



City of Niagara Falls Woodland Management Plan



Credits

The City of Niagara Falls Woodland Management Plan was advanced as a local partnership project between the City of Niagara Falls, the Niagara Peninsula Conservation Authority, the Park-in-the-City Committee and the Niagara Falls Nature Club.

The Niagara Falls Nature Club played a very significant role in this project. These dedicated volunteers completed all of the woodland data collection and reporting. Without their participation in this project, the completion of the Niagara Falls Woodland Management Plan would not have been possible.



Photo 1 - NF Nature Club Members, Credit: NF Nature Club



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Photo 2- Wild Lupine, Credit: NF Nature Club



1.0 Executive Summary

The City of Niagara Falls Woodland Management Plan is a comprehensive management plan for all City owned or controlled woodlands. This management plan lays out a road map that will ensure the long-term sustainability of City woodlands.

The Woodland Management Plan project was completed as a partnership project between City of Niagara Falls staff, Park-in-the-City volunteers, Niagara Peninsula Conservation Authority Staff and Niagara Falls Nature Club volunteers.

Data collection was done on 34 City woodlands utilizing the provincial standard Ecological Land Classification (ELC) inventory system. The ELC inventory system was augmented through extensive written field notes from volunteer data collectors from the Niagara Falls Nature Club. This data was examined scientifically with findings and recommendations stated.

Some of the major findings and recommendations can be summarized as follows;

- i. Invasive species are negatively affecting woodlands in significant way. Removal of invasive species needs to be a priority.
- ii. Negative impacts caused by people were common in many woodlands. Better physical protections must be established for many woodlands to ensure habitat is not lost by human activities. These include ATVs, motorcycles, general encroachments and dumping.
- iii. Recreational use of woodlands is extensive and in many situations is negatively affecting the ecosystems. More well planned trails and educational signage is needed to reduce negative ecological impacts while providing needed recreation.
- iv. Ash trees are a dominant species in most City woodlands. Many of these woodlands are showing the impacts of the Emerald Ash Borer insects. Reforestation efforts will be needed to ensure the long-term existence of these woodlands.
- v. More effort is required in promoting education about good woodland stewardship.
- vi. Future woodlands being acquired through development processes will need to be managed. To assist with this, developers should be dedicating woodlands in a proper condition with management planning already completed.
- vii. City staff should actively pursue opportunities to acquire important woodlands outside the development process where linked to current woodlands owned by the City.

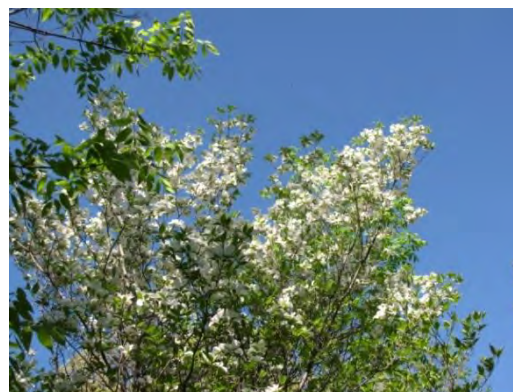


Photo 3 - Flowering Dogwood, Credit: NF Nature Club

Resources from the City of Niagara Falls shall be directed to implement woodland management and will be allocated in a strategic manner. A priority ranking of woodland management sites was developed



based on ecological, financial and community criterion. The short term focus of woodland management implementation should be placed on the top 10 priority ranked sites.

| Woodland Site Priority Rankings | | |
|--|------------------------|--------------|
| Priority # | Site | Score |
| 1 | 01 Walker Park | 31 |
| 1 | 24 Baden Powell Park | 31 |
| 2 | 19 Firemen's Park | 26 |
| 3 | 08 Paddock Nature Park | 25 |
| 3 | 11 Fernwood Woodlot | 25 |
| 4 | 12 Edgewood Woodlot | 23 |
| 5 | 21 Fern Park | 20 |
| 5 | 27 Hunter's Drain | 20 |
| 6 | 33 Bowman's Woods West | 18 |
| 6 | 25 George Bukator Park | 18 |

Table 1 - Woodland Site Top 10 Priority Rankings



2.0 Background

Context

The City of Niagara Falls owns 90+ City parks with a land mass of approximately 350ha. Of these parks approximately 20% contain some type of natural areas. In addition to parks, the City of Niagara Falls possesses a number of other properties that are not being managed as parkland but contain natural areas that do not have development land use designations/zoning. Furthermore the City acquires natural areas through the land development process regularly. As a result the City of Niagara Falls is one of the largest owners of natural lands within our City's limits.

Official Plan

The City of Niagara Falls Official Plan recognizes the importance of natural areas through its recent approval to the Natural Heritage policies.

12.1 Natural Heritage System

Preamble

Awareness of the connection between the natural environment and human health has increased in recent years and has been translated into land use planning through more stringent environmental policies at the Federal, Provincial and Local levels. Through the implementation of the policies of this Plan, the City intends to play a major role in the protection and conservation of resources.



Photo 4 - Tree Canopy at John N. Allen Park, Credit: NF Nature Club

Niagara Falls has an abundance of natural heritage features due to its location between two Great Lakes and along the Niagara River. The City is within the northerly extent of Carolinian Forests in Canada which boasts a high number and diversity of plant and wildlife. The conservation and wise use of natural resources is important to ensure that clean air and water will be part of the City's future...

12.1.39



The City recognizes the values and benefits of trees, hedgerows and woodlands to the overall environmental health of the community as well its visual appeal. The City shall place a high priority on the protection of these features.

12.1.43

Good stewardship of urban woodlots and forested areas shall be promoted...

Recreation, Arts & Culture Strategic Plan

Building upon the Official Plan policies, the City of Niagara Falls Strategic Plan for the Provision of Recreation, Arts & Culture (2007 final report) gives direction to the protection and management of natural areas within the ownership and/or control of the City of Niagara Falls. This directive is clearly outlined in Action Plan item #6, *Develop Improved Procedures for Environmental Protection and Park Management Practices*. A clear commitment to complete Action Plan Item #6 was reaffirmed in the 2013 Recreation and Culture Strategic Plan Implementation Strategy Update.

The Woodland Management Plan will address portions of action item #6 as it pertains to woodlands. The preservation and management of other park and non-woodland related natural areas as covered in action item #6 will be addressed in the future by other documents.

Purpose of the Woodland Management Plan

The purpose of the Woodland Management Plan is to develop a comprehensive management plan for woodlands (under the ownership and/or control of the City of Niagara Falls) to eliminate and/or mitigate negative impacts on these natural features. The Woodland Management Plan is not intended to be applied to privately owned lands.

