

# *Crothers' Woods Trail Management Strategy*

*July 2007*



*The Planning Partnership  
Bird & Hale  
International Mountain Bicycling Association*



# Executive Summary

Crothers' Woods is a natural area park and part of continuous parkland extending through the Don Valley. It serves as both a destination and popular access point to the system. Over the past several decades, an informal network of trails has been created. In Crothers' Woods over 10 km of trails are used by hikers, dog walkers, trail runners and nature enthusiasts. Many of the trails were never actually planned and as a result are unsustainable and are degrading the environment. Heavy use has left many of the trails in poor condition leading to degradation and negative impacts to the natural environment including soil compaction, erosion and damage to the forest habitat.

The purpose of this Trail Management Strategy is to provide the City of Toronto Parks, Forestry and Recreation with a strategy for making improvements in the park to ensure protection, restoration and enhancement of the Crothers' Woods area. The plan includes recommendations for:

- The preservation and protection of existing natural heritage features;
- Creating a safe, logical, sensitive and practical trail system which serves a wide range of user groups;
- Meeting the operational and maintenance requirements of the City of Toronto Parks, Forestry and Recreation Department;
- Improving park users' safety and reducing liability of the City;
- Implementing the various initiatives and improvement proposed as part of this plan;
- Defining a monitoring program as a means to gauge the long term health of the park ecosystem; and,
- Identifying guiding principles to be

applied to other relevant natural areas in the City.

The Plan is divided into two parts and three appendices:

**Part 1: Background**, provides an overview of the existing conditions and current management initiatives underway in the park.

**Part 2: Recommendations**, outlines suggested improvements to the park including the establishment of management zones, enhanced by-law enforcement, signage and wayfinding and park maintenance. Recommended priorities and the roles and responsibilities for implementing the recommendations are also provided.

**Appendix A: Natural Heritage Inventory and Analysis**, provides an overview of the Natural Heritage Inventory and Analysis undertaken as part of the study.

**Appendix B: Guiding Principles for Trail Management Strategy**, provides recommendations for the establishment of management zones, invasive species management, and habitat restoration. These recommendations are not only applicable to Crothers' Woods, but should also be applied to other natural areas in the City of Toronto.

Similarly, **Appendix C: Guiding Principles for Trail Design** outlines recommendation for trail design not only for Crothers' Woods but for other trail systems found throughout the City. Recommendations provided pertain to access, signage, surfacing, trail network planning, trail design, safety and risk management, technical trail features and off-leash dogs.







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# *Part I: Background*





## 1.0 Introduction

### 1.1 Study Purpose and Objectives

Crothers' Woods is a natural area park and part of continuous parkland extending through the Don Valley. It serves as both a destination and popular access point to the system. Over the past several decades, an informal network of trails has been created. In Crothers' Woods over 10 km of trails are used by hikers, dog walkers, trail runners and nature enthusiasts. Many of the trails were never actually planned and as a result are unsustainable and are degrading the environment. Heavy use has left many of the trails in poor condition leading to degradation and negative impacts to the natural environment including soil compaction, erosion and damage to the forest habitat.

The purpose of this Trail Management Strategy is to provide the City of Toronto Parks, Forestry and Recreation with a strategy for making improvements in the park to ensure protection, restoration and enhancement of the Crothers' Woods area. The plan includes recommendations for:

- The preservation and protection of existing natural heritage features;
- Creating a safe, logical, sensitive and practical trail system which serves a wide range of user groups;
- Meeting the operational and maintenance requirements of the City of Toronto Parks, Forestry and Recreation Department;
- Improving park users' safety and reducing liability of the City;
- Implementing the various initiatives and improvement proposed as part of this plan;
- Defining a monitoring program as a means to gauge the long term health of

the park ecosystem; and,

- Identifying guiding principles to be applied to other relevant natural areas in the City.

### 1.2 Study Area Context

The Crothers' Woods study area is 52 hectares (128 acres) in size bounded by Pottery Road to the south; Leaside Bridge to the north, the Don River to the east, and the forest edge/top of bank to the west.

To the south and west of the Pottery Road access point, trails lead into the Don Valley Brick Works and the Beltline Trail, which is part of the City of Toronto's formal Discovery Walks trail network. To the south and east access off of Pottery Road leads trail users to Todmorden Mills and to the formal paved Lower Don Trail, which runs the length of the Don Valley from Lake Ontario and the Martin Goodman Waterfront Trail. Access



*Crothers' Woods is part of continuous parkland extending through the Don Valley.*



to the Lower Don Trail is also possible via the snow dump site by crossing the bridge below Sun Valley.

North of Leaside Bridge, the informal trails continue along the west side of the Don Valley, providing access to E.T. Seton Park, and the Lower Don Trail at the “forks” of the Don.

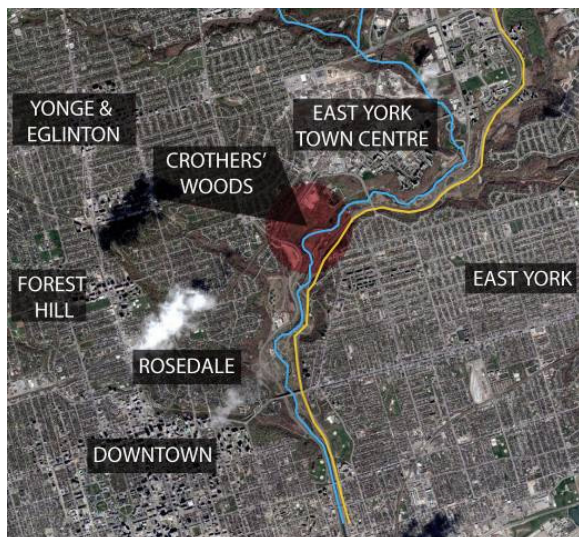
From the “forks”, an established informal trail system runs up the West Don River past Eglinton Avenue and through Sunnybrook Park to at least Glendon College Campus and Edwards Gardens.

A less established informal trail runs from Taylor Creek Park, up the East Don to the Bermondsey landfill site.

### 1.3 Previous Studies

Crothers’ Woods has been the subject site for a number of studies and reports related to natural environment protection, enhancement and restoration. These include:

- *Impact of Mountain Biking Activities in Metro Parks, prepared by Marshall Macklin Monaghan, 1996.*



*Crothers’ Woods is located in close proximity to a number of neighbourhoods and is easily accessible by the paved Lower Don trail.*

- *A Landscape Review and Analysis of the Crothers’ Woods and Beechwood Parklands, prepared by Kirk Biggar & Associates, 2001.*
- *A Landscape Review and Analysis of the Don Parklands from the forks to Beechwood, prepared by Kirk Biggar & Associates, 2002.*
- *Crothers’ Woods – Baseline Inventory Existing Trails and Significant Features, prepared by The Healthy Forest Company Limited, 2004.*

In the mid 1990s, some of the most degraded and damaging trails were closed. However, the program was cancelled soon afterward following amalgamation. In 2004 trail restoration work was undertaken by volunteers including two pilot trail restoration projects by the City of Toronto Parks, Forestry and Recreation Department and the International Mountain Bicycling Association (IMBA). In both 2005 and 2006, IMBA held several public trail workshops, including Beginner, Advanced, and Trail Leader courses.

### 1.4 Legislative/Policy Context

Crothers’ Woods is designated Natural Area Parkland in the Official Plan and is designated an Environmentally Significant Area by Toronto and Region Conservation Authority. For more information on the ESA designation refer to Appendix A.

Currently, no City-wide or site specific trail strategies exist for natural area parkland. There is a great need for a City-wide trails strategy to address the growing number, and use of, informal natural surface trails through ravines and other parkland to balance environmental protection and provide for sustainable recreational use of such public open space.





 Study Area

*The Crothers' Woods study area is 52 hectares (128 acres) in size bounded by Pottery Road to the south; Leaside Bridge to the north, the Don River to the east, and the forest edge/top of bank to the west.*







Crothers' Woods - Key Features

## 2.0 Study Process

### 2.1 Review of Existing Conditions

A review of the study area and its context was conducted over the spring, summer and fall of 2006. This work included:

- Walking of existing trails using a global positioning system (GPS) unit to accurately map the existing trail network in Crothers' Woods;
- Groundtruthing of the various forest communities to assess their health, condition and species composition;
- The use of infrared photography to identify plant species and health to provide direction for more detailed field investigation; and,
- A site review and photographic inventory of existing park features and amenities.

#### *Mapping and Assessment of Trails*

Existing trails were mapped using a handheld GPS unit in March 2006. Updates to the mapping were completed in November 2006 for three areas where re-routes took place in the summer, and for the "flats" (i.e. the trails and pump track between the Don River and the railway tracks).

During the mapping of existing trails, an assessment was made of current trail conditions to determine the need for closure, re-routing and/or improvements to the existing tread in order to develop a sustainable, multi-use trail network.

The following factors\* were visually assessed:

1. Tread slope relative to side slope;
2. Erosion and soil conditions;
3. Tread width;
4. Trail braiding;
5. Tread creep;

6. Water drainage and tread outslope;
7. Safety, including sight lines, trail corridor width, and hazards;
8. Surrounding vegetation and impact on significant features;
9. Flow and efficiency, including speed of trail users;
10. Effectiveness of trail within the context of the larger trail network;
11. Presence of positive and negative control points; and,
12. Aesthetics.

\*Factors affecting trail sustainability and proper design are further outlined in *Trail Solutions – IMBA's guide to building sweet singletrack*, International Mountain Bicycling Association, 2004, and *Natural Surface Trails by Design*, Troy Scott Parker, 2004.

Where re-routing of trails was determined necessary or desirable, new alignments were fire-flagged and mapped using a handheld GPS unit. A maximum accuracy of +/- 3m was possible, with an accuracy of +/- 4m to +/- 6m typically obtained.

In addition to the physical assessment of the trails, social factors identified from input from the Public Consultation session was considered for the development of trail management recommendations.

#### *Ecological Mapping of Communities*

Stereo airphoto coverage in colour (spring 2005; 1:10,000) and in infrared colour (midsummer 2006; 1:6,000), and non-stereo black and white digital orthophotos (spring 2005) were acquired for the valley and environs. Airphoto interpretation provided the foundation for the natural heritage investigation related to vegetation cover, drainage and erosion. The colour infrared photography provided more accuracy and detail (leaf-on coverage) in the delineation of vegetation boundaries than that possible on the colour





photography, and also assisted in identifying locations where high soil moisture conditions were present.

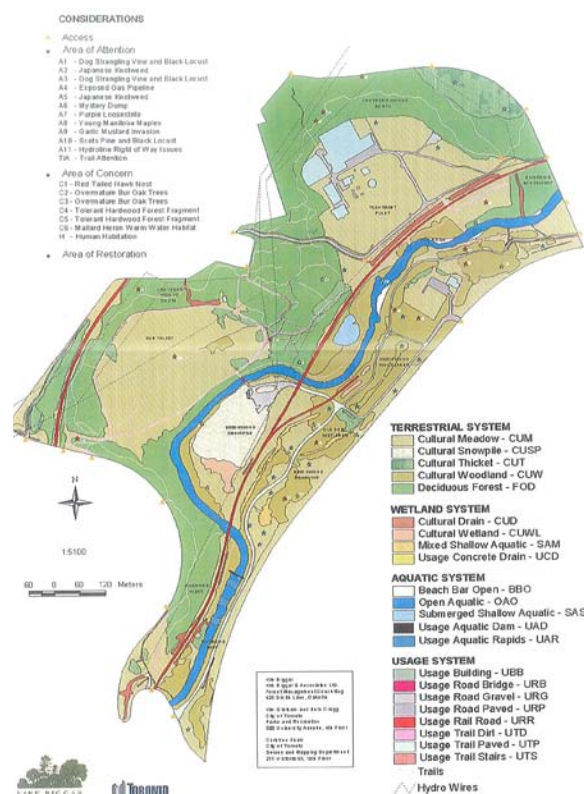
The boundaries of the major vegetation communities were mapped according to physiognomic characteristics. Field investigations were undertaken to confirm and modify the boundaries and to determine species composition. Then the site vegetation cover, namely the natural vegetation communities or features, were characterized, where applicable, using the terminology of the ELC system developed by the MNR (“Ecological Land Classification for Southern Ontario – First Approximation and Its Application”, Lee *et al.* 1998). Additional characterization of the on-site vegetation communities was accomplished through a review of the “Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario” (Bakowsky 1997), specifically with regard to anthropogenic units. The locations of the various vegetation community units are shown on the ELC map. In addition, where possible, note was made of significant infestations of aggressive, invasive alien (adventive, non-native) species, the majority of which are herbaceous. However, because of the season of investigation (fall, 2006), detailed herbaceous inventory was not possible.

The digital orthophotos provided a background for the presentation of natural heritage information. The resulting map is georeferenced (UTM NAD83) and was produced in AutoCAD Map 2004.

Ground photographs were obtained during site walks to illustrate the various cover types and their relationship to existing trails, and some of the more significant infestations of adventives. The ground photos also show some of the impacts that the existing trails have on both terrestrial vegetation and surface water quality (direct and indirect fish habitat) due to soil erosion and siltation of water courses. For a detailed overview of the natural heritage findings refer to Appendix A.



Geospatial Information: 2006 stereo colour infrared photography was interpreted to identify natural heritage community boundaries, to ascertain changes between current conditions and the previously mapped database, and to provide direction for field investigations.



Existing Background Data: Summary level ELC mapping provided an understanding of the range of vegetation communities. Source: A Landscape Review and Analysis of the Crothers' Woods and Beechwood Parklands, prepared by Kirk Biggar & Associates, 2001.





*Comprehensive mapping of the entire valley area in the vicinity was completed. The natural heritage conditions cannot be considered as a 'box', but in the context of the surrounding conditions.*



## 2.2 Public Consultation

### Session #1

On November 20, 2006 an afternoon workshop session was held with 16 invited key stakeholders representing various interest groups. Attendees included representatives from Toronto and Region Conservation Authority, Toronto Field Naturalists, City of Toronto Forestry, University of Toronto Mountain Bike Team, Task Force to Bring Back The Don, and others representing cyclists, dog walkers and trail runners. In the evening an open public workshop was held and attended by over 50 local residents and park users.

During these sessions, a series of questions were posed including:

1. Describe how you use Crothers' Woods: activity, season, number of days a week, and special events.
2. How do you access the park (specific access point location)?
3. What areas of the park do you use most?
4. What features attract you to this area?
5. What do you appreciate about the area?
6. What improvements should be made to the area?
7. How can the community contribute to the park improvements (money, time)?
8. Have you experienced conflict among user groups? If so, which users were involved, and what provoked the conflict?
9. If you do experience conflict in Crothers' Woods, what can be done to reduce such conflicts on site?
10. What are your needs as trail users?

Overall, participants at the workshop recognized the area as a special place within the city and are attracted to the area for a number of various reasons including:

- Accessibility;

- Beauty;
- A high quality natural area within the City;
- Flora and Fauna;
- Quiet and relative lack of people;
- Different levels of trails for exercise;
- Excellent mountain biking trails, reduces the need to drive out of the City;
- Space for dogs off-leash;
- A place for children; and,
- Psychological benefits.

The large majority of those attending the sessions felt Crothers' Woods should continue to be used for cycling and other trail dependent uses and that effort should be made to create a sustainable trail system in the park. The information gathered during the workshops has been used to design the trail system and identify the recommended management approach to the park.

### Session #2

On March 7, 2007, a second public meeting was held. Recommendations for Crothers' Woods were presented and input regarding their priorities for improvements was requested. Public response regarding improvements and management recommendations was generally positive. One request made by those in attendance was regarding the "flats." It was suggested that recommendations regarding providing a safe access route to the "flats" be investigated and that it not be closed to public use.



