forest Strategy including Strategic Objectives to move the urban forest towards a long-term, sustainable model of management. The Strategic Objectives are categorized under the following six groups:

- Tree Inventory and Assessment;
- Management of Municipal Forests;
- Level of Service;
- Customer Service / Service Delivery;
- Tree Protection and Management; and
- Forest Health and Pest Management.

2.2 The value of trees in urban settings is well-documented, and includes important environmental, economic and community benefits. Trees and shrubs have the capacity to clean the air and water, moderate the local climate, reduce energy consumption in homes and buildings, sequester and store atmospheric carbon, provide shade and screening, help control storm water runoff, and provide habitat for wildlife. Trees also provide community and economic benefits. These include contributing to mental and physical health, and increasing property values.

2.3 An Urban Forest Strategy is a framework that sets broad direction for urban forest planning and makes forest sustainability the primary objective of forest management. It provides the strategic direction for the long-term management of the Urban Forest and is an integral part of addressing climate change.

2.4 Achieving long-term forest sustainability can be far more complex in urban areas than in the natural environment due to variations in land use, ownership, growing conditions, and competing social and economic interests.

2.5 The Urban Forest Strategy can be used to direct the creation of an *Urban Forest Management Plan* that would:

i. Set goals and objectives for the long term sustainability of the urban forest;
ii. Set measurable targets for success; and
iii. Project resource requirements to meet goals.

2.6 When the provisions of Bill 68 Modernizing *Ontario's Municipal Legislation Act, 2017*, come into force on March 1, 2019, the Municipality is required to establish a policy on "the manner in which the Municipality will protect and enhance the tree canopy and natural vegetation in the municipality". If approved, we assume the Urban Forest Strategy will satisfy the legislative requirement as no guidance or direction has been provided by the Ministry of Municipal Affairs and Housing.

2.7 Staff will work towards the creation of an Urban Forest Management Plan as additional information and resources become available. At a minimum, Operations Department will budget for an update to the street tree inventory. The Urban Forest Strategy should be reviewed on a 5 year basis.

3. Concurrence

3.1. This report was reviewed by the Municipal Clerk, Director of Planning Services and Director of Operations who concur with the recommendations.

4. Conclusion

4.1. In accordance with Council's direction, staff have developed the Clarington Urban Forest Strategy, a framework that sets broad direction for urban forest planning and makes forest sustainability the primary objective of forest management. The Urban Forest Strategy identifies what we aim to achieve and recommends actions to achieve those objectives. Some objectives can be achieved with existing staff resources, others would require specific professional expertise to determine the staff and financial resources needed to implement the objectives.

5. Strategic Plan Application

5.1. The recommendations contained in this report conform to Priority 6 of the 2015 - 2018 Strategic Plan initiative to "Enhance Access to Our Unique Natural Environment".

Submitted by: _____ Reviewed by: _____

Anthony Cannella,
Director of Engineering Services

Andrew C. Allison, B. Comm, LL.B
CAO

Staff Contact: Peter Windolf, Manager of Park Development, pwindolf@clarington.net

Attachment 1 – Urban Forest Strategy

There are no interested parties to be notified of Council's decision.

Clarington

Urban Forest Strategy

Woodland at Bons Park-Bowmanville

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List of Appendices

1. INTRODUCTION

The Urban Forest has generally been defined as trees, forests, greenspace and related cultural components in cities and communities. The Urban Forest is defined in the Official Plan as meaning "a system of plant and animal communities, or as the woody and associated vegetation in and around human settlement areas. It includes street trees, residential trees, park trees and greenbelt and ravine plant and animal communities, and provides habitat for a diversity of urban wildlife". Urban Forestry is generally defined as the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic and aesthetic benefits trees provide society.

An Urban Forest Strategy is a framework that sets broad direction for urban forest planning and makes forest sustainability the primary objective of forest management. It provides the strategic direction for the long-term management of the Urban Forest and is an integral part of addressing climate change. Achieving long-term forest sustainability can be far more complex in urban areas than in the natural environment due to variations in land use, ownership, growing conditions, and competing social and economic interests.

Why is it called an "Urban Forest"?

Erik Jorgesen, Canada's first urban forester, defined the term in 1967 as: "A specialized branch of forestry that has as its objectives the cultivation and management of trees for their present and potential contribution to the physiological, sociological and economic well-being of urban society. These contributions include the over-all ameliorating effect of trees on their environment, as well as their recreational and general amenity value."

It is understood that trees in urban areas (particularly those outside of natural areas) do not provide the same range of ecological functions as large tracts of natural forests, or the same economic functions as actively managed plantations. However, trees in urban areas do provide a broad range of functions and are most effectively considered, and managed, as a whole. Therefore, the term "urban forest" is used to capture all the trees within a given urban area.

The Strategy can be used to direct the creation of an *Urban Forest Management Plan* that would:

i. Provide specific implementation direction on all aspects of the urban forest strategy;
ii. Set goals and objectives for the long term sustainability of the urban forest;
iii. Set measurable targets for success.
iv. Project resource requirements to meet goals.

The Urban Forest provides a variety of social, environmental and economic benefits to the citizens of Clarington. These benefits are well researched and relate to a variety of measurable indicators of urban forest health. Incorporating a values based approach to managing the Urban Forest is the basis for the Urban Forest Strategy.

When enacted on March 1, 2019, the provisions of Bill 68 to Modernize Ontario's Municipal Legislation Act, 2017, will require the Municipality to establish a policy on "the manner in which the Municipality will protect and enhance the tree canopy and natural vegetation in the municipality". Amendment 107 to Clarington's Official Plan updated the policies regarding the natural heritage system and included enabling polices for the development of an Urban Forest Management Plan.

Forest Management means the management of woodlands in a sustainable manner which may include the construction and maintenance of forest access roads, production of wood and wood products, and maple syrup production facilities; in addition forest management includes the provision of recreation opportunities. The large forests within the municipal boundaries, such as Ganaraska Forest, Long Sault Forest, Kendal and Orono Crown Lands and Darlington Provincial Park have management plans prepared by their respective owners/managers.

This Urban Forest Strategy provides some contextual information regarding the entire Municipality, the strategic objectives are focused only on its urban areas as defined in the Official Plan (Figure 1).