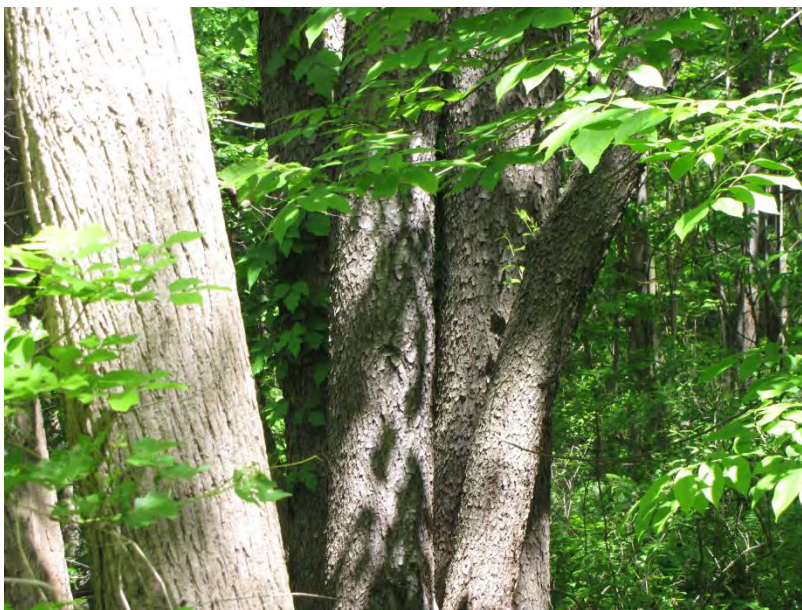


Photo 5 - Hackberry Trees, Credit: NF Nature Club

Woodland Management

Plan Deliverables

The document includes City-wide recommendations for management strategies appropriate to all City woodlands as well as site specific management work plans for all woodlands. All recommendations will reflect current scientifically accepted woodland management practices.



The Vision for the Future

A successfully implemented woodland management plan will ensure the long-term sustainability of City woodlands. Benefits will be provided to Niagara Falls in the form of;

- Public health improvement
- Increased community safety
- Heightened understanding/appreciation of Woodland ecosystems
- Providing ecological benefits and increasing ecological resilience
- A gift for future generations



Photo 6 - *Hibiscus palustris* (Rose Swamp Mallow) at Baden Powell Park, Credit: NF Nature Club



3.0 Methodology

Project Team

For the purposes of completing the Woodland Management Plan, a diverse project team was created. This working group was composed of; City Staff (Municipal Works, Planning & GIS), Park-in-the-City Committee members, Nature Club of Niagara Falls Members and Niagara Peninsula Conservation Authority Staff.

Site Identification

34 woodland sites were identified by the project team for investigation. Refer to Table 2. All sites are completely within the limits of Niagara Falls as well as owned and/or controlled by the City of Niagara Falls. The identification process largely utilized existing GIS mapping provided by the Niagara Peninsula Conservation Authority from their 2009 Natural Areas Inventory.

Data Collection

Woodland data was collected by a dedicated group of volunteers from the Nature Club of Niagara Falls. Collection work commenced in June 2013 and was completed in October 2013. The woodland data collection took approximately 500hrs of volunteer time.



Photo 7 – Plant identification by NF Nature Club members, Credit: NF Nature Club

Data Management

The Ontario Ministry of Natural Resources' Ecological Land Classification (ELC) inventory system was utilized to collect data. The ELC is the most widely recognized and utilized format in Ontario for the collection and management of natural area data. This will provide the data to be utilized in any future studies.

To facilitate the management of the ELC data, the ELC eTool software from EcoSim Software Inc. was used. This provided a flexible digital platform to gather, manage and report data while still within the standard ELC format.

In developing a work plan to collect and manage data, it was determined that the most relevant ELC data to this project is contained within the Plant data card and the Management/Disturbance data card. By focusing on these two data cards it allowed the Niagara Falls Nature Club to streamline their data collection process.



Woodland Polygons

Woodlands are generally not homogeneous ecosystems, as a result the scientific best practice is to (when needed) divide woodlands into component ecosystems for study. Woodland polygons are used to map the various component ecosystem types. In this woodland management plan, the volunteer data collectors established 1 or more polygons for each site depending on their field observations.

Reporting of Existing Conditions

Reports for each woodland site were created by the Niagara Falls Nature Club in the form of written reports augmented by the ELC eTool software. Mapping of woodlands ELC ecosystems was completed by City GIS staff.

Data Examination

Individual Woodland site reports and mapping was examined by the project team. Items of interest were identified. These included

special flora and fauna observations as well as matters that would impact the long-term sustainability of the woodland ecosystems.



Photo 8 - Vernal pool at Edgewood Park, Credit: NF Nature Club

Recommendations

Based on an ecosystem approach, recommendations to ensure the long-term sustainability of the woodlands were made. Recommendations that are generally applicable to all City woodlands are stated in section 5.0 Recommendations. Site specific recommendations are stated in each woodland site report in section 6.0 Site Reports.

Priorities

The priority sequencing of woodland sites for management was completed utilizing the collected ELC data. The City of Niagara Falls Development Charges By-law was also used to identify woodland sites with potential development charge funding availability.



| Area of Woodland Sites | | | | |
|-------------------------------|--|--------------------------|--------------------|-----------------|
| Site # | Site Name | Address | Area in Ac. | Area Ha. |
| 1 | Walker Park | 2006 Dorchester Rd | 25.86 | 10.47 |
| 2 | Walker Greenspace | 6251 Forest Ridge Dr | 4.27 | 1.73 |
| 3 | Theresa Park | 2864 Gail Av | 0.56 | 0.23 |
| 4 | Shriner's Creek & Woodlot | 7994 Mount Carmel Bv | 13.47 | 5.45 |
| 5 | Shriner's Creek South | Thorold Stone Rd | 1.74 | 0.7 |
| 6 | Mount Carmel Park | 7806 Mount Carmel Bv | 2.26 | 0.92 |
| 7 | NS & T Trail - Route I | 4260 Thorold Townline Rd | 8.25 | 3.34 |
| 8 | Paddock Nature Park | 4381 Paddock Trail Dr | 1.37 | 0.55 |
| 9 | Paisley January-Pool Pathway | 5670 Thorold Stone Rd | 5.62 | 2.27 |
| 10 | Glenview Park | 4521 Leader Ln | 0.82 | 0.33 |
| 11 | Fernwood Woodlot | 5635 Garner Rd | 12.43 | 5.03 |
| 12 | Edgewood Woodlot | Garner Rd | 23.28 | 9.42 |
| 13 | Deerfield Park | 8740 Forestview Bv | 7.66 | 3.1 |
| 14 | Gustavus Monro Park | 8180 Rideau St | 1.31 | 0.53 |
| 15 | John N Allan Park | 6980 Kalar Rd | 5.11 | 2.07 |
| 16 | Charnwood Park | 6729 Montrose Rd | 9.92 | 4.02 |
| 17 | MacBain Park | 7150 Montrose Rd | 4.44 | 1.8 |
| 18 | Oakwood Drive Woodlot | Oakwood Dr | 1.51 | 0.61 |
| 19 | Firemen's Park | 2275 Dorchester Rd | 44.68 | 18.08 |
| 20 | Weaver Park | 6613 Dunn St | 1.89 | 0.77 |
| 21 | Fern Park | 7516 Fern Av | 2.59 | 1.05 |
| 22 | Crimson Park | 6051 Crimson Dr | 1.15 | 0.46 |
| 23 | Montrose Business Park Woodlot | Montrose Rd | 42.29 | 17.11 |
| 24 | Baden Powell Park | 9240 Montrose Rd | 52.68 | 21.32 |
| 25 | George Bukator Park | 6040 Chippawa Py | 9.44 | 3.82 |
| 26 | Willick Road Woodlot | Willick Rd | 20.41 | 8.26 |
| 27 | Hunter's Drain | Willick Rd | 17.17 | 6.95 |
| 28 | Patrick Cummings Memorial Sports Complex | Willoughby Dr | 10.31 | 4.17 |
| 29 | Little Mississippi Drain | Niagara River Py | 5.28 | 2.14 |
| 30 | Willoughby Open Space | Willoughby Dr | 5.95 | 2.41 |
| 31 | Carl Road Woodlot | Carl Rd | 5.66 | 2.29 |
| 32 | Crowland Woods | Schisler Rd | 1.11 | 0.45 |
| 33 | Bowman's Woods - West | Sherk Rd | 33.9 | 13.72 |
| 34 | Bowman's Woods - East | Willoughby Dr | 61.1 | 24.73 |
| Total Area | | | 445.49 | 180.30 |