## 3.0 Current Park Use

### 3.1 Access

Of the ten access points to the Crother's Woods trail system, only the access point at the bottom of Redway Road could be considered a City sanctioned park entrance. The ten access points identified include:

1. Pottery Road and Bayview Avenue;
2. 91 Bayview Ave south of train tracks;
3. Bayview Ave between the train tracks at Nesbitt Drive;
4. From Beechwood Drive and Lower Don Trail via snow dump site at river crossing;
5. Loblaws parking lot (Redway Road location);
6. North side of Redway Road between Loblaws and North Toronto Sewage Treatment Plant (NTSTP);
7. South side of Redway Road between Loblaws and NTSTP;
8. Bottom of Redway Road, near access to NTSTP;
9. Staircase from Redway Road to North Toronto Treatment Plant; and,
10. NTSTP service access road below Leaside Bridge.

West of the CN/Go rail line, access to the "flats" is gained in the following ways:

- A) From the south by crossing over or under the tracks at the train bridge at the north end of the snow dump site;
- B) By crossing the rail line through the chain link fencing at at least two locations near the bottom of Redway Road;
- C) By crossing the rail line near the Leaside Bridge; and,
- D) From the north by crossing the rail line at the East Don and main Don River junction.

### 3.2 Cycling

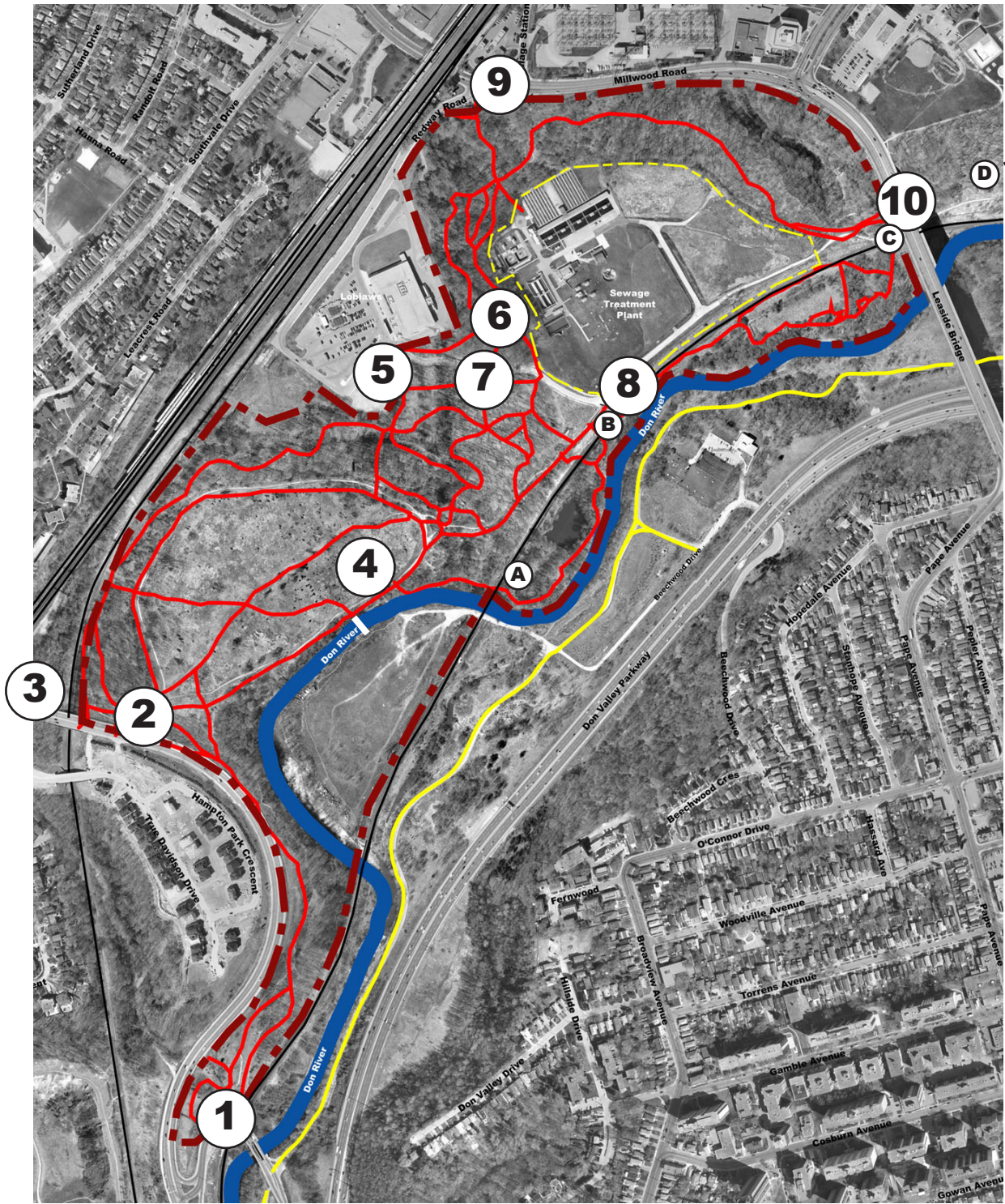
Although comprehensive scientific surveys of trail users have not been undertaken, casual observations, the authors' extensive experience on the trails and working with trails users, and the input from the Public Consultation session have been used to develop summaries of the types of cyclists using Crothers' Woods.

In 2004, the Cycling Ambassadors program did informal surveys of Crothers' Woods trail users from the Loblaws parking lot access point, as part of OASIS (Off-road Awareness Safety Information Stop) information events. The OASIS events in Crothers' Woods were held to promote trail etiquette, provide information on trail sustainability and to assess the numbers and types of people using the trails. During the six OASIS events that were held in 2004 in Crothers' Woods the following key observations were made:

- 277 cyclists and 25 pedestrians were observed;
- The majority of pedestrians were dog walkers;
- Over 60% of cyclists contacted use Crothers' Woods weekly; and,
- Most cyclists wore helmets and many were aware of basic trail etiquette.

Anecdotal observations indicate that cyclists, particularly mountain bikers, are the predominant user group of the Don Valley trails, including those within Crothers' Woods. Cyclists can be further sub-divided into a number of different categories. It should be recognized that the types of skills required, equipment (bikes) used, expectations and type of trail experience desired varies with each user group.





Existing access points to Crothers' Woods.





Various forms of mountain biking take place in Crothers' Woods.

### *Cross-Country Mountain Bikers*

Cross-country (XC) riders use trails for recreational enjoyment and for exercise. Riders may use trails several times a week. Tight technical trails with challenging sections are desirable for variety of terrain and physical challenge. Beginner to expert cross-country riders use the Crothers' Woods trails, including competitive level riders who use the Don Valley as training grounds (e.g. University of Toronto Mountain Bike Team). More experienced riders will carry water, food, tools and repair kits. As skills and endurance develops, longer trails are sought. Cross country riders do not tend to stick to the Crothers' Woods trails, rather they may use some additional sections or the whole Don trail network as part of their route.

### *Dirt Jumpers*

Currently, a specific site within the study area is a destination for dirt jumpers. Over the last decade dirt jumps have been excavated between the Don River and the train tracks, just upstream from the train bridge north of the snow dump site. However, since the flood damage of August 2005, the area has been reconstructed to include a pump track and dirt jumps.

This area is frequented by relatively younger riders interested in developing dirt jump and pump track skills. Users will typically stay in this area, using trails simply to access the site.

### *Freeriders*

Freeriding as a type of mountain biking originates from the North Shore region in B.C., where mountain bikers started elevating trails above the saturated ground to stay out of water and mud. The structures built such as boardwalks, evolved to incorporate purposefully built technical challenges such as elevated ladder bridges, drop-offs, skinnies, teeter totters, etc. These man-made structures are considered a type of "technical trail



feature” (TTF).

In Crothers’ Woods, cyclists seeking this type of experience are constructing structures along existing trails, or off the trails in hidden areas. Similar to XC riders, freeriders may desire a long trail ride with these features incorporated into or alongside the trail, as an optional experience. Alternatively, similar to dirt jumpers, freeriders may focus their time on one specific area and ‘session’, or repeatedly ride features, in order to develop skills.

The installation of man made structures is of concern for land managers due to the impact on the natural environment and the safety of users riding unauthorized and potentially poorly constructed or un-maintained structures. The liability of these structures is therefore a common concern for public land managers, and a motivating factor for land managers to work collaboratively with mountain bikers to address unauthorized building.

### **Downhillers**

Downhillers seek long challenging descents and are typically not using the Crothers’ Woods trails. Designated areas such as Blue Mountain Resort in Collingwood with lift access to downhill trails are designed specifically to attract downhillers. However, short steep sections of fall-line trail found throughout the Don Valley could be considered desirable to downhillers.

### **Recreational Cyclists**

Beginner mountain bikers, families with members having varying skill levels and infrequent casual trail users may be considered recreational cyclists. Skill level is generally lower than the above categories and length of trail covered and amount of time on the trails may thus be shorter. The Crothers’ Woods trails are considered to be relatively technical and challenging, and therefore

may be intimidating to beginner cyclists. However, on several occasions, individuals have indicated that they have been riding the trails for twenty years and are now bringing their children to Crothers’ Woods to learn to mountain bike.

### **Commuter Cyclists**

The Don Valley is a corridor for recreational as well as commuter cyclists. A small number of cyclists may use the Crothers’ Woods trails as part of a commuter route or transportation corridor to and from downtown Toronto. Hybrid or mountain bikes, rather than road bikes would be required for such commutes due to the trail conditions. (source: pub. Consult/John Routh).

## **3.3 Trail Running**

Trail runners use the Crothers’ Woods trails for exercise on natural surface trails, rather than paved trails or streets. Use patterns and motivations are suspected to be similar to those of cross-country mountain bikers, i.e. endurance and technical challenges. The types of recent trail improvements completed by the City of Toronto in partnership with volunteers, primarily mountain bikers, are supported by trail runners.

SaltyDog Trail Running is a G.T.A. based trail running club that promotes and organizes group trail runs in the Don Valley, identifying the Don Valley Brick Works and Sunnybrook Park as access points (GetOutThere Magazine, September/October 2006). The club has also hosted a Don Valley Trail Running Clinic and has featured the City of Toronto’s Sustainable Trails Initiative in a recent newsletter (SaltyDog Newsletter, Spring 2006 Issue).

## **3.4 Nature Appreciation**

Nature appreciation is a popular and growing recreational pastime. The Don Valley system provides an excellent opportunity for nature





*Rail lines border the site on the west and east.*



*Numerous hydro corridors pass through Crothers' Woods.*



*The North Toronto Sewage Treatment Plant is located at the centre of Crothers' Woods.*

lovers to experience nature in the city and undertake activities such as bird watching, hiking and nature photography. Within the valley it is not uncommon to encounter various bird species not typically found elsewhere in the City. Larger mammals such as deer, fox and coyote can also be viewed in the Don Valley.

### 3.5 Dog Walking

As is typically the case with most City of Toronto parks, dog walking is a popular pastime in Crothers' Woods. Not only is dog walking popular in Crothers' Woods by individuals but it is also a destination for professional dog walkers who may walk large numbers of dogs at one time.

### 3.6 Utilities, Transportation and Infrastructure

Crother's Woods serves various City infrastructure functions as well. This includes hydro corridors (hydro wires and towers) and railway corridors with Go Train and CN lines along the eastern and western boundary including a signalized level crossing at the site's eastern boundary.

At the north end of the park is the North Toronto Sewage Treatment Plant (NTSTP). The plant is secured by a chain link fence and has a number of service connections to it through the valley. A sanitary line connection through a portion of Crothers' Woods is also scheduled for installation this year to service the new residential enclave on True Davidson Drive and Hampton Park Crescent southwest of the park.

The area east of the Don River, inside the study area is also designated as a municipal snow dump to be used in extreme conditions as a last resort. In addition to being disturbed as a result of past snow dump activity, the western edge along the River contains various piles of concrete debris.



## 4.0 Scenic, Recreational & Biophysical Resources

### 4.1 Scenic Resources

Crothers' Woods represents a significant visual and scenic resource within the City. Views within the valley and from the surrounding community into the valley are a special feature which should be protected and enhanced wherever possible. Views of the river, forested slopes, fields and downtown, all contribute to the unique character of Crothers' Woods.

However, a number of uses within the park detract from the quality of the views and scenic character. The North Toronto Sewage Treatment Plant and hydro corridor are two such features. Further, in connection with these utilities, a number of satellite structures are found scattered throughout the park.

### 4.2 Recreational Resources

Almost ten kilometres of natural surface trails exist in Crothers' Woods. These trails provide excellent mountain biking throughout the valley and provide connections to the adjoining parkland north and south of the park. Trail widths vary from narrow (<0.5m) to wide (approximately >2.0m). Wider trails are generally associated with steep, fall-line sections of trail where erosion is forcing users to move out of rutted or wet areas. Similarly off-camber trails which slope away from the inside of the turn and lack a proper bench cut tread, even if along the contour of a slope, are often wider, due to sliding of users downhill when traction is limited. Wider trails, and disturbance to ground cover or understorey vegetation are also associated with areas where structures or dirt jumps have been built.

The multi-use trail network is used regularly through the spring, summer and fall seasons, with less use during the winter months and when trails are ice-covered. Public consultation participants indicated typical use is weekly to daily. Limited trail use does occur in the winter, including mountain bike use.

Muddy conditions may deter some use while efforts are made by some mountain bikers to encourage responsible riding by staying off the trails when wet, to protect the trails from rutting and erosion.

### 4.3 Biophysical Resources

The topography of Crothers' Woods influences the distribution of vegetative cover. Generally the steeper slopes have been left in a forested state while the flatter areas have been cleared for other uses. Twenty-two different vegetation communities were identified as part of the site inventory and analysis. The majority of the site is cultural (meadow, plantation, thicket and woodland), with the steeper slopes forest (dry-fresh sugar maple). Only a small percentage of the site is marsh or pond. For a more detailed overview of the site's natural features please refer to Appendix A.



*Crothers' Woods offers spectacular views of the surrounding city.*



## 5.0 Current Management Issues

The primary issues that must be addressed by this management master plan include the following:

### 5.1 Safety, Security and By-law Enforcement

Park user safety and security is the primary concern for the City. Some key recommendations that should be considered include:

#### *Warning Signage*

As the Land Manager of Crothers' Woods, the City should erect signage to warn visitors regarding the inherent risks of using the trails in the park. With signs posted at the various entrances to the park, park users will then assume the risk of entry and use of the trails.

#### *Illegal Crossing of Railway Corridors*

In this section of the Don Valley, active rail lines can be found on both the east and west sides of Crothers' Woods. Currently some park users repeatedly cross the tracks to gain access to various parts of the park and in particular the "flats" dirt jumps area. In other locations cyclists and hikers cross the tracks either because it allows for direct access to a particular destination or because it provides an open route for travel. Not only is this practice dangerous, as has recently been illustrated by a pedestrian being hit by train in 2006, but it is also unlawful to cross the tracks.

#### *Unauthorized trail features*

Unauthorized building of technical trail features (TTFs) and dirt jumps in the forest for mountain biking present management and liability issues for



*The number of signs warning cyclists of the dangers associated with trail riding need to be increased.*



*Illegal crossing of the rail corridor is dangerous and should be prevented where possible.*



*The building of unauthorized trail features is prevalent in the "flats" located between the rail corridor and the Don River in Crothers' Woods.*



the City of Toronto. Attempts to remove structures without providing an authorized designated area for the type of use and education regarding impacts of the building may only displace the building of such structures. The presence of these structures and ongoing building of dirt jumps demonstrates the need for a City sanctioned mountain bike skills park in the area. Liability and park user safety concerns are also issues that must involve the City's Legal department.