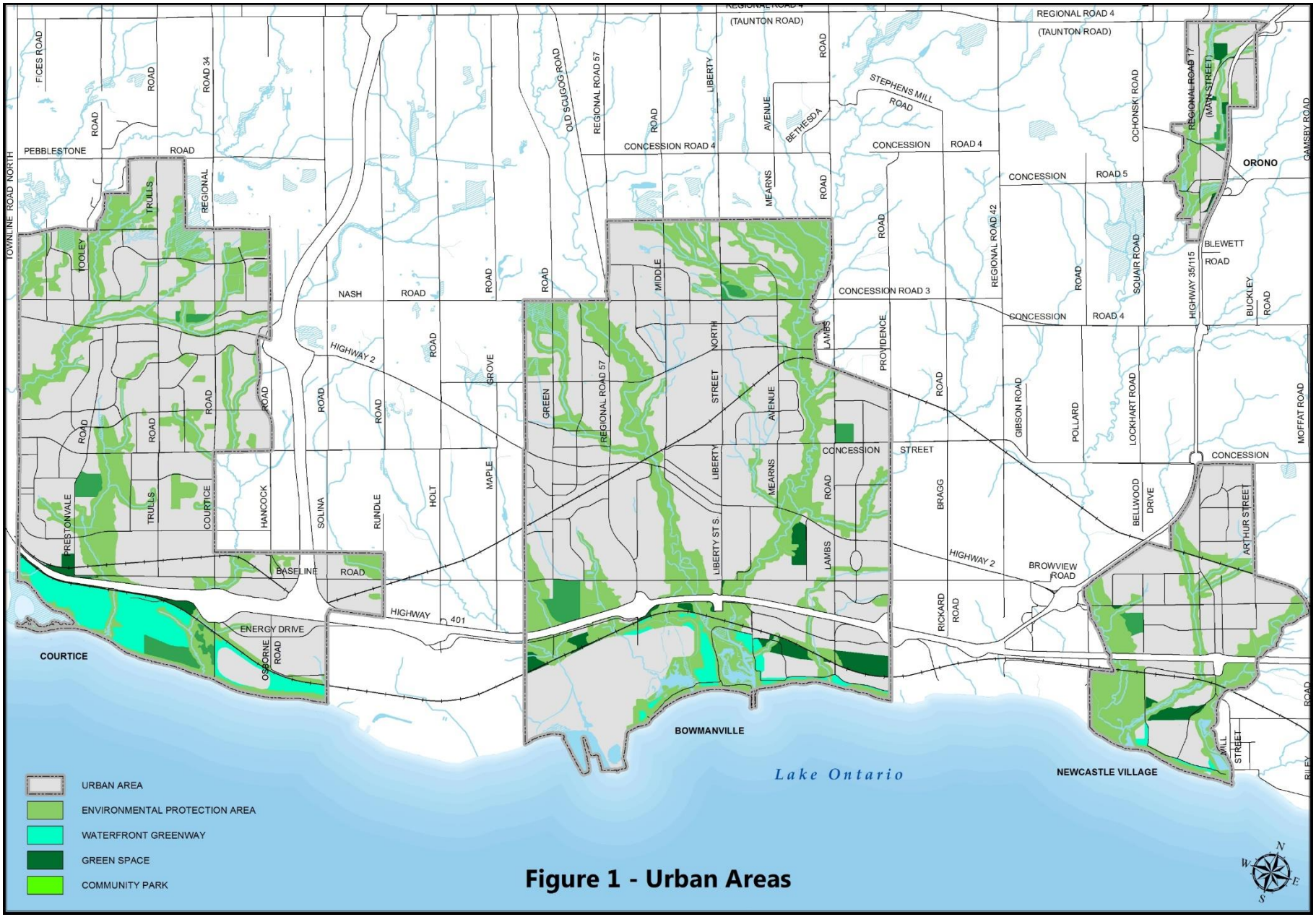

Figure 1 Map showing Urban Areas in Clarington

2. CURRENT FOREST CONDITION

The current forest condition or status of forest resources (including street trees, parks and open space trees, public woodlands in parks and environmental protection areas as well as all trees on private land within our urban areas is the basis for all short and long term decision making for Clarington's urban forest. The most recent base information on forested areas (both private and public) was compiled for the Official Plan Natural Heritage Discussion Paper in 2013. Generally the makeup of the forest communities is discerned using the Ecological Land Classification (ELC) protocol which classifies vegetation communities through air photography interpretation; little detailed information exists on species composition, age class or condition. More in depth ground surveys have been carried out on the large forest tracks by their managers (e.g. the Conservation Authorities and Ministry of Natural Resources). The only detailed on-the-ground inventory for urban areas has been the street tree inventory completed in 2012. This section describes the general information on the current forest inventory.

2.1 Forested Areas

The Municipality of Clarington covers 61,350 hectares. The total mapped forested areas on both private and public land is 17,975 hectares, or 29.3% of the total land area when Forest and Forest Swamp areas are combined (Figure 2).