Table 2 - Woodland Sites



4.0 Findings

As outlined in the methodology section of this document data collection was completed by the Niagara Falls Nature Club using the ELC inventory system Plant Species and Management/Disturbance data cards. These data cards provide excellent information when assessing the quality and health of woodlands. These two data cards can also provide guidance in determining what management actions are required to ensure long-term woodland sustainability.

The following are summarizations of findings from the data collection process. More detailed site specific findings are located within Section 6, Site Reports. ELC data cards can be found in Appendix C.

Diversity of Species

Determining diversity of species is important for woodlands. Diversity of species is an indicator of woodland health and quality. In general a higher the species diversity indicates a healthier woodland.

Diversity of Species on All Layers

Map 2 -appendix A indicates the diversity of species on all ecological layers. This data set indicates higher levels of diversity in woodlands

associated with the Niagara Escarpment and the Welland River corridor. A lower level of diversity is generally found within woodlands in the developed areas.

Diversity of Species – Layer 1 (Canopy)

Map 3 -appendix A indicates the diversity of species on ecological layer 1 (canopy). This data set looks at the biodiversity of the woodland canopy trees. The data generally indicates that diversity of woodland canopy is higher in the areas outside the developed core.



Photo 9 - Large Pin Oak at Charnwood Park, Credit NF Nature Club



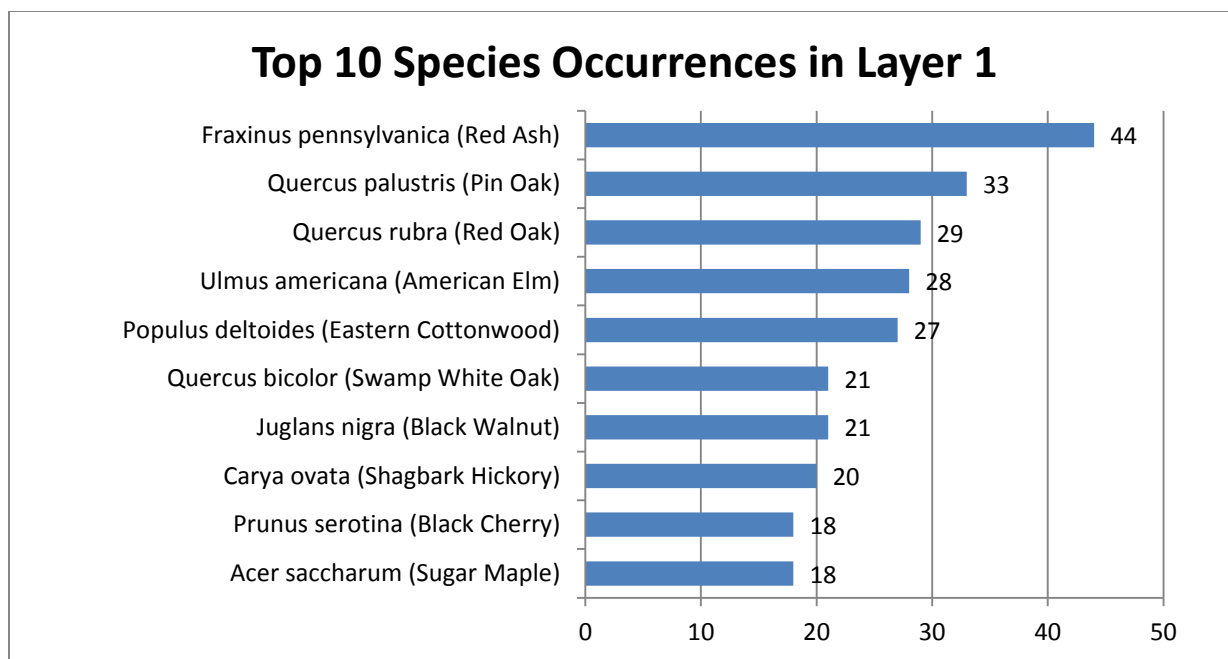


Chart 1- Top 10 Species Occurrences in Layer 1

Diversity of Species – Layer 2 (Sub-Canopy)

Map 4 -appendix A indicates the diversity of species on ecological layer 2 (sub-canopy). This data set looks at the diversity of the woodland sub-canopy trees. The data does not indicate any significant geographical correlations.