### *Homeless Encampments*

Camping in the Don Valley park system is an ongoing concern for the City. A By-law was passed by Council in 2006 banning sleeping in parks and other public spaces. However, encampments are still an occurrence in many of the Don Valley parks including Crothers' Woods. Camps are a safety concern to the City due to the unsafe living conditions they provide for inhabitants. In some instances the encampments are susceptible to extreme weather events such as flooding putting people at risk. In addition, encampments create environmental impacts as a result of soil compaction, improper disposal of human waste, and damage to vegetation.



*A number of homeless encampments are found throughout Crothers' Woods.*

### *Off-Leash dogs*

Like other City of Toronto parks, dog walking is a popular activity in Crothers' Woods. Currently dog walking in Crothers' Woods is on-leash only. However, a number of park users have identified that off-leash dogs on the trails are a concern as conflicts can often arise between cyclists and dogs who are not under the control of their owner. In addition, the impacts of dogs such as disturbing wildlife, holes from digging, waste on the trail and overflowing waste receptacles in the park have been identified as concerns.



## 5.2 Erosion of Trails

Many of the trails in Crothers' Woods were never properly designed or constructed as multi-use recreational trails. In many cases the trails represent desire lines between points which fail to respect the vegetation, soils or topography of the site. As a result sections of trail:

- Do not drain properly;
- Impact vegetation and tree roots;
- Crisscross one another increasingly fragmenting habitat; and,
- Run directly up/down the fall line of slopes making the trail difficult to negotiate and highly susceptible to erosion.

The trail network in Crothers' Woods needs to be designed to reflect the specific conditions of the park to provide a sustainable system of trails.



## 5.3 User Conflicts

Trails are used by a wide range of user groups including hikers, cyclists, dog walkers and trail runners. In some locations the trail tread is quite narrow (under 600mm wide) creating a conflict when two users need to pass one another. In some areas visibility needs to be improved to reduce conflicts and allow for different groups to see one another in advance. Signage/education regarding proper trail etiquette and who has the right of way is also not posted leaving many novice trail users unaware of who has the right of way in different instances. In addition, off-leash dogs that are not under the control of their owner have also been identified as a concern.



*Soil erosion from improper trail design.*

## 5.4 Access

Currently the park can be accessed from various locations around the perimeter of the park. However, only a few of these access points to the park are signed or are officially designated/



sanctioned by the City of Toronto. In some instances, such as the access points off of Bayview Avenue and Pottery Road, there are safety concerns in regards to sightlines for cars accessing the informal parking areas. In the case of the access point at Redway Road at the Loblaws parking lot, the parking is on private property and access to the park is through a hole cut in the fence. However, an agreement has been recently reached with Loblaws to officially designate this as an official trailhead. A plan for park trailheads needs to be established.



Pottery Road access point.

## 5.5 Signage, Wayfinding and Interpretation

Signage in the park is limited. Some old Metro Parks signs still exist, although they are in poor condition and outdated. Mapping and directional signage typically found in other City of Toronto Parks is not provided. This makes it difficult for users to navigate through the park if they are not familiar with the area. Some signage regarding trail closures, ongoing restoration initiatives and interpretation do exist. This program should continue and be expanded as required as new park and trail management initiatives are implemented.



Loblaws at Redway Road access point.



Old Metro Parks & Culture sign.



## 6.0 Current Management Initiatives

Beginning in 2004, the City of Toronto enlisted the support of the International Mountain Bicycling Association (IMBA) to help address requests from mountain bikers to work with the City to undertake trail improvements. IMBA has led trail building workshops with City and TRCA staff and volunteer trail users to provide education on sustainable trail building and design theory as well as practical hands on skills development. IMBA also plays a critical role to build relationships between mountain bikers and land managers.

Since the initial IMBA workshop in 2004 the Natural Environment and Community Programs Section has run evening and weekend volunteer trail stewardship sessions involving a variety of trail users. Attention has been focused on priority problem areas that are easily accessible and manageable for a volunteer group.

### 6.1 City Recognition of trail use as valid activity meeting mandate of Parks, Forestry and Recreation

The City recognizes and encourages trail activities. The Discovery Walk Program is a key example of how the City of Toronto has encouraged public use of these trails, including natural surface trails. Since 2004, the City has implemented official trail projects on more informal trails, and engaged the public, community groups, and corporate partners in their implementation. In 2006, a Toronto Trails website and hotline were established, and in 2007 a brochure to promote the Toronto Trails program was established. At this point in time, it is essential that the City develop a signage program in order to limit use of unsafe trails, and develop a trails strategy to establish a future consistent approach to the management of Toronto's informal trail systems.

### 6.2 Trailhead signage / Loblaws TrailHead

The trailhead for Loblaws has been approved by both Loblaws and an easement passed by City Council. A reference plan has been completed, which will be registered shortly. Funding has been secured by both the City and Loblaws. The easement agreement has to be written and approved by both parties, and then the building can start.

### 6.3 Invasive Species Management

The City of Toronto has a seasonal Ravine Management Crew responsible for invasive species control. They work in conjunction with the Natural Environment Planners, Forestry Planners, Councillors' offices, Park Supervisors, and other relevant stakeholders.

### 6.4 Habitat Restoration

Habitat restoration activities have taken place at various locations throughout Crothers' Woods. Thousands of trees and shrubs have been planted in Sun Valley. Tree, shrub and herbaceous planting events are held each year in the forest, in conjunction with a trail work session, or previous trail initiatives. In addition, bird boxes have been installed around Sun Valley.



*Bird box in Crothers' Woods.*



## 6.5 Trail Ambassador Program

In 2006, the Toronto Trails Program partnered with the Cycling Ambassador Program to hire two Trail Ambassadors. Although they were part of the seasonal Cycling Ambassador team, they had specific responsibilities related to natural surface, single-track trails. They completed trail assessments in the Don and Etobicoke Creek trails, they spoke with trail users about safety and trail etiquette, and presented workshops to camp children on safe cycling and sustainable trail use. This program was successful, however the Cycling Ambassador Program will not be continuing in 2007, and therefore neither will the Trail Ambassadors.



*Trail work with Cycling Ambassadors.*

## 6.6 Community Engagement and Education

Community engagement is critical to the success of the management of Crothers' Woods. Members of the public, trail users, corporate groups, and community organizations have all been engaged in planting events, trail maintenance, and larger trail initiatives. These events have been very successful, and there has been positive feedback from all groups involved.



*Trail stewards benchcutting a new trail.*



*Group photo of IMBA Trail Care Crew.*





# *Part 2: Recommendations*







An array of challenges face the City in the management of Crother’s Woods to ensure the park is safe and its users do not exert undue harm to the park’s environment. Many of these challenges can be managed through education and by-law enforcement, while others must be addressed through design and capital improvements.

## 8.0 Natural Areas Management

### 8.1 Management Zones

Three management zones have been identified for Crother’s Woods based on sensitivity of the landscape to human use. These zones were determined based on topography and habitat type and were identified by overlaying topography with the ecological land classification mapping.

In Crothers’ Woods, the steep slopes are considered priority for protection due to the potential for erosion and sediment transport through heavy use. The sugar maple forests are considered priority for protection since they represent one of the few landscapes in the park which was not previously cleared or significantly altered due to development.

Where the most sensitive slopes (over 15%) and forest landscape habitat (sugar maple forests) intersect, these areas are the most sensitive to impact. The remaining areas with slopes over 15%, remaining sugar maple forests, and marsh and pond areas in Crothers’ Woods are identified as medium sensitivity. While all remaining areas (slopes under 15% with a vegetative cover which is not sugar maple forest) is considered low sensitivity.

The resulting management zone map should be used as a tool in the planning of the trail system in Crothers’ Woods and will help inform park managers as to where special considerations need to be made in regards to trail layout and detailed design.

### High Sensitivity Areas

Trails in the High Sensitivity Areas of the park need to be contoured trails and must work with existing grades as much as possible to minimize impact to tree roots. Tree roots in this zone should be protected wherever possible with minimal regrading around trees. The trail route should be selected to avoid regrading around large healthy trees while looking for gaps in the forest. Understorey planting should be undertaken in conjunction with the trail building in these areas to help regenerate the forest and stabilize the soil. On-going monitoring and management of these areas will be required to ensure the trails continue to function properly and are not inflicting undue harm to the natural environment.

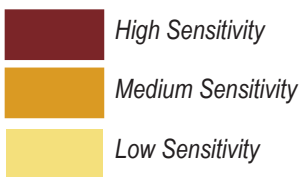
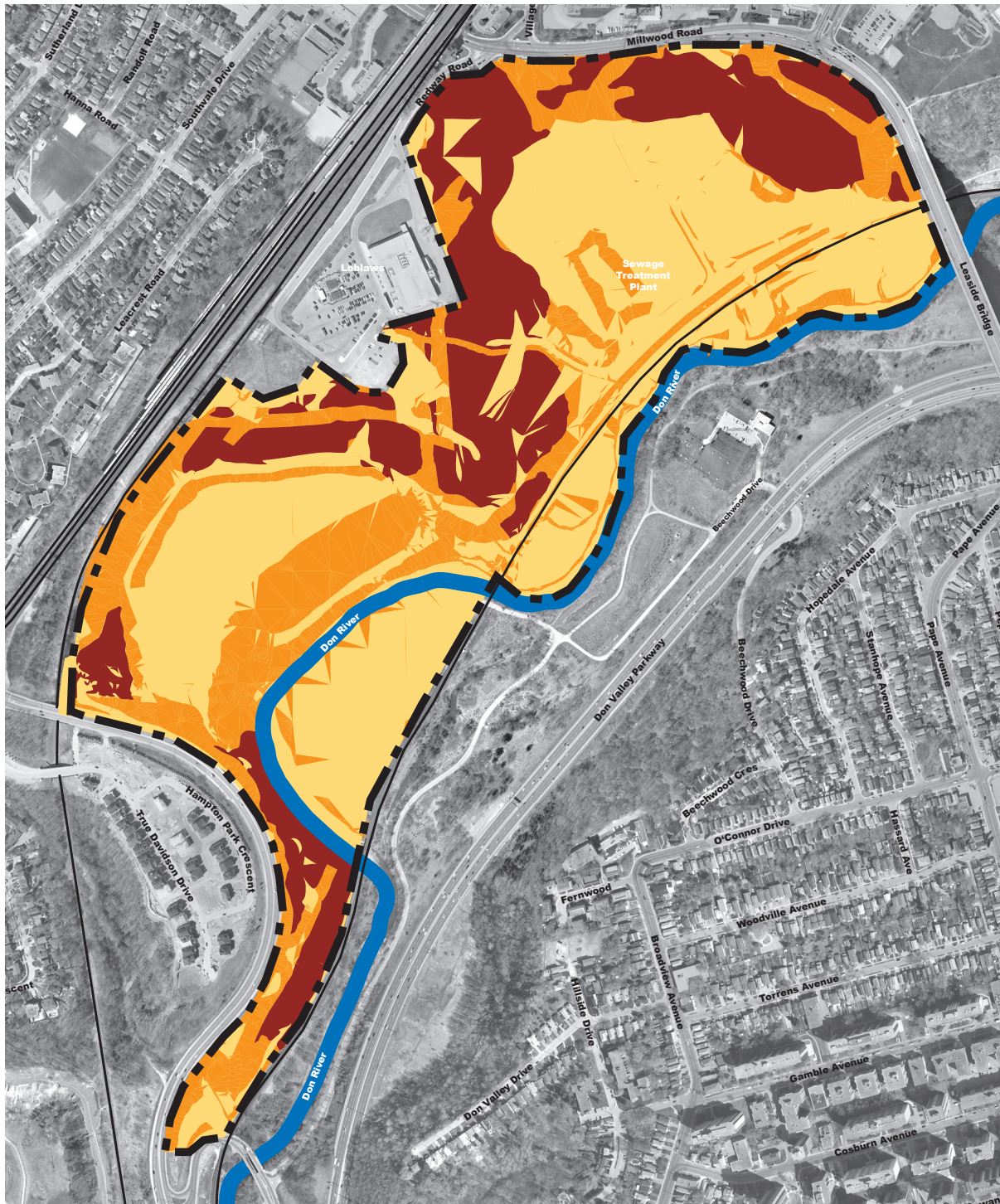
### Medium Sensitivity Areas

These areas are less restrictive to trail layout and design. Although steep slopes or deciduous forest may be present, this zone does not contain both in the same location. Where steep slopes are present contoured trail should be used. Tree roots within the deciduous forest areas should be avoided or protected. Where wet areas such as marshes, ponds, seeps and drainage course should be avoided if possible. Where they are unavoidable, structures should be built to facilitate travel over these wet areas.



*Trail in hardwood bush (FOD5-2), showing attempts to protect compacted tree roots and harden the tread with a layer of cobble-sized limestone, and gravel. Roots are protected from further damage by trail users, but may be susceptible to abrasion by the angular cobbles.*





Management Zones for Crothers' Woods.



### Low Sensitivity Areas

Trail layout and design in these areas has the fewest obstacles to overcome. The habitat in these areas can withstand a fair amount of use, while the slopes are more conducive to trail building. Fewer trail structures or earth works (bridges, root barriers, bench cuts) will be required in these areas.

## 8.2 Invasive Species Management

Invasive species management should be conducted in concert with trail building and management wherever possible. For example in conjunction with a trail closure or re-routing, or a part of a trail building exercise. Individuals involved in trail building and use in Crothers’ Woods should be educated regarding invasive species and their identification, as well as in the manual removal of plants. As a result individuals and groups could participate in invasive species control using manual methods, with the chemical methods left to the agencies. These same individuals should also be involved in habitat restoration planting since bare ground is an invitation to adventive invasives. In some cases it may be necessary to plant a nurse species to discourage the reintroduction of invasives.

The removal of invasives and restoration of areas is especially important where new trails are proposed since introducing a new trail through invasives will make the trail users unintentional transporters of invasives causing their spread and establishment throughout the length of the trail. For additional information regarding Invasive Species Management refer to Part III of this document.



*This type of disturbed area is in the medium sensitivity zone. With its steep, irregular topography, coupled with cultural rather than natural vegetation, presents an opportunity for concentrated trail development with minimal additional impact on natural heritage features.*



### 8.3 Habitat Restoration

For Crothers' Woods, habitat restoration should be focussed at two scales:

- Small, isolated areas of restoration tied to endeavours such as closing trails or treatment of locations for invasive species
- Larger areas of restoration to diversify and enhance the Crothers' Woods system

For the small areas, the plan for the restoration area should be in keeping with the immediate environs. For example, if the vicinity is wooded, then the species, planting techniques and management techniques should relate to forestry restoration. Or, if the location has been identified as a meadow that should persist, then suitable forb and graminoid species should be the focus of the planting plan.

- The woodland vegetation unit types could be expanded into much of the areas that currently are cultural meadows.
- Tree and shrub species should be chosen from the City of Toronto native tree and shrub species lists and acquired from native stock sources. As Crothers' Woods is within the Carolinian zone, the planting plans should include a high percentage of species restricted to this area. The species mix should reflect the forest type that currently exists, with its domination by sugar maple, beech, and red oak. However, Carolinian species should be added, but should include only those native Carolinian species indigenous to the area.
- Additional habitat diversity should be encouraged by expanding and improving upon the wetland communities on the valley floor and in the vicinity of the river, or where seeps may be identified adjacent



*Flat tableland traversed by a narrow dirt path, within old field habitat (CUM1-1), with adventives of teasel, common burdock and Canada thistle (*Cirsium arvense*) adjacent to a copse of black locust (*Robinia pseudo-acacia*) with a groundcover of dames rocket (*Hesperis matronalis*). Erosion is not an issue, but control of advents is.*



*Trail with mainly foot traffic along top of slope within a narrow strip of staghorn sumac cultural thicket (CUT1-1) and a groundcover dog-strangling vine (*Cynanchum rossicum*).*



*View of typical invasives, common burdock (*Arctium minus*) in combination with dog-strangling vine, along edge of dirt trail through cultural woodland stand (CUW1-A2).*

to valley walls (MAM, MAS), or where ponding exists in former channels.