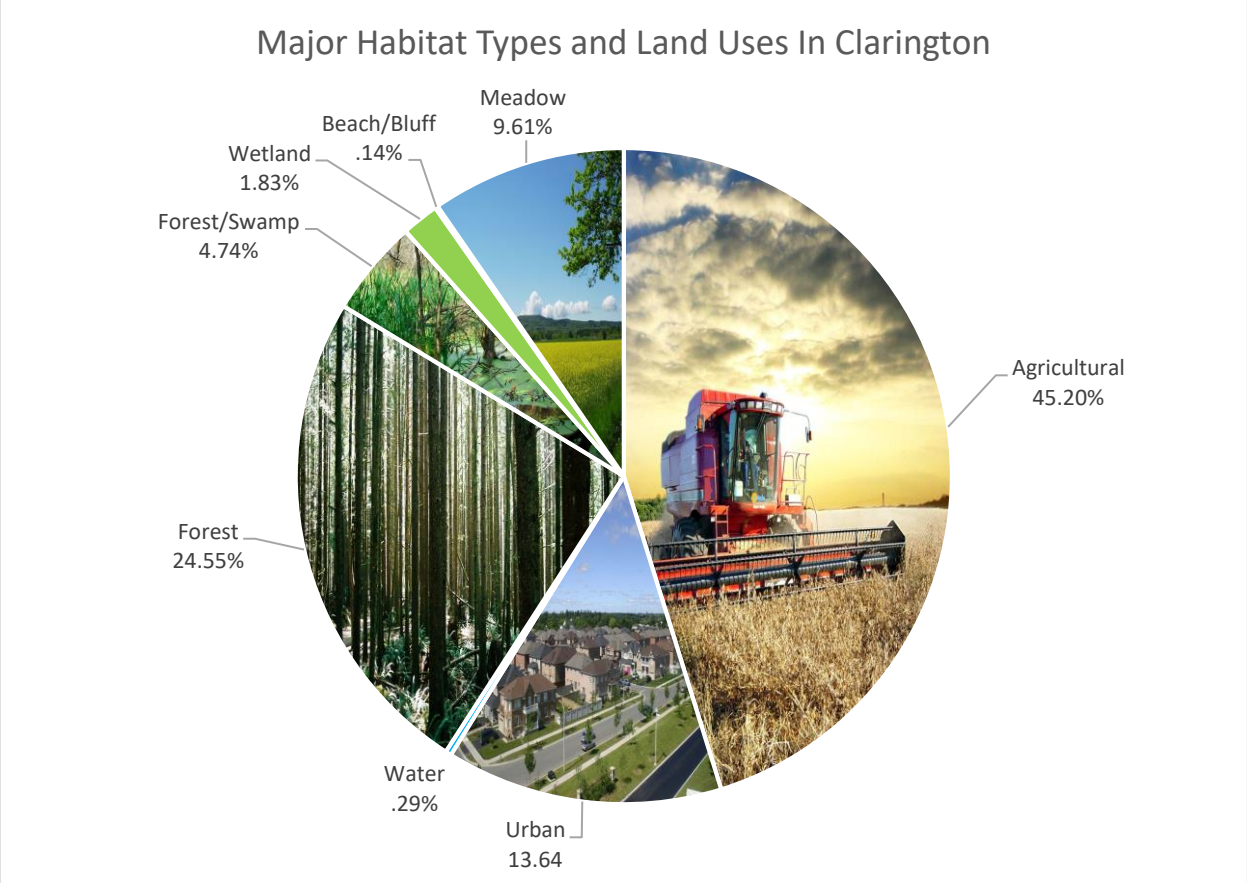

Figure 2 Percent cover of Clarington major habitat types and land uses

The Natural Heritage System Discussion Paper overview of natural heritage conditions from April 2013 (Appendix A) describes the 29.3% cover figure as very slightly below the 30 percent forest cover guideline recommended as a minimum by Environment Canada. The forest cover figure for Clarington suggests that to even meet what biologists have considered as a very conservative minimum all remaining forest should be maintained and there should be an increase in cover to improve ecological health and function in the landscape.

Although there are some very large forest patches in the Oak Ridges Moraine many of the remaining woodlands in Clarington are small and isolated, especially those in urban areas. Furthermore, given that many are found in valleys and stream corridors, the shape of patches is often linear or convoluted, reducing the amount of forest interior.

The distribution of forest cover in Clarington is skewed towards the more rural north end of the Municipality on the Oak Ridges Moraine. Although this has the benefit of helping water retention and maintaining the health of stream headwaters, the lower amount of cover in the southern portion of the Municipality results in poor connectivity and lower capacity to support wildlife populations. Furthermore urban impacts contribute to higher negative impacts on the remaining woodlands, which are already compromised due to their size and shape.

The Municipality does not have detailed forest inventory data for the majority of our forested areas.

2.2 Individual Trees

The Municipality does not have comprehensive data on the number of individual trees that exist in the urban areas on either public or private land. We know that there are approximately 21,000 street trees as of 2018 but no data has been collected on the number of individual trees in our parks, cemeteries and open space areas.

2.3 Street Tree Inventory (Courtice, Bowmanville, Newcastle, Orono)

The most recent street tree inventory was completed in 2012. Since then the inventory has grown from approximately 18,000 trees to over 21,000 trees as a result of new subdivision development. Due to the new subdivision growth over a relatively short period of time, the inventory of street trees is unbalanced, with most of our street trees being relatively young in age.

Maple is the predominant street tree (44%), with Lindens (14%) being the next most common genus of street tree (Figure 2). In 2012 Ash represented 13.5% of Clarington street trees but the effects of Emerald Ash Borer have drastically reduced their numbers and ash are no longer planted on Clarington streets.

Over the last decade several over-planted species have been reduced in proportions through the increased planting of other varieties, and designing streetscape plans for new subdivisions with a greater mix of species. Invasive trees like Norway Maple are no longer planted as street trees in new subdivisions.

The municipal street tree inventory requires continual updates and maintenance, as well as inspection of trees that have not had work completed on within the last 7 years.

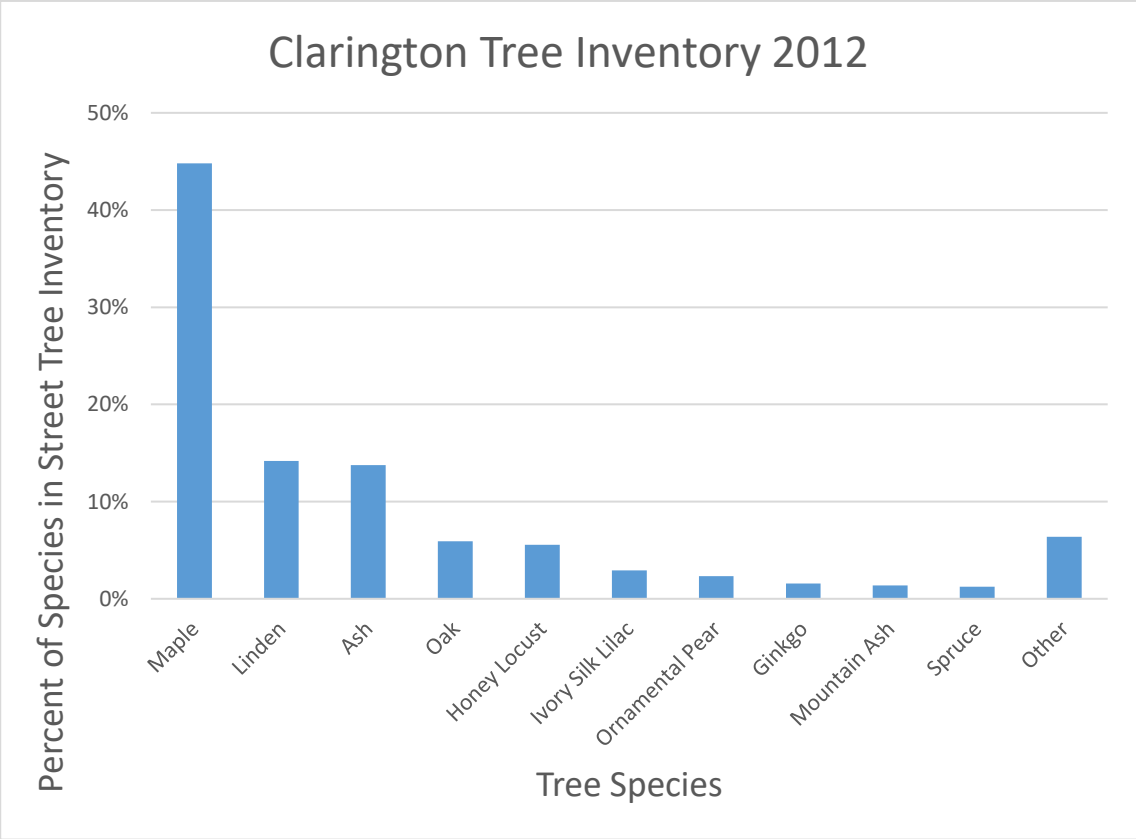

Figure 3. Percentage of Tree Species in street tree inventory

Figure 4. Species size classes of street trees categorized by maximum biological size

2.4 Tree Planting Programs

Clarington Operations Department has an annual street tree replacement program that is contracted out. The intent of the program is to remove and replace dead street trees in assumed subdivisions. Funding for this program has increased slightly in-line with increases in contractor costs.