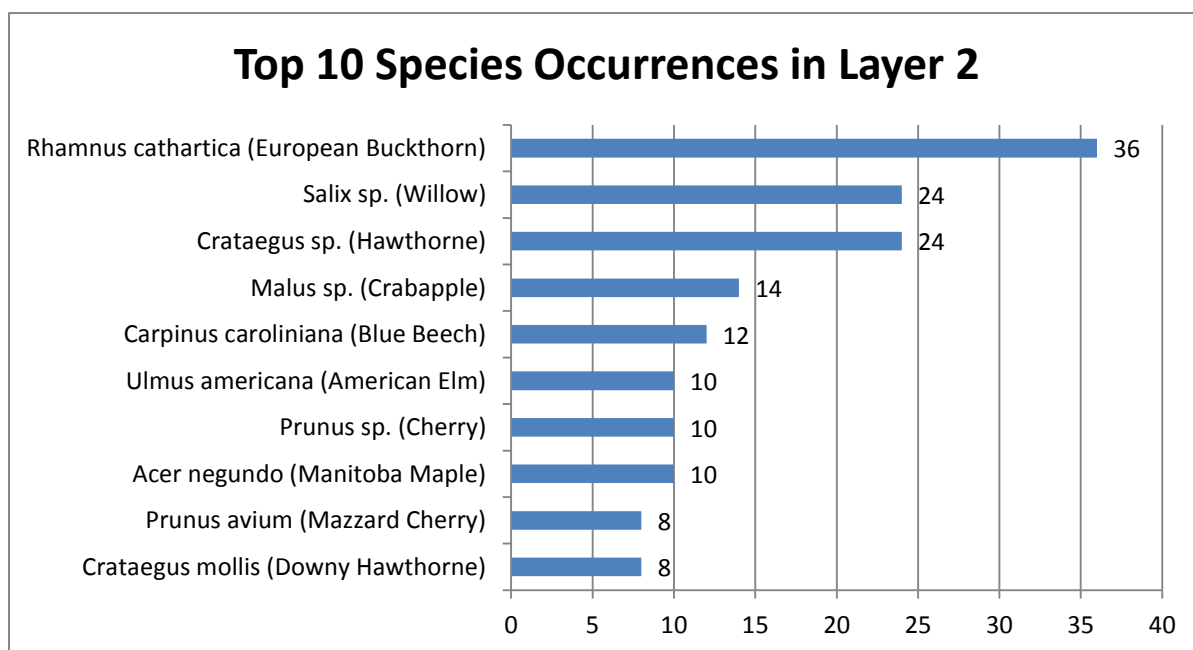


Chart 2- Top 10 Species Occurrences in Layer 2



Diversity of Species – Layer 3 (Understory)

Map 5 -appendix A indicates the diversity of species on ecological layer 3 (understory). This data set looks at the diversity of woodland understory shrubs. The data generally indicates that diversity of woodland understory is higher in the areas outside the developed core.

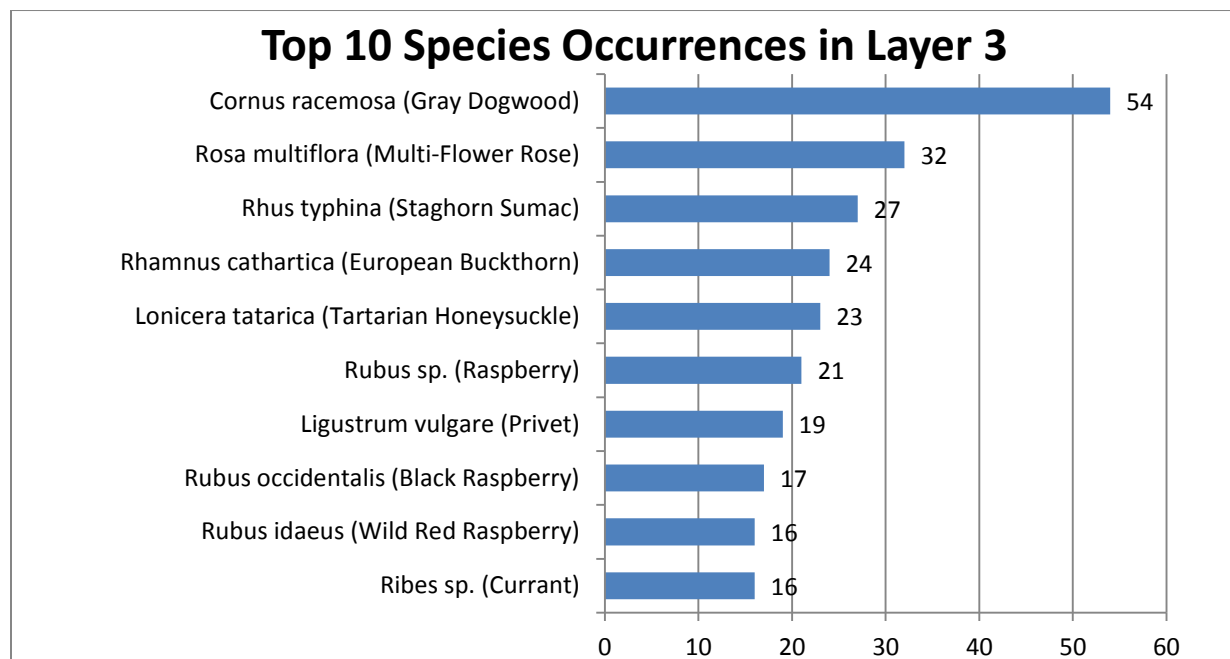


Chart 3- Top 10 Species Occurrences in Layer 3

Diversity of Species – Layer 4 (Ground Level)

Map 6 -appendix A indicates the diversity of species on ecological layer 4 (ground level). This data set looks at the diversity of woodland ground level vegetation. The data generally indicates that the richest diversity is associated with the southern portion of the City and woodlands associated with the Niagara Escarpment.



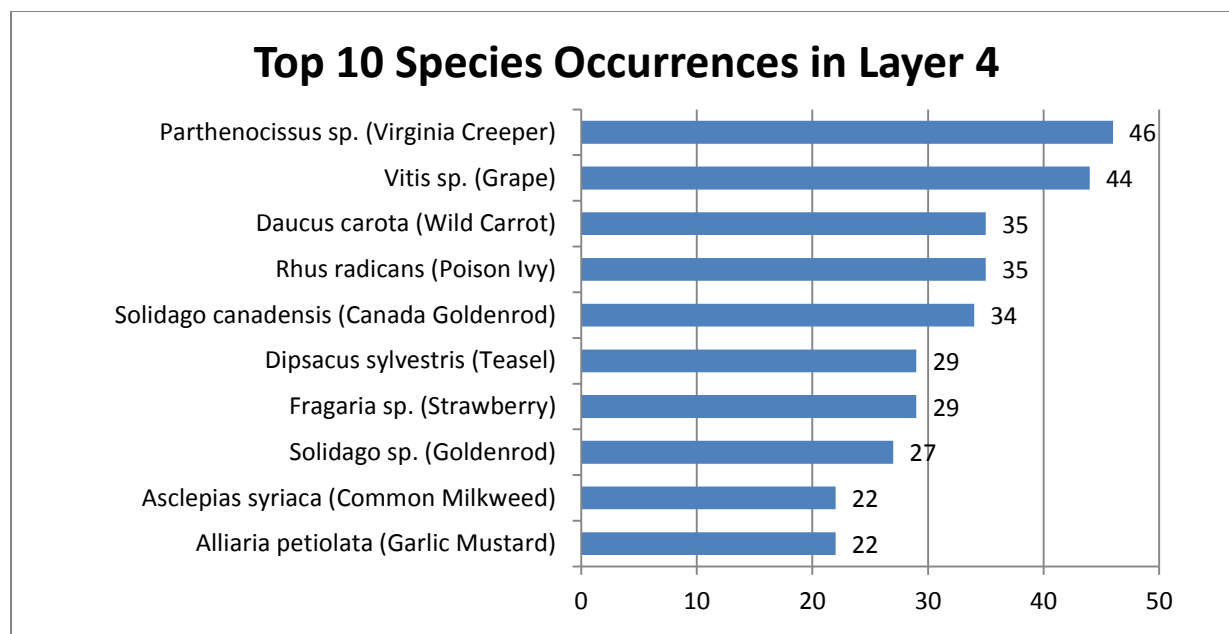


Chart 4- Top 10 Species Occurrences in Layer 4

Diversity of Species Summary

The plant species diversity data generally indicates that the richest diversity is found in woodlands that are associated with major natural heritage corridors (Niagara Escarpment and the Welland River.) Furthermore woodlands outside of the developed city area tend to have a higher level of diversity.