- Where there is a likelihood that adventive species will invade, it may be necessary to plant a ground cover nurse species while the other specimens mature.
- Locally sourced native plants should be used.
- Appropriate monitoring of the planted materials should occur, including watering, until the specimens are well established.
- Additional features can be added throughout the valley to enhance wildlife habitat, including boulder trains and log piles.

### Restoration of the “flats”

The area located between the Don River and the railway tracks in Crothers’ Woods has been significantly impacted by stunt and jump building in this area. These user activities – coupled with the fact that the area floods regularly and receives new layers of silty alluvial material each flood event – make it difficult to restore. Therefore, the following approach is proposed as a guide and should be adjusted as necessary as the area is monitored and successful practices are identified:

- Scarify the soil wherever it has become compacted;
- In the vicinity of channel areas, plant with live stakes of willow and dogwood species (indigenous in vicinity or *Salix bebbiana*, *S. candida*, *S. discolor*, *S. exigua*, *S. petiolaris*; *Cornus alternifolia*, *C. racemosa*);
- In flat areas removed from direct overland

flow potential to river, apply Standard Riparian Seed Mix (Pickseed, 'Native Pro', wet native grass mixture; 20% of each of *Spartina pectinata*, *Camamagrotis canadensis*, *Panicum virgatum*, *Elymus riparius*, *Glyceria striata*) (best success would occur if area surrounded with silt fencing and topsoil applied to a depth of 20-30 cm);

- Ground cover should be watered immediately after seeding and kept moist during germination period; reseed any areas that fail to germinate after two weeks;
- Plant seeded area with shrubs and trees; shrub specimens should be planted at one metre on centre spacing and tree specimens should be planted at five metres on centre spacing;
  - trees should be whips;
  - tree and shrub species should be native and indigenous to area;
  - tree species that may grow successfully in the area: *Acer saccharinum*, *A. rubrum*, *Fraxinus pennsylvanica*, *Quercus macrocarpa*, *Alnus rugosa*;
  - shrub species: *Cephalanthus occidentalis*, *Corylus cornuta*, *Dirca palustris*, *Lindera benzoin*, *Myrica gale*, *Rosa palustris*, and willow and dogwood species mentioned above;
- Best success would occur if mulch was applied around base of trees and shrubs - but should only occur in flat areas where runoff to river would not occur and/or where sediment control established;
- May be necessary to protect growth





from rodents and rabbits with protective collars;

- Deer may reduce success of growth substantially.

Because of location, wildlife, difficulty of watering and monitoring, frequent replanting with willows and dogwoods may be most cost effective.



*The "flats" area located between the Don River and the railway tracks in Crothers' Woods has been significantly impacted by stunt and jump building in this area.*

## 9.0 Trailheads & Access

Approval for a primary trailhead at the Loblaws on Redway Road has been given by Loblaws and City Council and a formal agreement is in process. However, additional primary and secondary access points need to be established for Crothers' Woods. These trailheads will act as staging areas for park users. They should be clearly signed identifying the name of the access point, provide explicit warnings in regards to user safety and liability, provide a map, indicate rules and regulations, outline trail etiquette, and provide trash and recycling receptacles. They may also provide benches or rest areas for park users and incorporate some landscaping. These access points should be identified on City trail and bike maps as the entrance points to the park. All other currently existing access points, which are not identified as trailheads, are to be closed-off from public access.

### 9.1 Primary Trailheads

Three primary trailheads are identified: Loblaws, Redway Road and Pottery Road.

#### *Loblaws (at Redway Road)*

Approval for a formalized trailhead at the southern corner of the grocery store's parking lot on Redway Road has been given by Loblaws and City Council. Plans for the trailhead are already complete which includes:

- Signage at the entrance to the trail (including information regarding safety/liability);
- Entrance improvements (currently a hole cut in a chainlink fence);
- Surface improvements at entrance (currently lawn);

- Information kiosk (trail map, rules and regulations, trail etiquette and notice board); and,
- Trash and recycling receptacles.

#### *Pottery Road*

Currently the Pottery Road access involves potentially hazardous vehicular access to the informal lot under a hydro right-of-way. It is also in close proximity to the rail line and Cudmore Creek which runs into the Don River. Given the popularity of this access point and the existing disturbed conditions, efforts should be made with the appropriate stakeholders to establish a parking lot at this location with design for safe vehicular, pedestrian and bike access. An information kiosk (safety/liability information, trail map, rules and regulations, trail etiquette and notice board) should be provided.

If safe access to this proposed primary trailhead is not possible, consideration should be given to establishing a primary trailhead for the Crothers' trails from the Don Valley Brick Works (DVBW) and establishing a designated dirt trail from the DVBW to the Pottery Road trail access, including safe crossing of Bayview Avenue and Pottery Road.



*Plans for a trailhead at the southern corner of the Loblaws parking lot are underway following permission from Loblaws and City Council.*



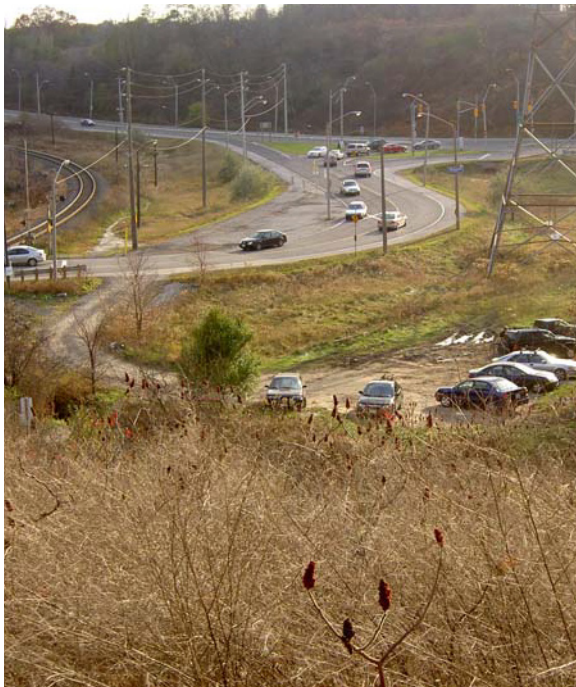


## Redway Road

At the bottom of the hill on Redway Road, a small trailhead exists. This trailhead should be enhanced to include a small trail kiosk. Opportunities to enhance parking should be considered and trash and garbage receptacles should continue to be provided with regularly scheduled pick-up. To help minimize vehicular/pedestrian conflicts on Redway Road, opportunities for traffic calming including warning signs regarding pedestrian activity should be provided.

## 9.2 Secondary Trailheads

Secondary trailheads are to be pedestrian and cyclist designated access points to the park. No parking is to be provided. Three secondary trailheads are identified: Bayview Avenue, Beechwood and the staircase at Redway Road.



Improvements are required at the pottery road entrance to make it a suitable trailhead for Crothers' Woods.

## Bayview Avenue

The Bayview trailhead is currently a service access point to the park and informally provides space for only a few cars to park. However, due to space restrictions and visibility, it is unsafe to allow parking. Therefore, this area should be redesigned to prevent cars from pulling into the area and no parking signs should be provided and enforced. At the entrance to the trails an information kiosk (trail map, rules and regulations, trail etiquette and notice board) should be provided along with trash and recycling containers for users arriving on foot or by bike.

## Beechwood

At the intersection of the Don River trail and Beechwood a trail kiosk should be provided to intercept park users from the Don River Trail.



The access point at 91 Bayview Avenue informally provides parking for park visitors. Restricting parking in this area should be reviewed to improve safety.

### Stairs at Redway Road

The stairs at Redway Road were once used to provide direct access to school groups to the sewage treatment plant. The stairs are no longer used for this purpose however staff still use the staircase and it provides an alternative access route in an emergency. It is recommended that the stairs be routinely inspected and repaired as required to ensure they remain safe to use.



### 9.3 Closures

The following access points to the park should be closed once trail improvements are in place to relieve pressure on these locations:

#### Bayview (north of train tracks)

Current access point off of Bayview Avenue north of the train tracks should be closed to access, except for rail service vehicles. The access point is unsafe and should be discouraged from use. Consultation with rail companies is required prior to closure.



#### Monitoring of informal access point.

It is recommended that staff monitor the creation of any access routes to Crother's Woods. Should new access points be created, they should be closed as soon as possible. Brush barriers should be used to disguise informal entrances. Should access at these points persist, staff should investigate the feasibility of formalizing the access route.



## 10.0 Trail Design and Management

### 10.1 Design Guidelines

Trail design and management in natural areas such as Crothers' Woods must address the need and demand for sustainability in order to achieve a balance of providing recreational opportunities while protecting the natural environment.

Secondary Access Points (From top to bottom) Redway Road, Leaside Bridge and staircase at Redway Road.





Multi-use recreational trails can be designed to be environmentally and socially sustainable. A sustainable trail may be defined as a trail that has minimal negative impact on the natural environment, requires little maintenance, meets the needs of the users and minimizes conflict between different user group (IMBA, 2004).

The development of a sustainable trail network must therefore address the physical impact and design of a trail, as well as the “why, who and what” of how the trail is used. Understanding these elements is critical to successfully designing a sustainable trail network.

The following key questions must be answered to ensure the design of the trail network meets the demand of its users:

- “Why is this trail needed?”
- “Who will use the trail?”
- “What kinds of experiences are we trying to create?” (IMBA 2004)

In brief, based on visual assessments of the current trail conditions, and input from the public consultation sessions, these questions may be answered for the Crothers’ Woods trail network as follows:

“Why is this trail needed?”

- To provide access to public natural environment parkland for recreation and nature appreciation while minimizing negative impact to the natural environment.

“Who will use the trail?”

- Multiple users. Primary users are mountain bikers, hikers, on-leash dog walkers, commuters, wildlife;
- People of all ages and levels of fitness; and,

- Accessibility – highly accessible although limited access to wheelchairs depending on individual ability and equipment.

“What kinds of experiences are we trying to create?”

- Beautiful natural setting;
- Quiet and solitude;
- Exposure to, and appreciation of flora, fauna, geological features;
- Educational opportunities through interpretive signage, guided hikes, and other programs;
- Accessible nature in the middle of the City;
- Exercise and physical challenges; and,
- Continuous and varied trail network.

Factors affecting trail design and management:

- Location of trailheads and access;
- Stacked loops/circulation;
- Directionality;
- Users groups and multiple use trails;
- Tread width;
- Tread surfacing;
- Drainage features;
- Water crossings;
- Vegetation management zones;
- Natural environment feature protection and restoration;
- Use of gateways, control points, anchors, flow; and,
- Filters and other safety considerations.

A variety of resources provide guidelines for sustainable multi-use natural surface trail design and management, including “*Trail Solutions*



– *IMBA’s guide to building sweet singletrack*”, International Mountain Bicycling Association, 2004; *Natural Surface Trails by Design*, Troy Scott Parker, 2004; and *“Managing Mountain Biking”* – International Mountain Bicycling Association, 2007.

## 10.2 Trail Construction Standards

Although beyond the scope of this trail management strategy, detailed trail construction standards are often developed for land managers responsible for the development, maintenance or inspection of trails. Developing trail construction standards for Crothers’ Woods and the associated Don Valley Trails, or potentially all trails found throughout Toronto’s natural environment parkland, is identified and recommended as a short term priority.

Detailed trail construction standards have been developed for the Regional Municipality of Whistler, B.C., which has set the standard for other trail networks throughout Canada and the United States. Similarly, trail construction standards for Surrey, B.C. may also serve as a model for Toronto’s trail networks.

Trail construction standards should be developed in partnership with trail users, other external stakeholders, and relevant internal departments in addition to NECP, such as legal services, Parks operations, by-law enforcement, recreation, forestry, as well as the TRCA.

## 10.3 Trail Types

Most of users of the trails in Crothers’ Woods are able bodied and are often seeking a physical challenge or moderate exercise. The majority of trails should therefore, cater to that demographic. However, through the design of a formal trail network, one must recognize that less experienced or able bodied users, including children and families, may access the trails. By providing a

variety of options for trail experiences and a progression of trail difficulty levels, users may be more likely to choose the most appropriate trail for their skill level, lowering the risk of injury, and lead to more enjoyable experience for all trail users.

The proposed Designated Trail Network for Crothers’ Woods reflects the need for a variety of difficulty levels and types of experiences. The plan includes the following three trail types:

1. Beginner Doubletrack
2. Beginner Singletrack
3. Intermediate to Intermediate/Advanced Singletrack

The location of these trail types are based on a number of different factors including:

- Ease of accessibility;
- Connections to other trails - location with stacked loop system;
- Elevation changes;
- Influence of terrain on flow (e.g. steep slopes in tight trees v.s. gentle slopes in open meadow);
- Impact of trail (width/use type) on the natural environment;
- Impact of trail user/skill level on the natural environment;
- Feasibility of surfacing; and,
- Existing disturbances.

The table on the following pages provides a summary of the characteristics of each trail type. See the accompanying map for the designated trail plan.



## 10.4 Designated Trail Network

The proposed Designated Trail Network identifies a formal network of 8276 m, essentially reducing the trail “footprint” by 1.8 km, through closure and restoration of unsustainable problem trails. The identified network of designated trails presented in the trail plan includes a combination of existing trails and new alignments to circumnavigate unsustainable sections in order to maintain a logical route for trail users.

In developing the proposed Designated Trail Network, existing trail alignments have been included wherever possible, with re-routing or new trail alignments identified only when necessary in order to ensure a sustainable network.

## 10.5 Directionality

Trails should be designed for bidirectional travel. Some input from the public consultation session indicated that most conflict arises from the fact the trails are bidirectional. However, at this time the benefits of bidirectional trails outweigh the occasional conflict.

Some measures may be taken to reduce conflict due to bidirectional trails, including:

- Ensuring sufficient sightlines;
- Encouraging proper trail etiquette for cyclists of using bike bells to warn of approaches;
- Encouraging and enforcing dogs on-leash by-law compliance;
- Educating users about general trail etiquette such as allowing up-hill travelers the right of way, slowing speed when approaching other users, and other general courtesy for shared multi-use trails; and,
- Posting directional signs at intersections and maps at trailheads indicating trails

are multi-use and bidirectional and to ‘share the trail’ with a variety of users.