The effects of Emerald Ash Borer have resulted in the removal of 1544 street trees over the past 5 years from municipal boulevards with another 800 ash trees scheduled to be removed and replaced over the next 2 years. Staff currently do not have an inventory of the number or size of ash trees that are located within municipal woodlands, parks or rural raodways that still need to be addresssed.

Over the past 5 years approximately 4500 trees have been planted on municipal properties as part of community planting programs implemented with funding from outside sources such as Highway of Hero's Tribute Program, Evergreen, The Carbon Farmer, OPG/Scouts Canada, and others. These planting programs have resulted in a significant increase in tree planting over the last decade on streets and in parks, which will result in many long term benefits.

From 2012-2018 the Trees for Rural Roads program has resulted in the planting of 5,000 trees along rural roads. A 2018 Study conducted by the EcoBusiness Network determined that approximately 165 tonnes of carbon dioxide equivalents have been diverted by the Trees for Rural Roads program for the 5 years (2012 to 2017).

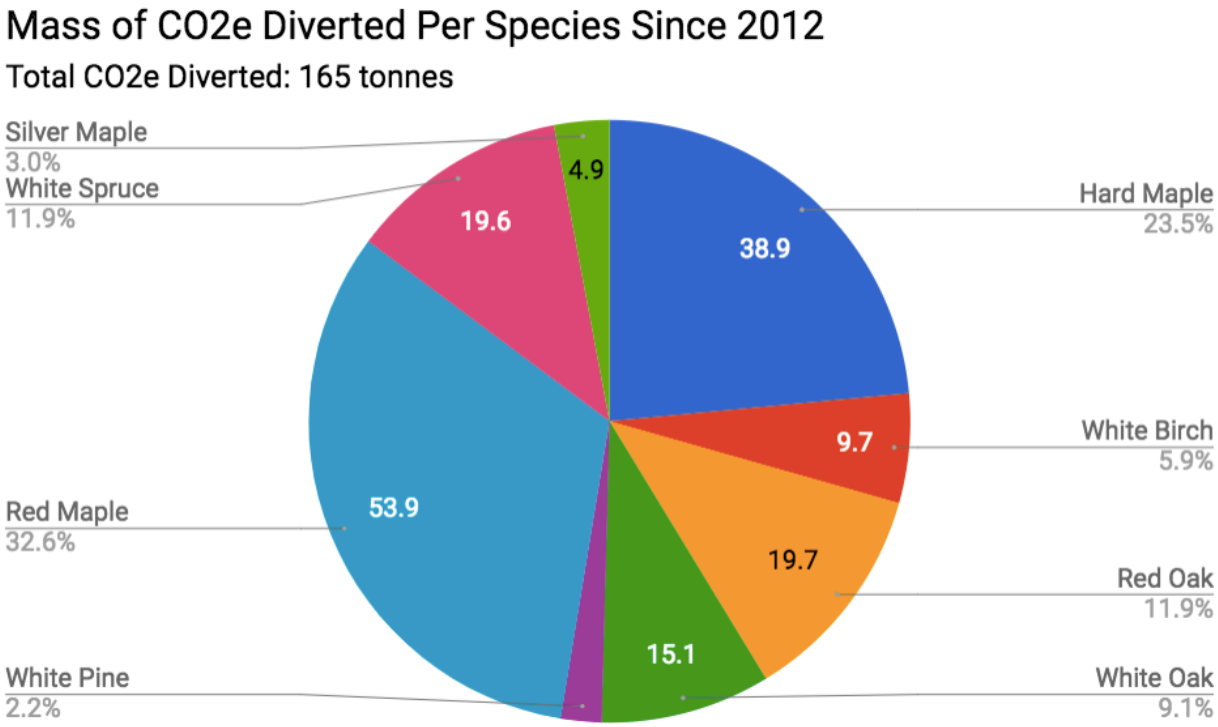

Figure 5. Mass of CO2 Diverted Per Species Since 2012

2.5 Tree Maintenance Program

Forestry staff in the Operations Department are responsible for the maintenance of trees on streets, parks and open space areas. The Operations Department is currently staffed with three full-time employees that are responsible for forestry duties. These staff consist of a certified arborist/lead hand and two light equipment operators. During the winter months these staff are also fully engaged with winter control activities. For the summer months the forestry crew is typically supplemented by three students. Common maintenance issues include, removal of dead trees, tree pruning, and stump removal. The number of forestry work orders from 2015-2018 are as follows;

- **2015**-935 work orders
- **2016**-1047 work orders
- **2017**-1175 work orders
- **2018** (to date)-942 work orders

The number of work orders will continue to increase as existing trees age and additional subdivisions are developed adding to the tree inventory on streets, parks and open space areas.

The International Society of Arboriculture Ontario (ISAO) recommends minimum and "Best Management Practices" for annual tree inspection and maintenance pruning for street trees. The Best Management Practices (BMP) recommends a tree be inspected on a timeline based on its current age and condition (ranging from once every 1 (over mature trees) to every 7 years (tree in the middle of its lifespan). ISAO also recommends a 7 year (BMP) to 10 year (minimum) pruning cycle (prune the tree every 7 to 10 years) for street trees. This pruning cycle will result in healthier, more structurally sound and longer lived street trees. If the average lifespan of a street tree can be increased by even 10 years, it would reduce the annual tree planting program costs by approximately 20% and ongoing maintenance significantly reduces the number of service requests made each year. In addition, a more structurally sound tree is less likely to be damaged in a storm, or cause damage to municipal and private property (decreasing Municipal liability).

2.6 Benefits of Trees

Trees are a vital component of the urban landscape. They provide many important roles within the Municipality of Clarington, including:

- Water conservation;
- Energy conservation;
    - Reducing summer air temperature by providing shade
    - Reducing cold winter winds by acting as a wind break
- Economic benefits;
    - Increasing tourism values
    - Increasing property values
    - Increasing community profile
- Improving community health;
    - Reducing air pollution
    - Reducing harmful ultra-violet light exposure
    - Reducing greenhouse gases
    - Reducing soil erosion;
- Providing wildlife habitat; and
- Increasing the beauty of the urban landscape.