Invasive Species

Invasive plant species pose a significant risk to woodlands throughout Southern Ontario. The harm that most invasive species cause is from out competing and displacing native woodland plants. This displacement effect causes a reduction in plant species diversity which in turn reduces the quality of the woodland.



Photo 10 - Multiflora Rose: attractive but invasive, Credit: NF Nature Club

Most of these invasive species were introduced to the area by people as non-native ornamental and/or edible plants. Some of these invasive species are still being propagated in private gardens within the City.



Extent of Invasive Species – All Varieties

Map 7 indicates the extent of all types of invasive species. This clearly shows that invasive species are present in nearly all parts of City woodlands regardless of geographic area.

All Varieties – Invasive and Aggressive Invasive

Not all invasive species are equal in impacting woodlands. Due to this fact the invasive plant species have been divided up into 2 categories. These categories are; Invasive and Aggressive Invasive. As the category name implies, the Aggressive Invasive species have significantly more impact on woodlands than other plants within the invasive species category. Map 8 shows the separation of invasive species illustrated on Map 7 into the Invasive and Aggressive Invasive species categories. This map indicates nearly uniform presence of aggressive invasive species in City woodlands.



Photo 11 – Roundleaf Green Briar (*Similax rotundifolia*) at Fernwood Park,
Credit NF Nature Club

Aggressive Invasive Species

Maps 9 through 14 inclusive illustrate the distribution of key aggressive invasive plant species with City woodlands. To better understand the impacts, an estimation of woodland site abundance was done for each of the locations.

The mapping indicates that the largest issue with aggressive invasive species is the wide spread presence of European Buckthorn (*Rhamnus cathartica*). There is also City wide concerns with Garlic Mustard (*Alliaria Petiolata*). Purple Loosestrife (*Lythrum salicaria*) is significant concern throughout the Welland River corridor and along the Niagara Escarpment.

Invasive Species Summary

Invasive species have a significant presence throughout City woodlands. What is most concerning is the large abundance of aggressive invasive species. It can be expected that over time the issue of invasive species will get more significant and cause a steady decline in woodland plant species diversity.

Species of Interest

Within City woodlands there are numerous species of special interest that should be recognized for their significance. Management plans must acknowledge the existence of the special flora and ensure their long-term health.



Species with Provincial and Federal Status

6 City woodlands were found to contain plant species with provincial and federal preservation status. Refer to Maps 15 to 17. These locations are summarized as follows in table 3.

| Woodlands with Provincially and Federally Significant Species | | | | |
|--|----------------------|-----------------------|-----------------------|----------------------------|
| Site # | Woodland Name | Common Name | Botanical Name | Preservation Status |
| 1 | Walker Park | Flowering Dogwood | Cornus florida | Provincial |
| 11 | Fernwood Woodlot | Roundleaf Green Briar | Similax rotundifolia | Federal and Provincial |
| 12 | Edgewood Woodlot | Roundleaf Green Briar | Similax rotundifolia | Federal and Provincial |
| 19 | Firemen's Park | Flowering Dogwood | Cornus florida | Provincial |
| 19 | Firemen's Park | White Walnut | Juglans cinerea | Provincial |
| 24 | Baden Powell Park | Rose Swamp Mallow | Hibiscus palustris | Federal |
| 33 | Bowman Woods | Roundleaf Green Briar | Similax rotundifolia | Federal and Provincial |

Table 3 - Plant Species with Federal and/or Provincial Status

It was noted in field observations that *Cornus florida* trees in both Walker Park and Firemen's Park were experiencing stresses from invasive species.

Old Growth Present

A recognized definition for old growth forests are woodlands that have 10 or more trees that are at least 100 years old. This age of tree is generally uncommon with the Niagara Region as most parts had been deforested at one time over the past century. Map 18 identifies 4 locations within City woodlands where old growth trees were observed.

The most notable old growth trees are the *Nyssa sylvatica* (Blackgum) located at Bowman Woods West. This is the largest known stand (approximately 48) of old growth Blackgum trees. This stand of trees contains specimens that vary in age between 250 -400 years old. The wood from Blackgum trees is not valuable as it cannot be split by axe or sanded smooth and used as furniture. It is believed that because of this uselessness, these Blackgum trees were spared from logging.

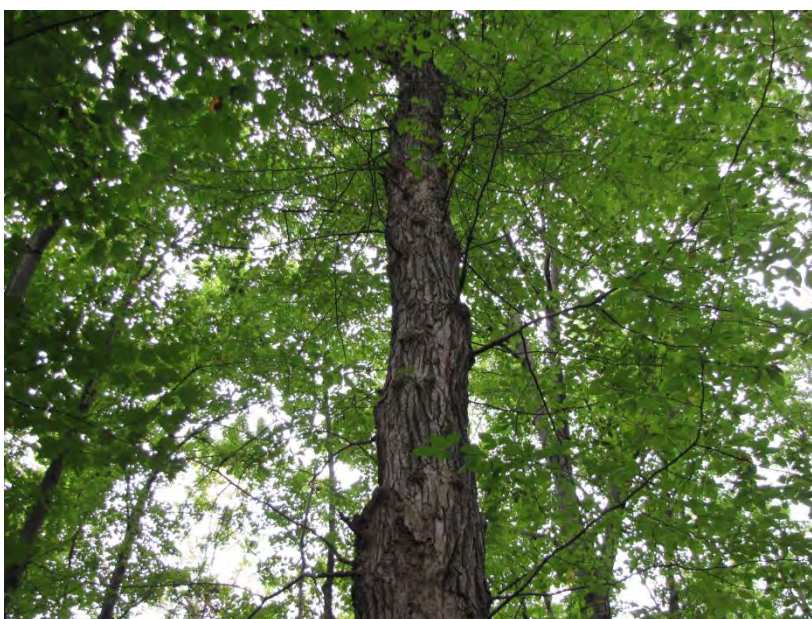


Photo 12 - Old Growth Blackgum Tree at Bowman's Woods West, Credit: NF Nature Club

Ash Trees

29 of the 34 City woodland sites had observations of ash trees. Map 19 identifies the observation locations and the general abundance of the species. In



most locations the ash trees were determined to be an abundant or dominant species in the woodlands. This suggests that the Emerald Ash Borer could cause a significant impact on the health of City woodlands if most of these trees were killed.