## 10.6 Connections to Other Trails

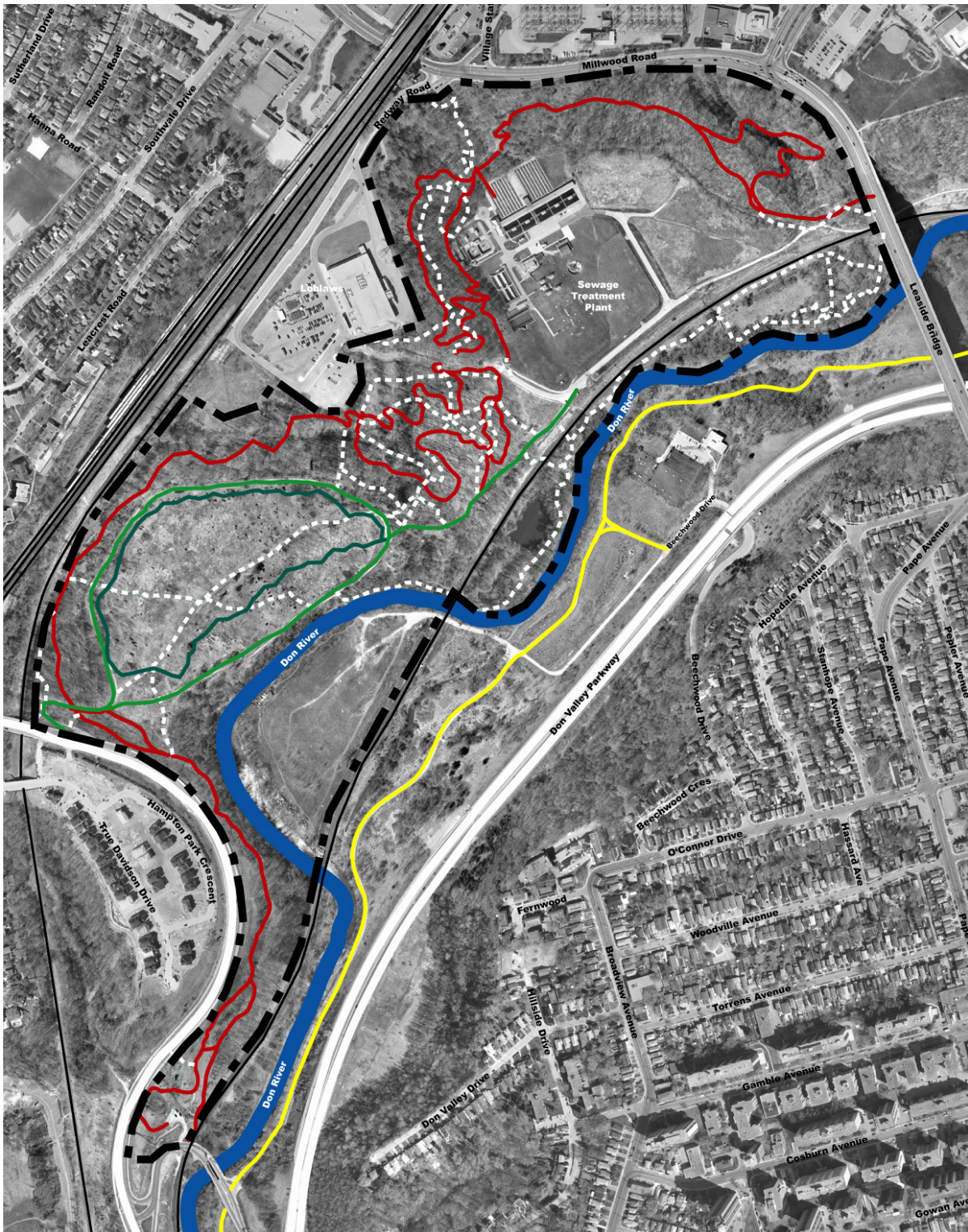
The Crothers’ Woods trails are not used in isolation. Formal and informal connections exist to the following trail systems or significant parks space:

- Lower Don Trail (paved) and Martin Goodman Trail;
- Todmorden Mills;
- Don Valley Brick Works and associated Discovery Walks trail system;
- E.T. Seton Park; and,
- From E.T. Seton Park, connections are possible to:
  1. Taylor Creek Park (paved trail) and east into Scarborough.
  2. East Don informal trails to former Bermondsey landfill site and potential to connect to Charles Sauriol Conservation Reserve.
  3. West Don trails through Glendon Forest and Sunnybrook Park and potentially beyond.

The extent of trails and park space through the tributaries of the Don River underscores the importance of the Crothers’ Woods area as a hub for use and for setting the stage for expectations and etiquette for the greater trail network. The extensive trail network throughout the Don watershed offers great opportunities for the City of Toronto Parks, Department of Forestry and Recreation to meet its goals while balancing environmental protection and human use.

The Crothers’ Woods trails are representative of other trail networks throughout the City of





- Beginner Doubletrack
- Beginner Singletrack
- Intermediate - Intermediate/  
Advanced Singletrack
- Closed Existing Trail
- Lower Don Trail

Proposed Trail Network for Crothers' Woods.





	<b>Beginner Doubletrack</b>	<b>Beginner Singletrack</b>	<b>Int – Int/Adv Singletrack</b>
Location	Gravel service road around Sun Valley and connection to bottom of Redway Rd.	Inner loop around Sun Valley	Valley slopes east of Don River, between Pottery Road and Millwood Bridge
Access	<ul style="list-style-type: none"> <li>• Bridge from snow dump</li> <li>• Bottom of Redway Road</li> <li>• 91 Bayview Avenue</li> </ul>	<ul style="list-style-type: none"> <li>• From Beginner Doubletrack intersection at east end of loop.</li> <li>• 91 Bayview Avenue</li> </ul>	<ul style="list-style-type: none"> <li>• Pottery Road</li> <li>• Millwood Bridge/NTSTP service road</li> <li>• Loblaws parking lot</li> <li>• Bridge from snow dump / Beechwood</li> <li>• 91 Bayview Avenue</li> </ul>
Trail description	Gravel surfaced trail loop without obstacles through open field. Gentle slopes with some short steep sections for limited challenge.	Easy dirt singletrack through open field/meadow areas and some trees. Gentle slopes. Open and flowing with some tight sections.	Intermediate to intermediate/advanced singletrack through trees along gentle to steep ravine slopes. Tight and technical sections.
Proposed length	1554m	1030m	5692m
Tread width	2 – 3m	1m	0.5m
Average trail grade	<5%	≤5%, with short sections up to 15%.	Max 15%, with limited short steeper sections.
Bridges?	None	None	Allow 0.6m wide low bridges (<0.9m off ground).
Technical trail features	None	Avoidable natural obstacles such as rocks and roots.	Avoidable and unavoidable natural obstacles such as rocks and roots. Optional natural enhanced TTFs with fillers such as logs and rock gardens and small drops.
Potential management issues	Short steep sections may be prone to erosion. Gravel wash out. Off-leash dog walking.	Maintenance of appropriate trail conditions/standards. Off-leash dog walking.	Maintenance of appropriate trail conditions/standards. Off-leash dog walking. Unauthorized structures. Water crossings. Slope stability below Loblaws.
Potential management solutions	Grading and/or resurfacing may be required maintenance. Re-route steep sections if heavy use leads to accelerated erosion. Off-leash dogs	Capital budget for plan implementation. Operating budget for maintenance. Stewardship program for community involvement. Education programs for community involvement.	Capital budget for plan implementation. Operating budget for maintenance. Development of trail construction standards. Establishment of a designated bike park. Stewardship program for community involvement. Education programs for community involvement.

Recommendations presented in this table are for consideration by the City of Toronto and are not to be implemented prior to development of construction standards and / or review by the legal department.

Toronto. Trails in other locations in the Don Valley as well as the Humber River, Rouge River, and Etobicoke Creek watersheds are similar in terms of condition and types of use. Management approaches and solutions outlined in the Natural Area Management Master Plan for the Crothers' Woods Area should be used for trails in other parts of the City where trail use is impacting the natural environment. See Appendix B: Guiding Principles for Trail Management Strategy.

### 10.7 The “Flats”

The “flats” is an isolated area within the study area that is only accessible by either illegally crossing the rail line, crossing over the river on the train bridge from the snow dump site, or by passing under the train bridge along the river bank. All means of access are informal, dangerous or illegal due to the presence of trains and potentially high river levels.

Within the area, a beginner level trail weaves through the trees and open meadow areas stretching from the snow dump / Sun Valley area, to under Leaside Bridge and continuing towards E.T. Seton Park where exiting the area again requires passing over or under the railway tracks.

Unauthorized dirt jumps and a pump track are located at the south end of the “flats” and extensive wooden structures for mountain biking are found throughout, although concentrated near the north end. The establishment of these features has involved cutting down trees and earthmoving.

The building of unauthorized structures and the inaccessibility of the area, particularly for emergency services given the potential for injury on the man-made structures, is a significant concern.

Due to the inaccessibility of the area, safety and risk management concerns, and opportunities associated with relocating the dirt jumps, pump track and built structures into an established

City-sanctioned designated bike skills park, it is strongly recommended that access to the “flats” be restricted, with relocation of the dirt jumps, pump track and technical trail features, as well as the beginner singletrack trail.

A number of the issues and opportunities associated with the recommendation for removal and relocation of the dirt jumps and other structures are outlined as follows:

- The inaccessibility of the current skills areas, the limited available space (i.e. clear of vegetation) and the lack services for the site make it less than ideal for establishing a designated bike skills park in this area. See *Managing Mountain Biking*, International Mountain Bicycling Association, 2007 for more information on choosing a skills park location and building a bike park.
- The demand for the features of the “flats” is an indication of the need for such facilities in the City of Toronto (i.e. beginner trails for safe skills development and challenging structures).
- The need to remove the structures and address the demand for such features presents the opportunity to designate a larger, more easily accessible and visible location. The size of the bike skills park should be significantly larger than the existing area to accommodate more users, additional features, spectator areas, secure tool and supply storage, washrooms, water supply (for maintenance of dirt jumps and drinking), telephones, etc.
- Although unauthorized, significant time, effort and pride are associated with the structures in the “flats” by those who have



contributed to the building. Engaging these users in identifying a location and the development of a new, City-sanctioned bike skills park will be critical to the success of both closing the “flats” and establishing a new bike park with user support.

- The desire to be on a trail along the river can be satisfied by establishing a beginner singletrack natural surface trail along the east side of the river, in parts between the paved bike path and the river where rail lines do not pose the same restrictions. This area should be considered in future phases of trail planning work.
- The attraction to this area for dog-walkers can be addressed by an alternate river-side trail and potentially by establishing a designated area for off-leash dogs.

Based on input from the public consultation sessions a strong demand for access to the “flats” is apparent. This area is absolutely not recommended for a bike skills park or related technical features due to the safety and access issues. However, if the City of Toronto were to consider establishing a designated access to simplify the beginner singletrack trail, the following issues should be considered:

- Bridges should be installed at both the north and the south ends.
- Bridges should be EMS and City vehicle accessible.
- Flood regimes must be considered in bridge design and safety considerations for allowing access to the “flats.”

- A cost analysis should be done to determine the costs and feasibility of using EMS accessible bridges to access and keep the beginner trail in the “flats” open versus establishing a more extensive beginner trail as well as an improved bike skills park in another location.
- The appropriateness of formalizing trails along river banks should be carefully investigated in the City’s future trail planning work due to the significance of riparian habitat, erosion issues and flooding risks.

## 10.8 Designated Use Areas

For the majority of trail networks and trail users, multi-use shared trails can be managed successfully with minimal conflict. The Crothers’ Woods trails and users are no exception. However, some uses, due to the nature of the use patterns or by-law restrictions may be better suited to a separate designated area.

Two such uses are found within the Crothers’ Woods area. They are:

1. Mountain bike skills park / dirt jump park building and riding; and,
2. Off-leash dog walking/exercising.

These uses deviate from the typical use patterns of trail users in that, rather than a continuous linear use, a wider area of disturbance may be created as a destination. Users will typically use a challenging bike feature over and over. These areas may be connected to a trail system, as is the case in Crothers’ Woods, but can also be established separate from trail networks.

These areas have significant social value by encouraging active healthy living, promote skill development (particularly for youth), addressing safety and liability issues and can alleviate pressures



on the natural environment by relocating the use into designated areas that can withstand heavy disturbance and do not have high habitat value.

### 1. Bike Skills Park

The clear demand for, and importance of, a designated bike skills park has been identified throughout this report and associated with a number of management issues including:

- Increased user safety and skill development;
- Decreased liability;
- Enhanced by-law enforcement;
- Minimized disturbance to vegetation;
- Improved access and signage; and,
- Improved trail design and the importance of filters.

In 2005, NECP staff had the opportunity to review a number of locations with Jay Hoots, a skills park consultant, designer and builder and a world renowned professional mountain biker. Jay Hoots works closely with IMBA and has been involved in over 19 skills park projects since 2001.

A number of sites were visited and input received on challenges and opportunities for each site.

The sites visited or discussed included:

- Bemondsey landfill;
- Loblaws property adjacent the parking lot and rail line;
- Sun Valley;
- Snow dump site;
- E.T. Seton Park (partially mowed area south of parking lot);

- Vacant land adjacent to Vanderhoof skate park; and,
- Stan Wadlow Park.

It is recommended that this process be continued with a professional skills park consultant to identify a suitable location in close proximity to Crothers' Woods, develop design concepts and remain involved in the construction process and maintenance plan development. Further, liaison with the mountain biking community and engaging volunteers in the design, building and maintenance of the facility will be critical to ensure success of the park.

A local bike park in close proximity to Crothers' Woods and linked to the Don River trail network should be designed to meet the needs of the local community. However, it is recognized that mountain biking, unauthorized dirt jump building and building of structures is not isolated to the Don Valley. These activities are wide spread throughout the City of Toronto in many urban areas where natural areas or open space exist. Therefore it is further recommended that City-wide needs also be addressed. See Appendix C: Guiding Principles for Trail Design for more detail.

More information on bike skills park development and services can be found at [www.hoots.ca](http://www.hoots.ca) and in *Managing Mountain Biking*, International Mountain Bicycling Association, 2007.

### 2. Off-leash dog walking/exercising

A recommended site for further consideration for an off-leash dog zone is the manicured area and/or non-native open space of the North Toronto Sewage Treatment Plant. This area offers excellent access, is quite large, has potential to increase parking, has no conflict with mountain biking, lacks significant native vegetation, contains some existing fencing, and is in close proximity to the trails currently used by off-leash dog walkers.



A number of Canadian municipalities are addressing the demand for designated off-leash zones. Design aspects to consider for establishing an off-leash dog area include but are not limited to:

- Fencing for dog and other users' safety;
- Environmental site conditions;
- Urine and feces pick up and impact on soil and ground water;
- Water requirements;
- Access by foot, transit and parking;
- Signage / risk management; and,
- Connections to park trails for on-leash dog walking.

Other sites considered included the snow dump site and Sun Valley. Both sites present potential user conflicts with the short-mid term potential for an off leash dog zone. The snow dump site is still used on an emergency basis and is currently littered with hazardous refuse (glass, metal, etc.). A number of management documents identify long term goals for Sun Valley as being reforestation to buffer the existing Crothers' Woods forest. Introducing a concentration of off-leash dogs here could conflict with the restoration goals for the site and impact wildlife known to frequent the area (deer, coyote, raptors, ground nesting killdeer and other birds, etc.).

## 11.0 Enhanced By-law Enforcement

Enhanced by-law enforcement, along with monitoring and persistent repairs and clean-up in problem areas in the park, can help to improve a number of situations including illegal crossing of rail corridors, occurrence of off-leash dogs, illegal dumping, and homeless encampments. Parks staff should work with by-law enforcement to identify priority areas of enforcement in connection with

park improvements in regards to dogs, parking and illegal building in the park.

### 11.1 Crossing of Railway Tracks

Crothers' Woods is located in the vicinity of a number of rail lines. Many park users are cutting across the rail lines as a short-cut, or as a travel route. Not only is this practice dangerous it is illegal as per the Railway Safety Act and the Ontario Highway Traffic Act. To help mitigate this situation, a number of actions must be taken. This includes:

- Approach CN Rail to repair all sections of fence along the rail corridors in Crothers' Woods which have been cut;
- Remove all features in the park which may encourage users to cross tracks. If possible and desired, an alternative safe route should be provided;
- Ensure proper signage is in place;
- Implement trail closure techniques to help block and disguise trails which encourage users to short-cut across rail lines; and,
- Monitor situation and re-instate measures as necessary to prevent access.



*Despite the warning signs in Crothers' Woods, park users continue to illegally cross the tracks to access the "flats".*

## 11.2 Off-Leash Dogs

Currently Crothers' Woods does not have a designated off-leash dog zone. However, the area is regularly used as an off-leash area by casual dog walkers as well as apparent commercial dog walking operations.

To keep the park safe and enjoyable for all park users, the following steps in regards to dogs should be taken:

- Provide clear signage at the entrance points to Crothers' Woods that dogs must be on-leash at all times;
- Provide clear signage at key locations on the trails indicating that dogs must be on-leash at all times;
- By-law enforcement of off-leash dogs;
- Provide users with adequate facilities to clean-up after dogs (trash cans) and ensure frequency of garbage pick-up is sufficient; and,
- Consider the establishment of a designated off-leash dog area in close proximity to Crothers' Woods.