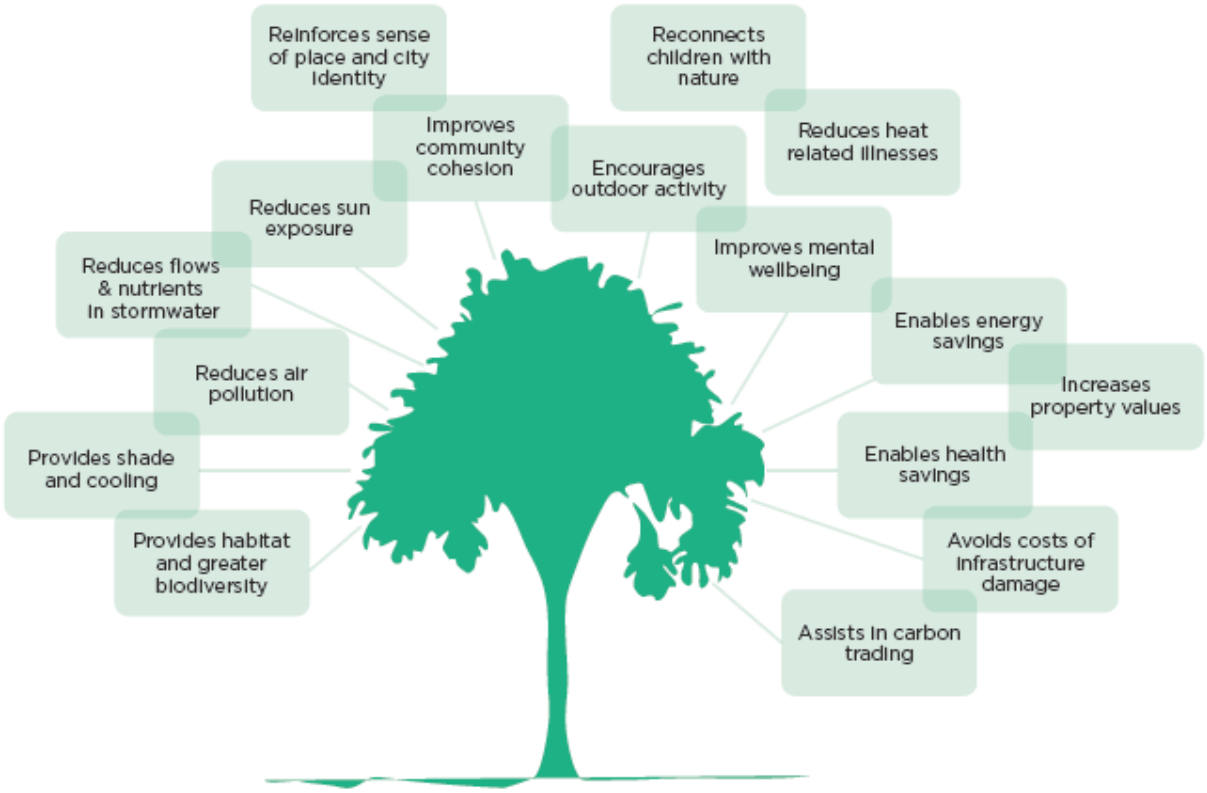

Figure 6. Overview of the benefits provided by urban forests.

2.7 Current Forest and Tree Protection processes in Clarington

There are many pieces of legislation and processes that govern forest and tree preservation. There is Provincial legislation, Environmental Assessments, *Planning Act* Applications, and Environmental Impact Studies in addition to the Durham Region Tree By-law and Clarington's Tree By-law. To fully understand tree preservation, provincial legislation must be considered collectively with Clarington's and Durham's Tree By-law. Below is a brief outline of the many regulations that affect protection or cutting of trees and woodlands. A number of pieces of legislation have been introduced or amended since Clarington's Tree By-law was enacted in 1997.

2.7.1 Municipal Tree By-laws

The *Municipal Act, 2001* grants the authority to upper and lower tier municipalities to enact a by-law to prohibit or regulate the destruction or injuring of trees and requires the municipality to have regard to good forestry practices as defined in the *Forestry Act*. An upper tier municipality's authority governs woodlands as defined in the *Forestry Act* that are one hectare or more in area. The *Municipal Act, 2001* further provides that the local

municipality may not prohibit or regulate the destruction of trees in any woodlands designated in the upper-tier by-law.

2.7.2 Durham Region Tree By-law

The Durham Region Trees By-law came into force on June 27, 2012, replacing an earlier by-law. The Regional Tree By-Law reflects the Region's commitment to protect forested areas and the natural environment. Through this by-law, Regional Council recognizes that woodlands contribute to ecosystem health, human health, and our overall quality of life.

The Regional Tree By-law applies to woodlands within the Region that are 1 hectare (2.5 acres) in size and greater. It does not apply to areas less than one hectare.

2.7.3 Clarington Tree By-law

Clarington's Tree By-law 97-35 is twenty years old and applies to woodlands having an area equal to 0.2 hectare or greater but less than 1 hectare south of Taunton Road. The upper tier (Durham Region) Tree By-law applies to areas in excess of 1 hectare. Clarington's size restriction was set in 1997 when the By-law was enacted. The recommendation from staff had been 0.4 ha and Council reduced the size to 0.2 ha, presumably at the request of delegations. The By-law's purpose was to protect woodlands and not individual trees.

Clarington's Tree By-law regulates woodlands between 0.2 ha and 1 ha in size; it does not regulate individual trees. To reduce to an area under the 0.2 hectare or half an acre size would render the By-law extremely cumbersome and require significant resources to enforce.

2.7.4 Conservation Authority

There are some natural heritage features such as significant wetlands and significant coastal wetlands where development and site alteration are not permitted. Typically these policies are enforced by Conservation Authorities in concert with the local Ministry of Natural Resources staff. In addition, the Conservation Authorities administer Ontario's Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses.

2.7.5 Environmental Assessments

Where a project has been approved by the Ministry of Environment and Climate Change under the *Environmental Assessment Act,* the project can proceed as set out in the Environmental Study Report, subject to the conditions imposed by the approval. Therefore, projects such as the construction of Highway 407 and Highway 418, widening

of Highway 401, and the Clarington Transformer Station, which have proceeded under their *Environmental Assessment Act* approvals, are not subject to a municipal tree by-law.

2.7.6 Planning Act

For projects proceeding under a *Planning Act* application there is a rigorous process for the determination of natural heritage area protection and tree preservation. An applicant attends a pre-consultation meeting where the need for various studies including Environmental Impact Studies (EIS), are set out. A tree preservation plan is often a requirement for a complete application; it is prepared in accordance with the EIS. Environmental Impact Studies are a requirement used for all types of development applications where the natural heritage system may be impacted. The natural heritage system includes wetlands, woodlands, valley lands, and the Natural Core and Linkage areas of the Oak Ridges Moraine (as set out in the Official Plan).