Management/ Disturbance

As discussed above, ELC Management/ Disturbance data cards were used in the recording of field observations by the Niagara Falls Nature Club. These data cards look closely things that may cause negative woodland impacts. It should be noted though that not all category items may be currently causing negative impacts to specific woodlands and as such should not be looked at as issues of equal magnitude.

Alien Species

For the purposes of this woodland management plan the use of the term “alien species” is interchangeable with the name “invasive species.” Alien species is used as name because that is how the ELC Management/Disturbance data cards reference this issue. Although the recording of ELC data on alien species may seem redundant, the Management/Disturbance data card assesses a rating for the category in a different manner than simple species abundance. It is for this reason; it was felt that this data was important and as such should be examined.

Observations of alien species are illustrated on map 20. It should be noted that vast majority of woodland sites are affected by alien species with most receiving a moderately high score. This confirms the findings previously discussed under the invasive species section.

ATV (Including Motorcycles)

ATVs and motorcycles can have a significant negative impact on woodlands and are banned from all City parks under the parks By-law. These recreational vehicles tend to cause damage to understory and ground level plant species as well as disturb wildlife. In addition they cause significant impact on public safety. This is largely due to the potential for collisions and frequent trail rutting.

It was found that much of the ATV and motorcycle use was found in woodland sites along the Niagara Escarpment and the Welland River. Refer to map 21 to see the degree of the disturbances per site polygon.



Photo 13 - Trail rutting at Baden Powell Park, Credit: NF Nature Club

Death/Disease

Observations of death/ disease were mainly recorded for trees. A certain amount of tree death/disease can be a natural part of a healthy woodland ecosystem. Dead trees can provide needed habitat for



wildlife. When death/disease is in excessive amount then there is a potential for significant negative impacts on the woodlands. Indicators could be disease, disturbance or other issues such as a change in drainage patterns.

It was observed that a significant amount of woodland sites contained many dead and dying ash trees. This is likely the sign of a City wide infestation of Emerald Ash Borer insects. The findings of the degree of death/disease within the woodlots are shown on map 22.

Deer Browse

Evidence of deer browse was found in a number of City woodlands as shown on map 23. However the deer browse was not significant as such was generally scored low.

Dumping (Including Construction Related Items)

Dumping within woodlands significantly affects ground level plants and takes away wildlife habitat. Map 24 shows that most of the woodlands are affected by this problem.

Dumping can take many forms. Some of the most commonly dumped items include; household garbage, auto parts, construction debris, furniture and dirt fill. Yard waste is probably the

most common materials dumped in woodlands. Although the yard waste may be biodegradable it generally dumped in piles that do not degrade quickly enough. As a result yard waste impacts the ground level plants much like other types of dumped waste.



Photo 14 - Bike ramps and dumping at Weaver Park, Credit: NF Nature Club

Earth Displacement

Earth displacement was not found to be a significant concern in most woodlands. In the locations where it was observed it was in form of ATV/motorcycle rutting as well as BMX bicycle obstacles. Refer to Map 25.

Encroachment

Encroachment occurs when woodland areas become occupied by adjacent property owners/tenants. Encroachments usually come in the form of; cutting of understory and ground level plants, the establishment of lawn areas and gardens, the placement of fire pits, lawn furniture and other backyard amenities within the woodlands. In addition another common encroachment is the “cleaning-up” of



woodlands which includes the removal of forest deadfall and other perceived unsightly material that is important to the forest ecosystem.

Encroachment is not allowed in city parks (including woodlands) under the parks By-law.

Through the field investigations, it was found that encroachment was not a significant issue in most woodlands. Refer to Map 26. This being said encroachments were found and a number of them were causing significant impact on the woodlands.

The most common encroachment found was the establishment of lawn areas and landscaping within woodlands. These were most commonly found where the residential property and woodland property limits were not defined by a fence. Likewise it was also found that most woodlands that have perimeter fence have little to no encroachments.

It was noted in a number of conversations with neighbours that there is often a concern with long natural vegetation adjacent to their rear yards due to possible undesirable rodent and tick migration into their backyards. As such many residents undertake encroachment cutting to address their concerns.



Photo 15- Wood frog in vernal pool at Deerfield Park, Credit: NF Nature Club

Flooding

The presence of flooding was found in a small number of woodlands and is illustrated on map 27.

Flooding for the most part is not a significant issue with most of it being due to adjacent municipal drains and ditches.

Gaps in Forest Canopy

Gaps in forest canopy were found in a number of City woodland regardless of geography. Refer to map 28. It is expected that forest canopy gaps will get worse over time as ash trees continue to die due to the emerald ash borer.

Noise

Noise was observed in most woodlands and is quite common in all urban woodlands as shown on map 29. This being said, the impact from noise didn't appear to be significant.

Plantation

The presences of plantation trees are generally not a detriment to woodlands. The issue with plantations is that there is generally a lack of diversity in both plant species and age and as such doesn't enhance the quality of woodland. The observed plantations are noted on map 30. Most plantations were in the form of linear planted conifers.



Recreational Use

If managed properly recreational use is not necessary a negative impact on woodlands, however unmanaged or poorly managed woodlands can be devastated by recreational use. Higher amounts of recreational use can indicate a public desire to spend time enjoying nature.

Recreational use was observed in nearly all City woodlands. Refer to map 31. Some of the most use was found along the Niagara Escarpment and Welland River corridors.

Tracks and Trails

Tracks and trails were observed in the vast majority of woodlands within the City as indicated on map 32. Much of what was found were recreational trails however some deer trails were noted.

In most locations these trails were unplanned and were established by local individuals. There is some concern with many unplanned trails as they don't always avoid sensitive

natural habitat. In some situations these unplanned trails disburse throughout the woodland understory causing significant loss of habitat.



Photo 16 - NS&T Trail, Credit: M. Vogt

The most significant planned trails were found along the Niagara Escarpment corridor. These were established by the Bruce Trail Association and have received regular management.

Wind Throw

Wind throw was not found to be a significant concern within the City woodlands. Refer to map 24. It is believed that wind throw could become a larger issue in the future with the continual decline of ash trees due to the Emerald Ash Borer.



5.0 Recommendations

The vision for the future of City woodlands is based on the requirement for long-term sustainability of the woodland ecosystems. To achieve this long-term sustainability scientific interventions are needed to address issues outlined in section 4.0 Findings section of this document. Failure to undertake proper interventions will not assist in correcting issues and the degradation of woodland ecosystems will continue.

Plans for proper scientific interventions must recognize that;

- Woodlands are complex ecosystems and must be looked at as an entirety.
- Multiple woodlands within close proximity to each other function as wildlife corridors.
- Niagara Falls woodlands are situated within or close proximity to urban areas and as such experience non-natural stresses.
- There is a significant desire by people to experience woodlands on a daily basis.