## 11.3 Illegal Dumping and Homeless Encampments

Persistent monitoring, by-law enforcement and removal of garbage and waste as a result of illegal dumping and overflowing trash receptacles will help keep Crothers' Woods clean and discourage dumping and vandalism.

Homeless encampments should be dealt with as per the City's Streets to Homes program which assists homeless people, including those residing in encampments in the Don Valley system, to find alternative housing. Encampments should be reported to the City's Streets to Homes program immediately.

## 12.0 Signage & Wayfinding

A signage and wayfinding strategy is needed for Crothers' Woods. Various types of signage are required throughout the park to direct and educate users. A good signage strategy will help to keep people on the trails, minimizing impacts on the environment, reducing trail conflicts between user groups enhancing the park user's experience.

### 12.1 Information Kiosk

Trail information kiosks will be the core of the signage and wayfinding system in Crothers' Woods. The Kiosks should be designed as a common architectural feature in the park which helps identify the primary, secondary and other access points. Kiosks should include information regarding safety and liability, maps, rules and regulations, trail etiquette and a community notice board.

#### *Safety and Liability*

Information regarding user safety and liability should be posted at each entrance to the park. The exact contents and wording of the signage needs to be developed in conjunction with the City's legal department.

#### *Trail Map*

Large coloured trail map should be created identifying the various trails with their level of difficulty, distances, key features. Landmarks should be identified along with connections to the surrounding community and adjacent trail systems in the valley. A "You Are Here" arrow should also be provided on the map.





## Rules and Regulations

Information regarding permitted and non-permitted activities and park by-laws should be clearly identified. Input from the City's legal department should be provided on the proper wording in reference to the building of structures and dirt jumps in Crothers' Woods.

### Trail Etiquette

Information signs should be installed regarding proper trail etiquette for different trail users (hikers, cyclists, dog walkers) when using the trails. For example which types of trail users have the right-of way, protocol for passing on the trail and procedures for warning other users of your presence.

### Community Notice Board

A community notice board should be created that provides key information to other park users regarding special community events, clean-up days, trail building workshops, closed or diverted trails or other park improvements underway.

## 12.2 Directional Signage

A series of direction signs with distances should be provided throughout the park. These signs should identify connections to other trails, road intersections and trailheads.

## 12.3 Level of Difficulty

Using the universally understood trail difficulty rating system commonly used in skiing, trails should be signed as easy (green circle), intermediate (blue square) and advanced (black diamond).

## 12.4 Other Signs

A series of signs for trail closures, habitat restoration initiatives and interpretive signs should be provided throughout the park to enhance user

experience and educate users regarding park management activities in Crothers' Woods. For more information on signage strategies for trail heads, see the signage chapter in "*Managing Mountain Biking*", International Mountain Bicycling Association, 2007.

## 13.0 Park Maintenance and Operational Costs

A maintenance and operation strategy should be implemented to provide a safe and enjoyable environment for park users, routine inspection and repair of the park's trails and associated infrastructure is required.

### 13.1 Garbage Pick-up

As trail improvements are made, user numbers may increase causing an increase in the amount of litter. To help meet this increase, additional trash and recycling receptacles will be required at the various trailheads. These bins should be routinely collected as required. Illegal dumping should be cleaned-up as soon as it is identified to keep the park in a clean and cared for state.

### 13.2 Trail Maintenance

An adaptive management approach for trail monitoring and maintenance should be undertaken. Trail construction standards should be developed by the City to help guide the construction and maintenance of the City's trails. Properly functioning trails will keep users on the trail minimizing erosion causing sedimentation of water courses, and short-cutting off trail which impacts vegetation. The construction standards and maintenance program should include how to:

- Undertake tread repair;

- Ensure adequate drainage;
- Modify surfacing of trail in areas that are persistently wet during high use periods to minimize erosion;
- Remove obstructions such as fallen trees immediately to ensure users stay on the trail;
- Block informal trails as soon as they develop with brush barriers or more aggressive barricades if necessary, to prevent their continued use. Use signs to educate park users as to why the trail is closed; and,
- New informal trails which are consistently used despite the trail manager’s best efforts should be investigated for feasibility as to making a permanent feature.

The maintenance of trails is an iterative process requiring that trails be monitored and evaluated in regards to success and failures of trail building and maintenance techniques employed. Based on the evolution of the trail system, maintenance should be refined as necessary to ensure that the trail system is sustainable. This adaptive management approach will require detailed monitoring and record keeping so that park managers understand past successes and failures in regards to the trail system.

### 13.3 Maintain and Repair of Trail Structures

The City’s trail construction standards should also cover the design and maintenance of trail structures. City endorsed trail structures should be routinely inspected and repaired as required to ensure safety and protection of the natural environment. Bridges, root protection barriers, gates and fences and signage, which are used by trail user should be maintained in proper working condition at all times. Acts of vandalism and graffiti should also be repaired immediately to help reduce instances of further vandalism.

Technical trail features (TTF) built by the public on the other hand are also the responsibility of City staff. However, the resources required to monitor, inspect and remove unsafe structures are not available. Past City experience tells us that the TTFs found throughout the park will be replaced within days and the monitoring and removal of features as they are built will be an ongoing dilemma. Despite this, these structures must be removed as resources permit. The message must also be given to stunt builders that the City cannot condone stunt building and is therefore required to remove these features on an ongoing basis.

To address unauthorized trail features, a City-sanctioned local bike skills park should be developed as soon as possible, as the demand for such a facility is high. A designated area for this type of mountain biking may help alleviate the pressure on the natural environment from unauthorized building and reduce safety concerns for park users due to potentially unsound structures. It is also critical that recommendations from City of Toronto legal department are followed.

Until an alternative mountain bike skill facility is provided in the City, the removal of TTFs will be an ongoing challenge.



## 14.0 Priorities

A number of capital improvements are recommended for Crothers' Woods. These works are necessary to improve the park from a safety, ecological and park user perspective. These improvements include various trail closures, re-alignments and improvements including signage, habitat restoration and management initiatives.

Initiatives have been identified as safety, environmental and user priorities based on the following criteria:

### *Public Safety Priorities*

Initiatives pertaining to improved park safety for users should be scheduled for implementation as soon as the operating budget permits.

### *Environmental Priorities*

Environmental park improvements are initiatives that will protect and improve the ecological integrity of Crothers' Woods. For example, habitat restoration initiatives and invasive species management efforts, should continue to be implemented and expanded where possible.

### *User Experience Priorities*

User experience priorities are initiatives that will improve the park user's experience, but are not necessarily connected to user safety or ecological health of the park. Included are ongoing maintenance and improvements to the park to keep the park enjoyable for all user groups.

Many of the proposed initiatives are interconnected and interdependent for success. For example the success of a user safety priority initiative may be dependent on a park user priority being implemented. Therefore, an adaptive and iterative approach to implementation will be required as monitoring of the park's successes and failures are identified and new information

becomes available as initiatives are implemented. Generally, the implementation of park user priority should not be at the expense of park safety or environmental priority, and the implementation of an environmental priority should not be at the expense of user safety priorities.

### 14.1 Public Safety Priorities

The following initiatives should be of the highest priority. This includes posting safety/liability signs at all entrances, the repair and monitoring of fences, and the closing and re-alignment of unsafe trails. In parallel with this process, the City should begin to identify and establish a designated bike skills park to help minimize the occurrence of other informal jumps and skill structures from being constructed in the vicinity.

The establishment of safe trailheads and access points to the park should also be established in conjunction with a thorough signage program which outlines rules and regulations and trail etiquette. Once a user safety priority is implemented, on going monitoring and enforcement will be critical to ensure success. This needs to be conducted in collaboration with By-law enforcement, the City's legal department and Park's staff.



#	Management Initiative or Capital Improvement	Description	Estimated Consulting Budget	Estimated Implementation Budget	Volunteer Involvement
1.1	Warning and Liability Signs	Design and post warning signs at all entrances that outline user's liability.	\$8,000	\$16,000	○
1.2	Close trails crossing tracks	Fences adjacent to tracks which have been damaged to facilitate access across tracks must be repaired by CN. Once fixed trails must be closed to prevent future crossing.	\$10,000	\$15,000	○
1.3	Close and/or realign unsafe trails	Trails that have been identified as being unsafe and are not constructed to proper trail standards should be realigned or closed to park users.	\$20,000	\$25,000	●
1.4	Trail Protocol Signage	Provide Protocol signage at key entrances and intersections throughout the park to minimize user conflicts.	\$8,000	\$16,000	○
1.5	Directional and Skill Level Signage	Assign skill level to trails and provide map of system at trailheads to improve safety and user enjoyment of the park.	\$8,000	\$12,000	○
1.6	Pottery Road trailhead improvements	Current design of Pottery Road trailhead is unsafe for vehicular traffic ingress and egress due to sightlines. Improvements are required in consultation with stakeholders.	\$40,000	\$40,000	○
1.7	Design Bayview access point as a pedestrian only trailhead.	Sign and reconfigure Bayview access point to prevent cars from parking. Trailhead is unsafe for vehicular traffic ingress and egress due to sightlines	\$8,000	\$15,000	○
1.8	Establish monitoring schedule to inspect trails and associated structures	Periodic inspection of trail structures such as bridges and switchbacks are necessary to ensure safety of park users.	\$25,000	NA	○
1.9	Close undesignated access points	Close access point between tracks on Bayview.	\$6,000	\$10,000	○
1.10	Develop Trail Construction Standards	Develop trail construction standards for the design, maintenance and inspection of trails in Crothers' Woods and other natural environment parks in the City.	\$85,000	NA	○
<b>Total</b>			<b>\$218,000</b>	<b>\$149,000+</b>	



## 14.2 Environmental Priorities

Initiatives which will improve the park's ecological health are critical. This includes habitat restoration initiatives, exotic species removal and removal

and/or realignment of trails which cause erosion and damage to vegetation. These initiatives should be conducted in concert with TRCA and forestry staff.

#	Management Initiative or Capital Improvement	Description	Estimated Consulting Budget	Estimated Implementation Budget	Volunteer Involvement
2.1	Close or re-align trails which are causing harm to the environment	Trails which pass through areas which are sensitive to erosion, harming vegetation, or unnecessarily disturbing wildlife, should be realigned or closed.	City	\$20,000	●
2.2	Interpretation, trail closures and restoration signage	Develop and install signage throughout park to inform users regarding ongoing environmental initiatives in the park.	\$5,000	\$20,000	●
2.3	Habitat Restoration	Undertake habitat restoration in conjunction with trail improvements.	City	\$25,000	●
2.4	Invasive Species Management	Undertake invasive species removal in conjunction with trail improvements.	City	\$10,000	●
2.5	Off-Leash Dog Walking	Initiate process to investigate feasibility of incorporating an off-leash dog area in Crothers' Woods.	\$30,000	\$65,000	●
<b>Total</b>			<b>\$35,000</b>	<b>\$140,000+</b>	

### 14.3 User Experience Priorities

User experience priorities will improve the park user's experience in Crothers' Woods. This includes trail building, trailheads, interpretive

signs, and other user amenities. Initiatives related to trail design and management throughout the GTA are also third level priority.

#	Management Initiative or Capital Improvement	Description	Estimated Consulting Budget	Estimated Implementation Budget	Volunteer Involvement
3.1	Build new sections of trail	Provide trails which have been identified in this plan as necessary to provide a complete trail network which caters to a range of skill levels and provides access to the various terrain found in the park.	City	\$50,000	●
3.2	Designate Loblaw's parking lot as main trailhead	Enter formal agreement with Loblaw's to designate section of store's parking lot the primary trailhead for Crothers' Woods.	\$15,000	\$25,000	○
3.3	Redway Trailhead	Develop Redway Road Trailhead	\$10,000	\$15,000	○
3.4	Beechwood Trailhead	Develop Beechwood Road Trailhead	\$10,000	\$15,000	○
3.5	Garbage and Recycling	Provide additional garbage and recycling containers at park entrances.	City	\$8000	○
3.6	Establish Crothers' Woods Advisory Committee	Form community advisory committee.	City	NA	●
3.7	Operations Funding	Secure operating funding and resources to inspect and maintain the trail resource	City	NA	○
3.9	Internal Coordination	Liaise with other sections and departments (e.g. Recreation) to promote, maintain and develop trail initiatives.	City	NA	○
3.10	Don Valley Trails Coordination	Address connections and management of adjacent areas (e.g. trail north of Millwood Bridge)	City	NA	○
3.11	City Wide Initiatives	Identify and prioritize other trail networks within the City of Toronto, and initiate development of management plans or application of general guiding principles as appropriate.	City	NA	○
3.12	Networking	Collaborate with other land managers in the GTA or nation-wide, that are undertaking similar trail management initiatives.	City	NA	○
<b>Total</b>			<b>\$35,000</b>	<b>\$113,000</b>	





## 15.0 Roles and Responsibilities

The successful management of Crothers' Woods and the implementation of the recommended improvements will require the contributions and commitment of various groups. This includes the City of Toronto, Toronto and Region Conservation Authority, Task Force to Bring Back the Don, various community stewardship groups and recreation groups, and a Crothers' Woods Advisory Committee.

The funding and decision-making related to the implementation of the recommendations described above remain the responsibility of the City. However, in the past, numerous individual volunteers have made tremendous contributions to trail improvements in the park. Trail closures and building under the direction of the City of Toronto with the expertise of the International Mountain Bicycling Association, have made significant improvements in the park.

For this to continue, it is important that the efforts of the volunteer groups are focused on projects with clear and achievable results. Potential projects include:

- Trail closures;
- Trail Building;
- Garbage clean-up;
- Planting of edge species and understory species;
- Wildlife enhancement projects; and,
- Vegetation and wildlife monitoring.

### 15.1 City of Toronto

The City of Toronto is responsible for the management and implementation of initiatives in the park. Specific duties include:

- Daily management and maintenance of the park;
- Provide adequate funding to facilitate the implementation of recommended park improvements;
- Overseeing of park improvements through Park's capital budget;
- Coordination and focusing activities of groups and organizations interested in helping to improve the park;
- Enforcement of municipal by-laws in regards to off-leash dogs, dumping, homeless encampments and other illicit activities; and,
- Monitoring the status of the natural heritage system.

In addition, a Memorandum of Understanding (MOU) should be developed between the organized trail user group and the City of Toronto in order to clearly define roles, responsibilities and agendas. Such a document may help to reduce conflict between the parties involved.

### 15.2 Toronto and Region Conservation Authority

As the landowner of Crothers' Woods, the Toronto and Region Conservation Authority (TRCA) should be made aware of developments as they relate to liability.

### 15.3 International Mountain Bicycling Association

The International Mountain Bicycling Association (IMBA) has played a significant role over the last 2-3 years introducing sustainable trail design theory and building practices to City of Toronto staff and local trail users as well as providing education and insight into the sport of mountain biking. The partnership that has developed should continue as needed to further develop sustainable trail management solutions for Toronto trails, and to continue to work with local mountain bikers to advocate for mountain bike trail access in order to meet the needs of the mountain bikers.

However, IMBA's direct involvement may decrease as a Don Valley, or Toronto-wide, Mountain Bike Club forms and takes on the role of representing the interests of mountain bikers for future initiatives within the City of Toronto.

### 15.4 Local Trail Users Club(s)

A number of attempts have been made by local mountain bikers to start a club to facilitate liaison with the City of Toronto and organize rides, trail work sessions, and other activities.