Clarington has good policies in our Official Plan to protect and enhance the natural heritage system and its ecological integrity. The 1996 Official Plan established a new standard for the protection of natural heritage features in Southern Ontario. The recently amended Official Plan policies continue to protect Clarington's natural heritage system from incompatible development. However, Official Plan policies have no "regulatory" teeth – that is there is no mechanism to enforce compliance without the other municipal regulatory mechanisms being in place

2.7.8 Environmental Impact Studies

The Environmental Impact Studies that are prepared are reviewed by Conservation Authority staff to determine the limits of protection which are then enforced through the development agreement. Tree Preservation Plans are reviewed by Engineering Services and approved by the Director. The Municipality also has the ability to require a Peer Review of the Tree Preservation Plan where warranted.

2.7.9 Woodlands in Clarington.

Currently, there are some 1200 wooded areas between 0.2 and 1 hectare in Clarington to which the by-law could apply (if the Tree By-law were amended to cover all of Clarington, rather than just south of Taunton Road). However, many of these are hedgerows in agricultural areas. The removal of hedgerows can be part of Normal Farm Practices, and would be exempt from the Clarington Tree By-law.

To obtain a more accurate count of affected woodlands, staff isolated lands zoned agriculture (a total of 935), which reduced the number of woodlands to 265. The woodlands in valleylands or wetlands that are regulated by the Conservation Authorities

were isolated from the count as well; leaving 94 woodlands between 0.2 and 1 ha that the Municipality has jurisdiction over. Seven of these are in urban areas.

The 7 woodlands between 0.2 and 1 ha within urban areas, where the Municipality would have jurisdiction, would also be subject to *Planning Act* application processes. Some urban woodlands could be in jeopardy if an owner began to clear them, prior to an application.

2.7.10 Compensation Plans

Clarington in concert with Durham Region and Conservation Authority staff require compensation plans when woodlands have been cleared. The compensation plans are funded by the land owner responsible for the destruction of the woodlands. Our policies with regard to compensation plans should be better articulated in terms of what triggers the need for compensation, how will it be measured and how will it be enforced.

3. STRATEGIC OBJECTIVES

The Municipality of Clarington's main objective is to manage the urban forest in a long-term, sustainable manner. There are several areas of focus (strategic objectives) that need to be addressed over the short-term to move the urban forest towards a long-term, sustainable model of management. Each of the Strategic Objectives can be categorized under one of the following six groups:

3.1 Tree Inventory and Assessment;
3.2 Management of Municipal Urban Forests;
3.3 Level of Service;
3.4 Customer Service / Service Delivery;
3.5 Tree Protection and Management; and
3.6 Urban Forest Health and Pest Management.

3.1 Tree Inventory and Assessment (Streets, Parks and Open Space Areas)

3.1.1 Tree Inventory and Forest Canopy Assessment

The tree inventory is the basis of all long term planning and decision making for urban forest management. Regular updates to the street tree inventory should continue and resources should be directed to complete an inventory of the individual trees in parks and open space areas.

Staff will investigate partnership opportunities with interest groups, schools, conservation authorities, and private land owners to collect information on the quantity and quality of trees and forests on private land through the use of

satellite imagery, volunteer data collection and other data acquisition opportunities.

3.1.2 Street and Park Tree Diversity Objectives

Diversification of the tree species within parks and on boulevards provides a healthier, more robust tree inventory that is less prone to serious pest issues (i.e. insects and diseases). Staff has been diversifying the street tree inventory over the last decade. The long-term goal is to have all street tree species occupy less than 10% of the overall total tree inventory.

3.1.3 Age Class Distribution Objectives

A diverse age distribution of trees within parks and on boulevards reduces issues of peak year declines due to natural mortality. Due to the large proportion of young trees as a result of subdivision expansion, there will be a future issue with natural mortality and decline as these trees become mature within the same decade. An analysis and future projection of growth, planting and management as part of an *Urban Forest Management Plan* is recommended to identify strategies to develop a more diverse-aged tree inventory over the long-term.

3.2 Management of Municipal Forests

3.2.1 Forest Succession Plans

An *Urban Forest Management Plan* would include objectives and individual forest succession plans for municipal owned forest in parks and open space areas. Specifically, many forested areas, such as valleylands require management to ensure the long-term sustainability of these lands.

Private tree plantings also contribute to the urban forest. In new subdivisions, developers are required to provide new home owners with vouchers for an additional tree beyond the street trees that are planted as part of the public realm.

3.2.2 Non-native invasive species management

Non-native species are becoming more common in natural areas within the Municipality. Dog-strangling vine, garlic mustard, etc. are serious problems that will impact long term sustainability of forested lands. Staff will continue to investigate partnerships, provincial and federal funding opportunities to identify, map and address the problem caused by non-native invasive species.

Staff have been working with Conservation Authority staff and volunteers on invasive species projects including education and eradication. One example is the work by the Courtice EcoProjects on phragmites eradication in the Black, Harmony and Farewell Creek valleyland.

The Ontario Invasive Species Plant Council has a mapping tool on its website that members of the public can use to report an invasive species sighting. In addition they provide educational material and ongoing management workshops, the Municipality has assisted by hosting the workshops jointly with the Conservation Authorities.

3.2.3 Mapping of encroachments and education program for residents

Encroachments by adjacent landowners into municipal forests and valleylands result in the destruction and/or degradation of natural areas. They also act as a point source of non-native invasive species, and can have long-lasting impacts to natural areas. Subdivision developers in Clarington are required to provide education materials to new residents on the impacts of encroachments on the natural environment. . Staff will investigate additional methods of providing information to existing residents who live adjacent to natural areas.

3.3 Level of Service

3.3.1 Inspection Program

A systematic tree inspection program following the International Society of Arboriculture (ISA) standards is a best practice for all tree maintenance programs. Identification of tree issues early with follow-up maintenance can increase the lifespan of a tree, significantly reduce risk of damage caused by tree structural failures, and reduce the long term costs of management of tree inventories. A regular system of inspection and reporting would be developed for municipal street and park trees as part of a comprehensive *Urban Forest Management Plan*.

3.3.2 Maintenance (Pruning) Cycle

Regular pruning of trees increases their health, longevity and significantly reduce risk of damage caused by tree structural failures. It also acts to reduce the number of service requests made by residents to report tree problems that would not exist if the tree had been pruned regularly.

Due to the Emerald Ash Borer infestation starting in 2014 municipal resources have been concentrated on the removal of ash trees and staff are not able to respond to less critical forestry tree requests. Only those forestry requests that are considered an emergency will be performed on a priority basis.

Staff will review the pruning program towards the goal of achieving a regular maintenance cycle of 7-10 years.

3.4 Customer Service / Service Delivery

3.4.1 Response Protocols

Staff will review the current process for receiving service requests through to the completion of the tasks and tracking of work. This process will be reviewed with the goal of reducing the timeline between receiving service requests and final closing of the service request.