Protection and Enhancement

Scientific interventions can take the form of Protection and Enhancement. The following is a list of City-wide recommendations for interventions. Site specific recommendations are identified in each woodland site report located in section 6.0.

Fencing, Barriers and Property Line Delineation

1. Where property line fences exist adjacent to private properties, these fences shall be maintained generally as-is. To help maintain understory and ground level plant health, new gates in these fences should not be allowed. Where existing gates are allowing significant ecological damage to occur, these gates should be removed.



Photo 17 - Clammy Ground Cherry, Credit: NF Nature Club

2. In woodlands that have a history of ecological damage related uncontrolled access at public entrances additional appropriate woodland barriers shall be established. This is a significant concern in locations where ATV/motorcycle use as well as dumping of waste is high. Woodland barriers shall be carefully planned to ensure that the ecological damage isn't just relocated somewhere else.



3. Where existing woodlands are adjacent to existing private properties and do not already have property line fences, no new fences shall be installed by the City. If ecological damage is occurring along an undefined property line then boundary delineation shall be installed through the use of property line monuments.
4. Fencing without gates shall be requested as a condition of lot creation (subdivision, condominium or severance) wherever properties are adjacent to a City owned woodland.

Ecological buffers

5. Ecological buffers shall be established around woodlands where possible. Ecological buffers shall provide protection to areas of sensitive woodland ecological features and be treated as future woodlands.



Photo 18 - Oak tree regeneration, Credit: NF Nature Club

Maintenance Buffers

6. Maintenance buffers shall be established between woodlands and private property where possible. This land will provide a maintained interface between properties and allow for needed maintenance operations to be performed by the City without causing harm to woodlands and following the City's park standards. The buffer shall have a minimum width of 3.0m (10'). Maintenance buffers shall not be established within ecological buffers unless it can be demonstrated compatible.

Community Stewardship

7. Community stewardship of City woodlands shall be encouraged. Opportunities for an Adopt-a-Woodland or Friends of the Woodland program shall be investigated by City staff. The City of Niagara Falls shall promote and support the formation of such groups and integrate them into existing frameworks such as the Adopt program administered by City staff, as best as possible
8. Where interest from the community is present, community programs such as tree plantings, invasive species removals and garbage cleanups will be encouraged by the City, and be used as an opportunity to educate land owners about beneficial and negative actions towards the wood lot.
9. A City wide pamphlet shall be created to educate the public about woodland ecosystems and how they can help ensure the long-term sustainability of the City woodlands. Where desired site specific information papers (that may include relevant history, existing flora and fauna species and a trail map) may be made available by the City.



10. Unified signage shall be established at all City woodlands that educate the public about the importance of woodlands and how people can help conserve them. Signage will include information about how to find out more about the wood lots (e.g. A city link or a QR code).
11. Woodlands and their proper management should be promoted on the City's website and through other digital platforms.

Construction

12. City woodlands shall be protected from negative construction impacts. When needed, vegetation preservation and/or siltation control fences shall be installed.
13. To prevent flooding from becoming an issue, drainage design for lands upstream of woodlands shall ensure that run-off doesn't exceed pre-development/construction levels.
14. Natural drainage outlets for woodlands shall be preserved at all times to prevent changes in water balance.

Invasive Species

15. The City shall initiate a program for the removal of invasive species within City woodlands. Partnerships for this work shall be explored.
16. Gaps in forest canopy may allow invasive species to establish and/or expand in woodlands. Management plans shall ensure that any gaps are planted with appropriate native species.

Trails

17. Where appropriate woodlands shall contain trail(s) that allows for public enjoyment of the woodland in a responsible manner. Effort shall be made to avoid impacting the most sensitive areas within woodlands. Any vegetation removal during trail development shall be kept to a minimum. Impacted vegetation shall be relocated within the woodland when possible.
18. Trails that are causing (or have the potential to cause) ecological damage shall be closed.
19. The trails shall have dirt or woodchip surfacing. When determined appropriate these trails may have sections of granular materials or hard surface paving.
20. The minimum clear width of trails with shall be 1.2m wide with a clear height of 2.1m. These dimensions may be reduced in locations to avoid negative ecological impact.
21. Where appropriate wood boardwalk may be used for trails when crossing wet and/or highly sensitive areas.
22. Trails shall connect to existing neighborhood/city wide trail systems where possible.

Signage

23. All City woodlands shall receive standardized woodland signage at the main entrance(s) to the woodlands. The signage shall include information about by-laws as well as stewardship.



Photo 19 - Nature area sign at Theresa Park, Credit: NF Nature Club



24. Where appropriate informative site specific signage shall be developed for some woodlands. The focus of this signage will be to educate the public about special ecological features within these woodlands.

Restoration and Enhancement Plantings

25. City staff shall work with the surrounding community, interested individuals, groups and agencies to implement restoration planting within (or adjacent to) woodlands that have been disturbed as per the Site Reports contained in Section 6 of this Plan.
26. A program shall be established to reforest woodlands that have been (or will be) impacted by the emerald ash borer.
27. City staff shall identify opportunities to enhance ecological linkages between City and non-city woodlands through development proposals. This should include establishing appropriate habitat for wildlife.

Maintenance

28. Woodlands shall be maintained by City staff to municipal parkland standards. City staff shall ensure that woodlands are maintained in a safe and aesthetically pleasing fashion for public use.
29. Trees (dying or dead) shall not be fallen within woodlands unless they have been determined to be a hazard tree. Hazard trees are dead or dying trees that may cause harm to people and/or their property.
30. Maintenance operations shall be carried out in an ecologically responsible manner that maintains the health of the woodlands.
31. Where needed garbage receptacles shall be placed in an area that is near the trail entrance and accessible and convenient for both users and waste removal services.

Woodland Acquisition through Development

As Niagara Falls continues to grow, it is anticipated that developers will be dedicating existing private woodlands to the City. As a result there will be more woodlands that will require proper scientific management. To ensure that proper management is completed, development conditions/agreements shall include the special requirements.

32. Developers shall have qualified experts complete site specific woodland management plans for woodlands that will be dedicated to the City. The recommendations of these plans shall be consistent with the City of Niagara Falls Woodland Management Plan.