Interest by local trail users to form a club or organized group and to build a working relationship with land managers is encouraged. Benefits of an established organized trail user or mountain bike group include:

- Improved communication between key group representative and land managers;
- Act as a liaison to facilitate communication between land managers and individual trail users;
- Increased resources to solicit volunteers for trail work;
- Increased potential for fund raising (e.g. collaborative grant applications);

- Development of a clearly defined goal of the club and identification of priorities for the users group;
- Development of a clearly defined relationship between the club and land managers;
- Improved ability to address urgent problem areas with land managers;
- Potential to develop a monitoring program to identify trail issues as they arise; and,
- Potential to jointly develop trail solutions and other initiatives, therefore land managers may more easily gain buy-in from trail users.

A Memorandum of Understanding (MOU) should be developed between the organized trail user group and the City of Toronto in order to clearly define roles, responsibilities and agendas. Such a document may help to reduce conflict between the parties involved.

### 15.5 Community Stewardship Groups

Various community stewardship groups have played an active role in the management of the Don Valley and specifically Crothers' Woods. These groups include Task Force to Bring Back The Don, Toronto Field Naturalists and the Don Watershed Regeneration Council. Potential roles for these groups include:

- Community liaison;
- Organize fundraising initiatives for recommended park enhancements;
- Review development proposals; and,
- Participation in park management and monitoring.



## **15.6 Community Recreation Groups**

Various recreation groups and unaffiliated individuals have contributed significantly to the closing of unsafe trails and construction of new trails in Crothers' Woods. Members from various mountain biking and trail running groups should continue to be engaged for their expertise and enthusiastic volunteer base.

Potential roles for these groups include:

- Community liaison;
- Building of trails and other park improvements;
- Organize fundraising initiatives for recommended park enhancements;
- Review development proposals; and,
- Participate in park management and monitoring.

## **15.7 Crothers' Woods Advisory Committee**

An advisory committee should be established with representation from the City of Toronto, Toronto and Region Conservation Authority, Community Stewardship Groups, Community Recreation Groups, and the surrounding community. This committee will be instrumental in organizing fundraising initiatives for recommended park enhancements and would help advise the Parks Department in making decisions in regards to the management of the park and the implementation of new initiatives.







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# *Appendix A: Natural Heritage Inventory & Analysis*





# Natural Heritage Inventory and Assessment

## Physiography and Topography

Crothers' Woods is situated in the Sand Plain physiographic region, immediately south of the glacial Lake Iroquois shorecliff. The east and west branches of the Don River have a junction just upstream of where the river has cut through the shorecliff. Thus, Crothers' Woods is located in the deep wide lower Don River valley area. This area was formed after the draining of glacial Lake Iroquois, when the nearest ice front was somewhere around North Bay. At that time the level of water in the Lake Ontario basin fell to (or near) sea level. As a result of this and the lack of stabilizing vegetation, the Don River cut a deep ravine through the soft alluvial plain of sand, gravel and clay tills to the lower lake level.

The topography of the study area influences the distribution of vegetative cover and is directly related to soil erosion rates. Generally, within the study area, the steeper slopes have been left in a forested state, while the flatter areas have been cleared for other uses. The steeper slopes tend to be more susceptible to water erosion, especially where ground cover is disturbed by human activity. Crothers' Woods lies between terraces on the sides of the primarily glacial valley. The Don Valley Parkway is situated on a terrace. The topography of Crothers' Woods is characteristic of the Don Valley ravine system. The edges of the park to the north, west and south are steep with many areas of slope in excess of 25%. Flatter areas, such as Sun Valley and the lands accommodated by the sewage treatment plant are located between the steep ravine side slopes and the Don River with slopes typically under 5%.

A digital elevation model was supplied by the

City of Toronto as background information for this study. The original model consisted of elevations and contours. These were subsequently reclassified into slope categories that were determined significant in terms of trail design and environmental issues.

## Soils and Site Drainage

The soil types within the study area are significant because the soil texture and the surface and subsurface drainage characteristics are directly related to their erodability (erosion potential) and their ability to support vegetative cover. Soils that are predominantly silt and very fine sand are greatly susceptible to water erosion. Where the silts and sands are bound in a tight matrix of clay, they are less susceptible. Although no detailed soils mapping fell within the scope of this work, a generalized picture of the distribution of soil types can be derived from existing literature, and from field observations.

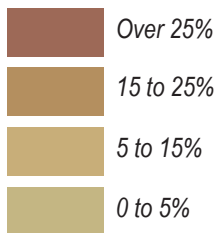
Soils types depend largely on geological origins. The Don Valley is a glacial spillway that was carved into the pre-existing interbedded tills of the Wisconsin, the inter-glacial Sangamon deposits, and the upper Illinoian tills. The soils of the Sangamon and the Illinoian were deeply buried and are found only at the base of the former Toronto Brick Yard Quarry, and not within the Crothers' Woods study area.

Soils in the study area are mainly Wisconsin glacial deposits (tills interbedded with lacustrine and alluvial soils, all over-ridden) on the valley walls, overlain in some, but not all places on the valley floor by more recent alluvial deposits, with recent fluvial deposits within the banks of the Don and some of its abandoned channels. Recent organic soil accumulations are found in a limited number of topographically depressed areas.

The soil differences across the site are coincident with the topography. On the valley floor, there are geologically recent riverine alluvial deposits,







Topography of Crothers' Woods.



comprising fine silts and sands. On-going flood-related deposition is evident immediately beside the river where stratified silts and fine sands predominate. This material lies on the sands, silt and clays of the Scarborough and Don Formations that are less permeable and tend to support the high water table conditions that are conducive to organic soil accumulations and wetland conditions. Above the Scarborough Formation, and nearly to the top of the valley wall, lies the Sunnybrook Drift Formation, a less permeable assemblage of glacial till, glaciolacustrine and mixed soil deposits. The layer above this is more permeable and is known as the Thorncliffe Formation, comprising layers of glacial sands, silt and clays.

As is typical throughout the City's valleylands, most of the soils in the study area are susceptible to erosion. Some of them, such as the recent alluvial silts on the valley floor and the buried lacustrine varved silts and clays on the valley walls, very much so.

An area of the valley floor has been altered by the former existence of an industrial use. The buildings and other built features above the ground have been removed. It is not known whether there is potential for contaminated soil in this area, but it appears that the natural soil has been replaced or covered with demolition debris or other land cover. Soil erosion is not a major issue in this area primarily because of the flat topography and the coarse texture of the surface material.

On the steep slopes, most precipitation runs off. This overland flow of water, exacerbated by the lack of a vigorous herbaceous vegetation layer, causes sheet and gully erosion. Where the natural surface trails cross these drainage features, especially if the feature is topographically depressed so that the trails slope down to the drainage feature, there is evidence of soil being eroded from the trail and deposited directly in the channels. This generates concerns regarding the need for protecting water quality and potential fish habitat.



Main, well-used trail at top of a steep slope along edge of Don River, within hardwood stand (FOD5-2) dominated by sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*) and red oak (*Quercus rubra*). Bare soil subject to erosion by transverse sheet flow.



Natural surface trail along steep slope within old field habitat (CUM1-1) of hydro corridor, north of Pottery Road, showing wheel rutting and pooling of water in a transverse drainage swale in immediate foreground. Fall line trail acts as conduit for sediments to a drainage feature.



Exposed dirt trail on steep valley wall slope near Loblaws parking lot, partially within upland hardwood bush (FOD5-2) and part of hydro corridor (CUT1-A1), showing exposed tree roots and compacted soils. Erosion is caused by abrasion from foot and vehicular traffic, or by overland water flow.



Where flatter topography exists at these higher levels, some infiltration may occur where pockets of coarser soils material are present. Ponding also can occur. Any infiltrated water has the potential to daylight (i.e., as seeps) at lower elevations on the side-slopes, as a result of encountering soils layers of lower permeability. In the base of the valley, the recently deposited fines are susceptible to additional movement under flood conditions.

### Vegetation Communities

The study area is located in the eastward extension of the Niagara Section of the Deciduous Forest Region (Rowe 1972) where very favourable climatic and soil conditions have allowed the extension into Canada of many trees, shrubs, and herbs from the deciduous forest to the south. This area is sometimes referenced as a Carolinian forest system; however, Crothers' Woods currently does not exhibit many indicator Carolinian species.

The study area also lies within MNR Site District 7E4, and which is a subset of Site Region 7. The Deciduous Forest Region as defined by Rowe is more-or-less the same as Site Region 7.

This forest region occurs in most of southern Ontario and is represented primarily by forests composed of broadleaf tree species. The characteristic association is dominated by deciduous trees comprising beech and sugar maple, with presence of other species such as basswood, red maple, red oak, white oak and bur oak. This region also is the centre of distribution in Canada of black walnut, sycamore, swamp white oak and shagbark hickory, with the more widely distributed butternut, bitternut hickory, silver maple and blue beech.

No detailed herbaceous inventory was undertaken; however, it is known that species of significance and of management concern are found in the valley system just north of the study area. Therefore, it is likely that such species also occur within Crothers' Woods.

The vegetation communities recognized on the site, based on the Ecological Land Classification (ELC) system, are shown on the ELC map. There is a range of ELCs within Crothers' Woods. The study area includes various and often heavily disturbed old field meadows associated with previous industrial and commercial uses (Sun Valley area). Most of the area shows evidence of use and disturbance. Portions were almost totally cleared of forest during the early part of the 19th century. Within the forested areas, the woodland floor supports few ground cover species and comparatively low amounts of leaf litter. The extensive, well-worn trail system likely has adversely affected the herbaceous and duff layers.

Drainage and soil moisture conditions include dry-moist to mesic-wet, supporting upland deciduous and mixed stands to lowland forest, thicket swamps and small marsh and meadow marsh areas.

The table presented below contains a summary of the ELC units found within Crothers' Woods.

### Crothers' Woods ESA

Crothers' Woods was designated as an ESA (#133) by TRCA in 1995, because it fulfilled two criteria:

Criteria #5 – rare/endangered species;

Three species were indicated as rare in TRCA Region:

- Greater Straw Sedge (*Carex normalis*) (L3)(S4)
- Thin-leaved Sunflower (*Helianthus decapetalus*) (L3)(S5)
- Pale-leaved Sunflower (*Helianthus strumosus*) (L4)(S5)



The current L-ranks for these species are presented. TRCA categorizes vegetation species within the TRCA region according to their known occurrence and with reference to their vulnerability to development changes, from L5 - common to L1 - rare.

The MNR significance ranks also are presented: S4 - Apparently Secure, Uncommon but not rare; some cause for long-term concern due to declines or other factors; and S5 - Secure, Common, widespread, and abundant in the nation or state/province.

The butternut tree (*Juglans cinerea*) also is present. Its status has changed since the time of the ESA investigation. It is now on the endangered species list.

Criteria #6 – exceptional high quality and/or diverse habitats and communities; Part of the significance of this area is based on the diversity of tree species within a relatively small woodland, including:

- Eastern Hemlock (*Tsuga canadensis*)
- Bitternut Hickory (*Carya cordiformis*)
- Butternut (*Juglans cinerea*)
- Black Walnut (*Juglans nigra*)
- Blue Beech (*Carpinus carolinus*)
- Beaked Hazel (*Corylus cornuta*)
- Ironwood (*Ostrya virginiana*)
- American Beech (*Fagus grandifolia*)
- White Oak (*Quercus alba*)
- Red Oak (*Quercus rubra*)
- Witch-hazel (*Hamamelis virginiana*)
- Black Cherry (*Prunus serotina*)
- Black Maple (*Acer nigra*)
- Sugar Maple (*Acer saccharum*)
- Basswood (*Tilia americana*)

### Invasive Plant Species

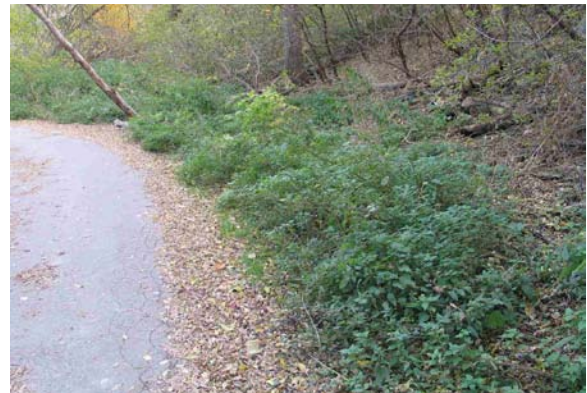
A number of the vegetation species in Crothers' Woods are non-native species. Further a number of these species are aggressively invasive. Invasive species not only decrease the potential for native



A clump of invasive Japanese knotweed (*Polgonum uspidatum*), within a narrow band of Manitoba maple lowland woods (FOD7-A) along edge of Don River.








General view of invasive common teasel (*Dipsacus fullonum*) within old field habitat (CUM1-C) along steep (15 - 25%) bowl-shaped slope.



A band of invasive European stinging nettle (*Urtica dioica*), that borders edge of paved path/service road.



**CULTURAL**

	<b>CUM1-1</b>	Dry-Moist Old Field Cultural Meadow
	<b>CUM1-C</b>	Exotic Forb Old Field Cultural Meadow
	<b>CUP1-A</b>	Native Deciduous Plantation
	<b>CUP1-C</b>	Black Locust Plantation
	<b>CUP2-A</b>	Native Mixed Deciduous-Coniferous Plantation
	<b>CUP3-H</b>	Coniferous Fenceline Plantation
	<b>CUT1-1</b>	Sumac Cultural Thicket
	<b>CUT1-A1</b>	Native Deciduous Sapling Thicket
	<b>CUT1-C</b>	Exotic Cultural Thicket
	<b>CUW1-2</b>	Dry Red Oak Cultural Woodland
	<b>CUW1-A2</b>	White Pine Cultural Woodland
	<b>CUW1-A3</b>	Native Deciduous Cultural Woodland
	<b>CUW1-B</b>	Exotic Cultural Woodland
	<b>CUY</b>	Cultural Yard

**FOREST**

	<b>FOD3-1</b>	Dry-Fresh Poplar Deciduous Forest
	<b>FOD4-B</b>	Dry-Fresh Manitoba Maple Forest
	<b>FOD5-2</b>	Dry-Fresh Sugar Maple - Beech Deciduous Forest
	<b>FOD5-3</b>	Dry-Fresh Sugar Maple - Red (White) Oak Deciduous Forest
	<b>FOD7-A</b>	Fresh-Moist Manitoba Maple Deciduous Forest

**MARSH & POND**

	<b>MAM2-A</b>	Common Reed Mineral Meadow Marsh
	<b>MAS2-1</b>	Cattail Mineral Shallow Marsh
	<b>SWT2-2</b>	Willow Mineral Thicket Swamp









Two invasive plant species, including a stand of black locust trees inundated with a groundcover of dog-strangling vine.



A view inside a portion of invasive upland black locust deciduous plantation (CUP1-C), with a groundcover of invasives such as dame's rocket (*Hesperis matronalis*) and dog-strangling vine.



Small copse of non-native Norway maple (*Acer platanoides*), within a groundcover of dog-strangling vine, along steep slope consisting of exotic cultural woodland (CUW1-B).

flora to colonize and thrive in an area, they also have been found to contribute, either directly or indirectly, to such things as increased erosion, loss of vigour of native species, and decrease in wildlife habitat diversity. The disturbed nature of much of the terrain in Crothers' Woods and the on-going impacts to the soil are conducive to the introduction and spreading of these species.

The main problematic invasive species for the Woods that were identified as part of the field investigations include the following:

#### Adventive/Non-native Vascular Plant Species

Dog strangling vine	<i>Vincetoxicum rossicum</i> *
Garlic mustard	<i>Alliaria petiolata</i> *
Wild teasel	<i>Dipsacus fullonum</i> *
Common burdock	<i>Arctium minus</i>
Japanese knotweed	<i>Polygonum cuspidatum</i> *
Dame's rocket	<i>Hesperis matronalis</i>
European stinging nettle	<i>Urtica dioica</i> spp. <i>Dioica</i> *
Common tansy	<i>Tanacetum vulgare</i>
Canada thistle	<i>Cirsium arvense</i> *
White sweet-clover	<i>Melilotus alba</i>

#### Adventive/non-native Woody Plant Species

Black locust	<i>Robinia pseudo-acacia</i>
Norway maple	<i>Acer platanoides</i>
Tree of heaven	<i>Allanthus altissima</i> *
White mulberry	<i>Morus alba</i>
Riverbank grape	<i>Vitis riparia</i> *

Locations where these species form a substantial component of the vegetation cover are indicated on the ELC-vegetation community mapping.