3.4.2 Public Education and Information Availability

Increase the opportunities for public education and outreach through community partners, volunteer planting events, and involvement in environmental community events and committees. Educating community partners on the value of native species and the dangers of invasive species could result in less long-term impact on natural areas.

A comprehensive review and update of the Urban Forestry information on the website needs to be completed. Clarington's website and social media could be a good avenue to provide information to the public.

Create public education opportunities on the benefits of protecting and managing trees on private property. Trees on private properties provide benefits to Clarington as a whole without any additional investment from the municipality.

3.5 Tree Protection and Management

3.5.1 Private Tree By-law

In Clarington, as elsewhere in southern Ontario, much of the urban forest is privately-owned. The condition and composition of the privately-owned component of the urban forest is unknown, pest management, risk mitigation and tree removal and planting decisions are outside the direct control of municipal

urban forest managers. Tree by-laws regulating injury to and destruction of trees on private property is one tool that some municipalities in Ontario have implemented to try and ensure that trees considered significant in a municipality are not removed without good reason. However, such by-laws can evoke strong sentiment among some members of the community who feel that their private property rights are being infringed upon.

Private tree by-laws are also tools that require dedicated staff resources to administer and enforce. Issues surrounding private tree protection are more prevalent in municipalities that have a greater percentage of mature urban areas. In Clarington, we have many older established neighbourhoods with significant tree cover, some of which is now reaching an age where it is prone to disease, storm damage and death. But the majority of Clarington's urban forest is in newer residential development areas that have not reached the age where large mature and over mature trees on private properties have become a significant recurring issue.

Staff do not recommended that Clarington introduce a Private Tree By-law at this time. Future updates to the Urban Forest Strategy and Tree By-Laws will reassess the need for a Private Tree By-law as our urban areas mature.

3.5.2 Review Clarington's Tree By-law

Staff will plan regular reviews to the existing Tree By-law on a 5-year cycle to ensure that changes to legislation, organization and relevance are kept up-to-date and compliment the Region's By-law which applies to woodland areas over 1.0 hectare.

3.5.3 Formalize the review process for capital projects with tree impacts.

Staff will review the process in place for capital projects and recommend any changes necessary to ensure the protection of trees on Municipal construction projects.

3.5.4 Increase Oversight

Correct implementation of Tree Protection measures is the best practice for providing tree protection. Training and any other tools or resources that are made available for inspectors will increase the successful implementation of tree protection standards and practices.

Staff will research available training courses to provide the knowledge to inspection staff that is critical in ensuring that tree protection is implemented on construction sites.

3.6 Forest Health and Pest Management

3.6.1 Implementation of a Pest Preparedness Program

Staff will monitor current and future forest pests (insects and diseases) that may have an impact on the urban forest. New pests, or changes to existing pests will result in the need to develop a Pest Preparedness Program to ensure Clarington stays ahead of impending issues.

3.6.2 Emerald Ash Borer Program

Staff will continue to address the impacts of emerald ash borer on our inventory of ash trees. The program will be reviewed and adjusted to ensure the most efficient and up-to-date information is used in decision making.

Figure 7. Emerald Ash Borer

3.6.3 Assessment of the Watering Program/Policy for newly planted trees

Staff will review and update the watering program for newly planted street trees to ensure trees are properly cared for in the critical establishment phase of tree planting. The majority of street trees in Clarington are planted by the developers of subdivisions. Staff will investigate making Gator Bags, or similar slow release watering systems, a requirement for new street tree planting projects.

3.6.4 Identification and planning for future forest health issues and climate change

Trees have a significant lifespan and staff must make decisions today that will affect future generations. For example, the choice of tree species and location in a park or on a boulevard can have affects for several decades into the future.

Staff will monitor and stay current on research and information available related to future forest health issues, including climate change.

4. IMPLEMENTATION

Several objectives in the Urban Forest Strategy can be implemented immediately, however complete implementation all strategic objectives will take longer as part of a more comprehensive *Urban Forest Management Plan*. Input from the public and relevant agencies will also be important in the development of an *Urban Forest Management Plan.*

The majority of the strategic objectives outlined in this document were developed to create operational efficiencies and/or reduce the long-term cost to the municipality to deliver services while enhancing the benefits provided by the urban forest.

5. CONCLUSION

The Urban Forest is a vital piece of green infrastructure within the Municipality of Clarington. It is important to the residents who live here. Urban forests play an important role in health and quality of life, plus they provide many economic and social values. Planning communities that incorporate urban trees and forests that are accessible, well maintained and safe provides significant public health benefits. Exposure to nature can create safe and comfortable conditions for vibrant, socially connected communities. The Urban Forest Strategy is intended to enhance those benefits over time without significant associated costs.

An increase in Urban Forest cover cannot simply be achieved by planting more trees. Effective Urban Forest management requires ongoing commitment to managing trees in all phases of their life-cycle, as well as strategic planning to bolster the resilience of the Urban Forest against the numerous stressors it may be subjected to. The primary objective should not be to simply meet a canopy cover target, but should be to steadily improve the condition of Clarington's Urban Forest through the implementation of the strategic objectives identified in this Urban Forest Strategy.

Partnerships with the community, interest groups and other agencies are an important component of many of the strategies proposed. However, another critical aspect of

ensuring long-term forest sustainability is adaptive management. Consistent review and adjustment of the Strategy will result in greater long-term forest health and sustainability. This Urban Forest Strategy is intended to create the building blocks for an *Urban Forest Management Plan* that will be adapted over time as new information, issues, pests, etc. are discovered.

Perhaps the most contentious issue in Urban Forestry today is the protection of individual trees on private property. Clarington has the option under the Municipal Act of instituting a Private Tree By-law that would prohibit or regulate the destruction or injuring of trees and require owners to obtain a permit to cut or injure any tree under municipal jurisdiction.

Staff recommends not pursuing a Private Tree By-law at this time. A comprehensive tree permit system would be expensive to administer and would be burdensome on individual property owners. Also the Municipality currently does not have the staff resources or adequate inventories of urban trees that would be protected through a permit system. For woodlands larger than 0.2 hectare (half an acre) there are policies and regulations in place to address tree clearing, enforcement is carried out in concert with Durham Region and the Conservation Authorities.

The need for an individual tree permit system and the capability of staff to implement a Private Tree By-law could change over time as our urban areas mature. Regular reviews of our Tree By-Law will provide the opportunity to re-visit the issue in the future.