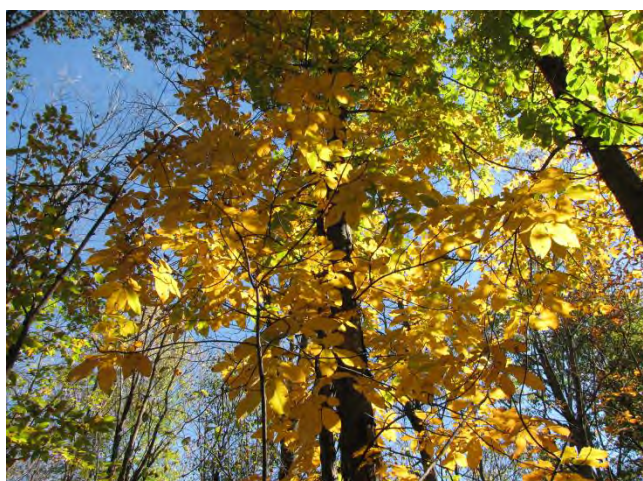


Photo 20 - Tree canopy at Montrose Rd Business Park Woodlot,
Credit: NF Nature Club



33. Developers shall also be required through the development agreements to undertake the woodland management work linked to the subdivision assumption process.
34. Sufficient lands shall be dedicated with the woodland to allow for an ecological buffer between the woodland and development parcels. Ecological buffers shall not be located on private lands and will be sized to ensure the long term health of the woodland.
35. Sufficient lands shall be dedicated to allow for a maintenance buffer between the woodland and private properties. Maintenance buffers shall not be located on private lands.
36. Developers shall install perimeter fencing around all woodlands (except public entrances) in compliance with City park standards. Gates won't be allowed in the fences. Fencing shall be located on the common property line between private property and the woodland. At a minimum fencing shall be 1.5m high commercial grade chain link.

Other Woodland Acquisitions

These acquisitions may take the form of City purchases, land exchanges or as ecological gifts/donations.

37. As opportunities arise the City of Niagara Falls should acquire woodlands that meet strategic priorities for the long-term sustainability of City woodlands. These priorities include;
 - 37.1. Acquisition of woodland areas that contiguous or in very close proximity with existing City woodlands.
 - 37.2. Acquisition of woodland areas that contain special natural heritage species. These may include federal and provincially protected species as well as old growth species.
 - 37.3. Acquisition of woodland areas that provide for enhanced educational and/or recreational use to the public.
38. Known woodlands that satisfy proposed priority acquisition criteria that should be pursued include;
 - 38.1. Woodlands along the Niagara Escarpment that are generally contiguous with existing City owned woodlands at Walker Park and Firemen's Park.
 - 38.2. Woodland areas that contain compose part of the Bowman Woods old growth forest.
39. City staff shall promote the opportunity for citizens and organizations to make ecological gifts/donations of woodlands to the City.

Governance

40. City of Niagara Falls staff shall provide two status updates to the Park in the City Committee per year.



6.0 Site Reports



7.0 Woodland Management Priorities

Implementation of the vision for the future of the City woodlands requires careful consideration. Taking recommendations in sections 5.0 Recommendations & 6.0 Site Reports and making them occur requires the creation of specific projects. Some of these projects requires site specific interventions to make improvements in the woodlands where as others take the form of education and policy improvements that will guide others. All projects require the allocation of staff time and/or funds. Due to this fact, priorities must be established so that these finite resources can be best allocated.

Priority Methodology

To evaluate and rank woodland sites based on priority a set of criterion is required. A set of 5 criterion was developed to capture issues under the headings of; Ecology, Financial and Community priorities. These 5 criterions are;

- **Ecological Priorities**
 - **Federal / Provincial Protected:** Does the woodland contain a plant species that has federal or provincial protection? These plants may be designated as Species at Risk.
 - **Woodland Stress:** Does the woodland contain disturbance indicators that the ecosystem is under stress? These indicators may include; Invasive plants/species, diseased/dead trees, gaps in tree canopy, ice damage and wind throw
- **Financial Priorities**
 - **Development Charge Funding:** Is the woodland eligible for development charge funding based on the latest City of Niagara Falls Development Charges By-Law?
- **Community Priorities**
 - **Community Use:** Does the woodland contain indicators that the area is currently being used by the community for recreational and/or educational purposes? These indicators may include; observed use and the presence of trails.
 - **Human Disturbance:** Does the woodland suffer from impact due to human activities? These indicators may include; garbage dumping and property encroachments.

Priority scoring was completed for each woodland site based on a numerical scale. The higher the number value the greater the priority the woodland site is based on the specific criterion. Federal/Provincial Protected and Development Charge Funding criterions were determined on a binary type 0 or 10 scoring. Whereas Woodland Stress, Community use and Human Disturbance criterions were rated on a scale type 0 to 10 scoring. The score of each of the 5 criterions are then added together to determine the overall priority score for the woodland site.



Priority Scoring

Based on the above priority methodology, the following is the priority ranking for all woodland sites. For a complete rating of each location refer to Appendix B.

| Priority # | Site | Score |
|------------|---|-------|
| 1 | 01 Walker Park | 31 |
| 1 | 24 Baden Powell Park | 31 |
| 2 | 19 Firemen's Park | 26 |
| 3 | 08 Paddock Nature Park | 25 |
| 3 | 11 Fernwood Woodlot | 25 |
| 4 | 12 Edgewood Woodlot | 23 |
| 5 | 21 Fern Park | 20 |
| 5 | 27 Hunter's Drain | 20 |
| 6 | 33 Bowman's Woods West | 18 |
| 6 | 25 George Bukator Park | 18 |
| 6 | 02 Walker Green Space | 16 |
| 7 | 13 Deerfield Park | 15 |
| 7 | 16 Charnwood Park | 15 |
| 7 | 29 Little Mississippi Drain | 15 |
| 8 | 06 Mount Carmel Park | 14 |
| 8 | 26 Willick Road Woodlot | 14 |
| 8 | 28 Patrick Cummings Memorial Sports Complex | 14 |
| 8 | 30 Willoughby Open Space | 14 |
| 9 | 20 Weaver Park | 13 |
| 10 | 17 MacBain Park | 12 |



| Priority # | Site | Score |
|------------|-----------------------------------|-------|
| 11 | 10 Glenview Park | 12 |
| 12 | 09 Paisley January-Pool Pathway | 11 |
| 13 | 04 Shriners Creek and Woodlot | 10 |
| 13 | 07 NS and T Trail | 10 |
| 13 | 18 Oakwood Drive Woodlot | 10 |
| 13 | 23 Montrose Business Park Woodlot | 10 |
| 13 | 34 Bowman's Woods East | 10 |
| 14 | 05 Shriner's Creek South | 9 |
| 14 | 15 John N. Allan Park | 9 |
| 15 | 14 Gustavus Monro Park | 8 |
| 16 | 32 Crowland Woods | 5 |
| 17 | 22 Crimson Park | 4 |
| 18 | 03 Theresa Park | 3 |
| 19 | 31 Carl Road Woodlot | 2 |

Table 4 -Woodland Site Priority Rankings

Other Priorities

The priority ranking shown above was determined by the best information collected through the Woodland Management Plan process. This is a static priority ranking based on a snap-shot in time and will not reflect future unforeseen issues and other community based initiatives. As a result the City of Niagara Falls may choose in the future deviate from this priority list.



Appendix A - Maps



Appendix B – Woodland Site Priority Scoring



Appendix C - ELC Data Cards