APPENDIX A

OVERVIEW OF CURRENT NATURAL HERITAGE CONDITIONS IN CLARINGTON

Given that the municipality is located in a part of Ontario where the landscape is highly fragmented, all of the threats to natural heritage outlined in the previous section are relevant to Clarington, and can partially be addressed through defining a natural heritage system. A more specific look at the status of natural habitat in relation to land cover is provided below. The statistics in this section are based on an Ecological Land Classification system (ELC) and land cover mapping by CLOCA and GRCA. The ELC and land cover mapping is based on 2008 colour air photography.

Figure 7 shows a pie chart depicting the relative cover of major habitat and land cover types. For this analysis, Community Series level ELC types were lumped into the broader categories of forest, wetland, meadow, beach bluff and open water. Forest swamp has been depicted as a separate category as this functions as both forest and wetland, and can be added to the total cover of either one. Detailed land cover categories used by the Conservation Authorities have been grouped into agriculture/rural and urban land cover.

6.1 Forest

The Municipality of Clarington covers 61,350 hectares. Of this area 29.3 percent can be considered forest based on ELC forest when forest swamps are included. This figure is slightly below the 30 percent forest cover guideline recommended as a minimum

(Environment Canada 2004). Although these guidelines were designed to address Great Lakes Areas of Concern, they have been widely used for other landscapes because they are science-based. The forest cover figure for Clarington suggests that to even meet what many biologists have criticized as a very conservative minimum all remaining forest should be maintained and there should be an increase in cover to improve ecological health and function in the landscape.

Although there are some very large forest patches on the Oak Ridges Moraine (ORM), many of the remaining woodlands in Clarington are small and isolated – especially those in urban areas. Furthermore, given that many are found in valleylands and stream corridors, the shape of patches is often linear or convoluted, reducing the amount of forest interior. The distribution of forest cover in Clarington is skewed towards the north end of the Municipality on the ORM. Although this has the benefit of helping with water retention and maintaining the health of stream headwaters, the lower amount of cover in southern portions of the Municipality results in poor connectivity and lower capacity to support wildlife populations. Furthermore urban impacts contribute to higher negative impacts on the remaining woodlands, which are already compromised due to their size and shape.

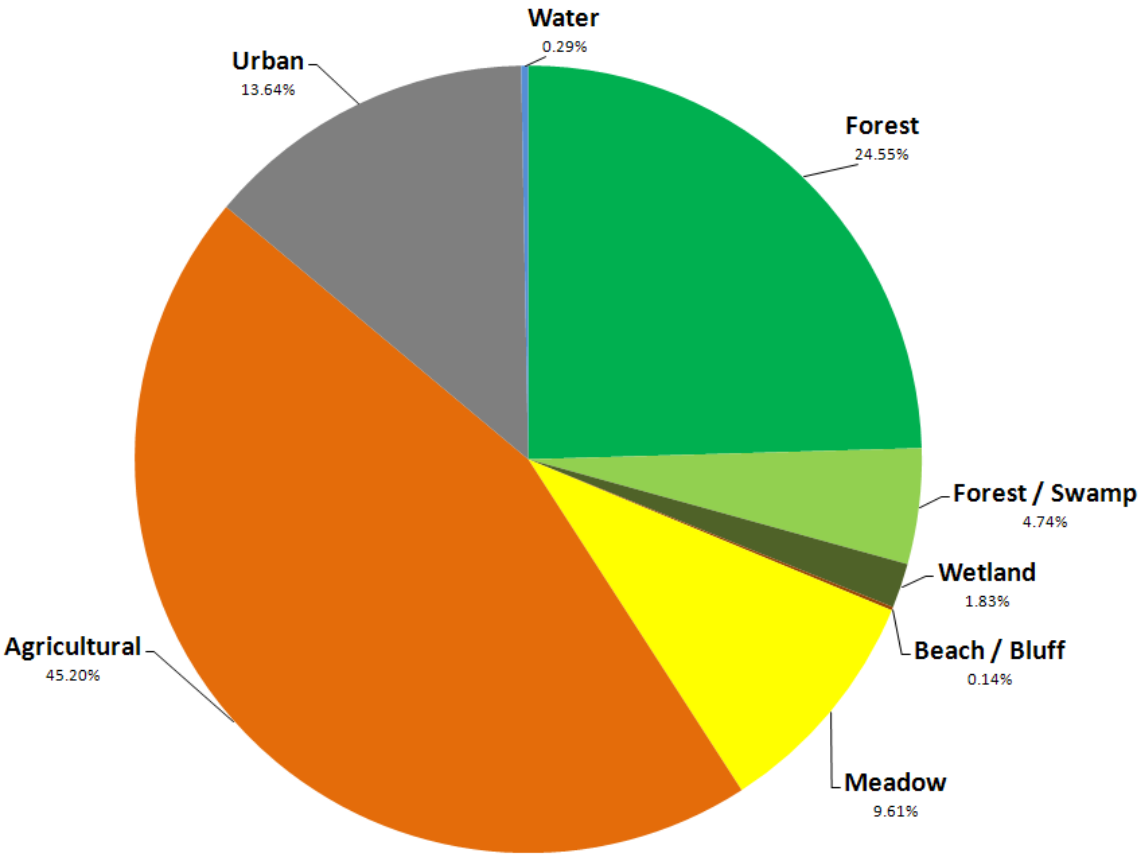

Figure 7. Pie chart showing percent cover of Clarington's major habitat types and land uses.

6.2 Wetland

Wetlands, including forest swamp, cover 6.6 percent of Clarington's area. The Environment Canada guideline suggests that greater than 10 percent of a landscape should be wetland. However, the amount of wetland in a given area is based to a large degree on soil types and precipitation patterns, therefore some regions may naturally support more or less than this recommended target. A recent study (Ducks Unlimited 2010) notes that for Durham Region the pre-settlement wetland cover was 12.6 percent and that by 2002 this had decreased to 7.8 percent. Some of this loss undoubtedly occurred in Clarington, and given that the remaining 6.6 percent is below both the 10 percent guideline and the pre-settlement figure in Durham it can be argued that all of what remains has significance and that opportunities to restore wetlands should be sought.

Most of the wetland in Clarington is composed of forest swamp as would have likely been the case historically. As such many of the conservation concerns described for forest - size and shape of patches, their connectivity and distribution, applies for these features as well.

Photo 5. Provincially Significant Bowmanville Coastal Wetland Complex.
Photo is looking northward toward the Bowmanville Urban Area. Photo courtesy of CLOCA, 2008.

Other large wetlands include the marshes along the Lake Ontario shoreline, most of which have some protection by Provincial policy.

Thicket swamp is a different community type that is dominated by shrub cover, while often maintaining open spaces allowing sunlight to penetrate. These are often prime amphibian breeding habitats and are preferred by the Western Chorus Frog, currently listed as federally Threatened. Because amphibians are important for transferring large amounts of energy and nutrients between wetlands and forests, maintaining the connectivity between these ecosystem types is vital.