All but one of these species, riverbank grape, is non-native. Riverbank grape is included in the list as it is decimating woodland edges across the GTA.

It would be very beneficial to the ecology of the Woods if all of these species were eradicated. However, because of their very aggressive growth pattern, and their ability to out-compete other species, effort should be directed to those in the table that are marked with an asterisk (\*) first.

## Wildlife

No detailed wildlife inventory was undertaken for the area. Suitable habitat exists to support a wide range of resident (including summer resident), migrant, and visitant terrestrial wildlife species. The species that would be present would be characteristic of urbanizing, agricultural landscapes found elsewhere within the region and in the GTA to the east. The species that persist in the area have acclimated to the use types and extent and will continue to persist if the habitat conditions are maintained and improved.

Habitat that is important to local wildlife (resident or summer resident species) and to seasonal birds (and bats) of passage is present within the Woods. The woodland units with their intermingled wetland pockets and riparian habitats offer a range of habitat conditions that provide for enhanced species diversity: edge species, woodland area sensitive birds, migratory bird habitat, amphibian woodland breeding sites, raptor nesting and perch sites.

The TRCA in their investigation of the ESA (June 15, 1995) observed twenty-six bird species as possible breeders including Red-tailed Hawk (*Buteo jamaicensis*), Eastern Wood-peewee (*Contopus virens*), Great Crested Flycatcher (*Myiarchus crinitus*), Gray Catbird (*Dumetella carolinensis*) and Chestnutsided Warbler (*Dendroica pensylvanica*).

Incidental sightings and anecdotal evidence indicate the presence of typical species such as eastern cottontail, gray squirrel, meadow vole, coyote, red fox, raccoon, and striped skunk).

Human use of the valley has compromised its attractiveness to wildlife and likely has adversely affected productivity of selected species. Dogs are observed frequently in the Woods and it is likely that free-roaming domestic and feral cats penetrate into the area. However, at night, when human impacts such as light and sound are reduced (or eliminated) and when human presence in the

valley ceases, animals which are active at night (and through the crepuscular periods) will move into the area to forage (raccoon, skunk, opossum, owls, cottontail) and/or may pass through the area enroute to other parts of the valley or to tableland destinations (raccoon, skunk, opossum, owls, fox, coyote).



Coyote is just one of many species of wildlife found in Crothers' Woods.







# *Appendix B: Guiding Principles for Trail Management Strategy*





## Guiding Principles for Trail Management Strategy

The following are general guiding principles for Trail Management Strategy which may be applied to other parks and natural areas throughout the City of Toronto with similar trail use to Crothers' Woods.

### Management Zones

Management zones provide a targeted system in which a specific suite of objectives can be met or management requirements implemented within defined limits. For the City's park and natural areas, management zones can be established to assist in the design of trails and to help manage habitat. For example:

For trails, zones can be defined and related to:

- Natural heritage conditions related to the suitability for trails, including areas where trails should be prohibited, or where existing/on-going disturbance could accommodate trail uses (e.g., hydro transmission easement where on-going vegetation maintenance results in continued disturbance);
- Design and construction criteria, and maintenance requirements; these zones may well mirror zoning related to ease or difficulty of use; and,
- Locations where site remediation and/or decommissioning of trails should occur.

For vegetation habitats, zones can be defined and related to:

- Priority areas for invasive species management;
- Habitat restoration areas addressing

existing problems (erosion, loss of vigour due to existing levels of use); and,

- Habitat restoration areas identifying locations for naturalization / diversification, including the addition of new community areas for marsh, forest expansion, and native meadow vegetation types.

Throughout the City, it is recommended that habitat restoration and invasive species management be linked directly to trail design and management so that wherever trail improvements are made, opportunities for habitat restoration should also be investigate and implemented when feasible.

### Management Zone Components

A first approximation for management zones for the park can be accomplished through the overlaying of the topographic, drainage and other physical terrain information on the vegetation habitat types and an analysis of this integrated natural heritage information base.

For this purpose, the topography of the subject area can be placed into categories based on steepness. The determination of the division points for the topography should relate primarily to the potential environmental implications of a trail (e.g. steepness, erosion, exposed soils).

For example, suitable steepness categories may be:

- Up to 5%: minimal impact on trail design/minimal erosion.
- Between 5% and 15%: Special trail design considerations may need to be considered.
- Greater than 15%: most prone to erosion, best to avoid or design trails to follow contours.

The figure would be annotated with other terrain





features (e.g., drainage). Then, this categorized map-based information can be overlaid onto the vegetation ELC mapping. This would produce a figure that could highlight zones, as follows:

- Vegetation types to be avoided (e.g. wetland units);
- Woody vegetation types and steep slopes where any trails, paths, would have to follow the contours;
- Drainage impediments; and,
- Water crossing constraints.

The establishment of the vegetation management zones can be accomplished only after the completion of exercises to identify priority locations for invasive species management.

### **Invasive Species Management**

The “Strategic Plan for Managing Invasive Plants in Southern Ontario” (Donna Havinga and the Ontario Invasive Plants Working Group, 2000) outlined eight key strategies to address invasive species:

1. Prevent further introduction.
2. Develop guidelines for managing priority species.
3. Identify priority geographic areas for management.
4. Conduct research and disseminate results.
5. Educate and communicate widely.
6. Develop or revise policies and laws.
7. Develop action programs.
8. Promote partnerships.

For direct application in the City’s natural areas, strategies 1, 2, 3, 7 and 8 should be implemented, and tailored to the specific conditions in the subject area. As well, a component of a successful program is habitat restoration, as discussed subsequently.

The recommendations in the “Strategic Plan” document should be followed. In addition to outlining action direction, it provides specific instructions related to “Criteria for Determining Priority Geographic Areas,” a listing of “Priority Invasive Plants in Southern Ontario;” and specific “Control Methods for Some Priority Species in Southern Ontario.”

Some of the information outlined below is taken from the “Strategic Plan” document.

### ***Prevention of Further Introductions of Invasive Species***

In many of the City’s natural areas, the presence of invasives is already high and the prevention of further introductions may not seem a priority. However, in concert with prepared action plans and partnerships, people can be made aware of problem species and the need to adopt ecologically sound environmental planting requirements in their own residences or around buildings in the vicinity of the Woods.

As well, all restoration planting should consist of only locally sourced native plants. In areas where action is taken towards removal of invasive species, a comprehensive habitat restoration planting plan must be implemented to prevent further spread or re-invasion of problem species.

Because of the extensive nature of the coverage of invasive species in the City’s natural areas, it is not recommended that transplanting of specimens occur. The soil in the root ball of transplanted specimens likely will be contaminated with invasive species. Cuttings and bare root transplanting may be appropriate, if carefully undertaken.

### ***Effective Management of Priority Species***

1. The first step for successful management of invasive species is to ensure that the appropriate individuals understand what are considered to be problem species, and can identify these species. At a minimum, a handout illustrating

the prominent invasive species should be prepared for distribution to the appropriate people. This group would include Parks and Recreation personnel, including those individuals involved in the bike/trails program. Much of the information presented in the City Urban Forestry Services “Forestry Facts #3” presents a foundation for the handout, or in the interim could be used as the handout.

2. A handout should be made available to users of the trail system, likely through various organizations, to assist in partnering with agencies in the control of invasives. As well, individuals and groups should be encouraged to identify additional problem species.
3. Individuals and groups could participate in invasive species control using manual methods, with the chemical methods left to the agencies. Manual methods include cutting, pulling, digging, and smothering. Staff and volunteers should be trained in species identification and the most effective control methods.
4. There should not be an expectation that the invasive species will be eradicated. It may be necessary in some areas to have multiple treatments, regardless of the technique, to reduce the presence of species to an acceptable level.
5. Where the treatment would result in a substantial loss of natural cover in an area, or where it may reduce edge vegetation, it is important that a comprehensive habitat restoration planting plan be developed and implemented to accompany the treatment. Bare ground is an invitation to adventive invasives. In some cases it may be necessary to plant a nurse species to discourage the reintroduction of invasives.

### *Priority Areas for Invasive Plant Management*

Dealing with all of the locations exhibiting substantial invasive species may not be feasible in the immediate future. A priority area list should be developed. Detailed delineation of target areas within the vegetation units also will be required. Efforts should be focussed where most appropriate, where they are most needed, and where success is most likely.

Locations that would be appropriate for inclusion in the priority area list if invasives are present include:

- along the edge of woodlands or where openings have been created in the woodlands;
- in the vicinity of where new activities may occur, for instance where a trail may be created;
- where a trail may be decommissioned; and,
- along existing trails, both for the comfort of the users (e.g. stinging nettle) and so that users do not inadvertently become conduits for the dispersal of seeds, etc.

### *Encourage and Support Direct Action towards Managing Species, including Partnerships for Management*

An on-going program to address invasive species should be implemented as part of the regular management program for the trails.

In addition to the requirements presented above, groups partnering for use of the trails (bikers, hikers, school groups) should be encouraged to participate in this endeavour.

Similar to ‘clean-up’ programs, invasive species control days could be established. As well, when



work parties are organized for trail maintenance, a component of all such activities should be manual removal of invasive species. However, removal efforts should be twinned with planting efforts to ensure that problem species do not reinvade.

People should be sensitized to notice invasive species and directed to eradicate them when they first appear.

## Habitat Restoration

A number of objectives can be met through habitat restoration, including:

- Addressing disturbed areas;
- Invasive species management;
- Enhancing diversity of vegetation community types;
- Bolstering the distribution of species of conservation concern; and,
- Enhancing wildlife habitat.

Priority management zones and priority areas for invasive species management can be the target locations for habitat restoration.

Appendix G of the “Toronto and Region Terrestrial Natural Heritage System Strategy” (TRCA, January 2007) entitled “Natural Heritage Restoration Plan Guidelines” can assist in developing a restoration master plan, which would be beneficial for the entire area, or in implementing a specific restoration project.

For the City’s natural areas, habitat restoration should be focussed at two scales:

- Small, isolated areas of restoration tied to endeavours such as closing trails or treatment of locations for invasive species; and,
- Larger areas of restoration to diversify and enhance the natural areas system.

For the small areas, the plan for the restoration area should be in keeping with the immediate environs. For example, if the vicinity is wooded, then the species, planting techniques and management techniques should relate to forestry restoration; or, if the location has been identified as a meadow that should persist, then suitable forb and graminoid species should be the focus of the planting plan.

## Habitat Restoration Guiding Principles

1. Tree and shrub species should be chosen from the City of Toronto native tree and shrub species lists and acquired from native stock sources. Where the subject area is within the Carolinian zone, the planting plans should include a high preponderance of species restricted to this area. The species mix should reflect the forest type that currently exists. However, Carolinian species should be added, but should include only those native Carolinian species indigenous to the area.
2. Where cultural meadow exists, areas could be identified for establishment of a native meadow community. Given the high proportion of invasive species in these areas, this may require cutting the vegetation off at the base, removal of materials from the site, and the addition of clean soil. In defined locations, consideration could be given to introducing floral species that would be attractive to a specific suite of species (e.g. butterflies).
3. Additional habitat diversity should be encouraged by expanding and improving upon the wetland communities on the valley floor and in the vicinity of the river, or where seeps may be identified adjacent to valley walls (MAM, MAS), or where ponding exists in former channels.
4. Where no diverse vegetation is present or being retained, planting densities



should be as proscribed by the TRCA: 1 tree whip every 5 m on centre and 1 shrub every 1 m on centre. Where some vegetation exists and is being retained, the planting density should be reduced to reflect this.

5. Where there is a likelihood that adventive species will invade, it may be necessary to plant a ground cover nurse species while the other specimens mature.
6. Locally sourced native plants should be used.
7. Appropriate monitoring of the planted materials should occur, including watering, until the specimens are well established.
8. Additional features can be added throughout the natural area to enhance wildlife habitat, including boulder trains and log piles.





# *Appendix C: Guiding Principles for Trail Design*







## Guiding Principles for Trail Design

A number of considerations need to be given to the design of the trail system to ensure a safe and enjoyable network of trails is provided which meets user needs without placing undue harm on the natural environment.

### Access:

1. Establish easily and safely accessible formal entry points to the designated trail system.
2. Access points will serve as gathering places and critical areas to communicate with trail users to address safety and risk issues, promote community engagement opportunities, and provide educational messages about the parkland they are visiting.
3. Parking, transit access, land ownership, and proximity to other trails and services should be considered when determining access locations.

### Signage:

1. Develop and implement a comprehensive signage program to include trail head signage with safety messaging, directional signage, interpretive signage and regulatory signage.
2. Draw on unique features of the environment of each trail network for diversified themes for interpretive signage installments.
3. Ensure by-law regulations are included in messaging for regulatory signage.

### Surfacing:

1. Establish exposed mineral soil natural surface trails wherever possible to reduce construction and maintenance

costs and prevent introduction on non-native materials into natural environment parkland.

2. Limit the use of gravel surfacing to flat, high traffic areas such as entry points, or relatively flat beginner level trails. Ensure flat trails are crowned to shed water.
3. Incorporate board-walking or rock armouring/stone pitching to traverse low wet areas as necessary.
4. Avoid use of organic material such as wood chips for trail surfacing. Organics retain moisture and lead to erosion and trail proliferation.

### Trail Network Planning:

1. Maintain existing trails as part of the trail network as much as possible. Only re-route where necessary to ensure sustainability.
2. Natural environment protection should take precedence over trail use where they cannot coexist.
3. Detailed vegetation mapping to species level and an assessment of soils, microdrainage and natural features should be undertaken for each area as part of trail network planning to identify positive and negative control points and/or alternative locations for trails. It is imperative that new trails avoid locations where significant and sensitive species occur.
4. Develop local solutions for each trail network. Understand the needs of the local community, while anticipating future use pattern or environmental changes (e.g. new housing development being constructed, clearing of ALHB infested trees, restoration project planning, etc.)
5. Take a collaborative approach to resolving trail issues. Involve stakeholders in decision making.
6. Foster stewardship initiatives. Involve trail users in maintenance and monitoring.
7. Consider current and anticipated future



use of the trail network.

8. Incorporate recreation facilities into trail network wherever possible to link trail users to City facilities, facilitate communication with trail users, increase monitoring of trail use, and facilitate recreation programming on the trails.
9. Incorporate connections with other trails in the area (e.g. paved trails, Discovery Walk trails, etc.)

### Trail design:

1. Incorporate the five key elements of sustainable trail design:
  - The half rule;
  - The 10% average rule;
  - Maximum sustainable grade;
  - Incorporate grade reversals; and,
  - Maintain 5% outslope.
2. Use drainage features such as grade reversals, rolling grade dips and kicks to efficiently shed water off of the trail tread. Avoid the use of water bars.
3. Support multi-use, bi-directional trails wherever possible.
4. Designate the narrowest, lowest impact trail possible, while ensuring safety and user needs are met (e.g. do not develop a 2m wide gravel trail where a 0.75 m. dirt trail may meet demands).

### Safety and Risk Management:

1. Incorporate risk management strategies into signage programs, trail inspection and maintenance regimes, sightline maintenance, trail design, off-leash dog walking areas, filters for all TTFs, presence and location of TTFs.
2. Work with operations staff, or other responsible unit(s), to undertake regular inspections of trails and structures to develop a comprehensive check list for inspections and protocol

for responding to maintenance needs. Consider enlisting support of trail users to inspect and report on trail and structure conditions.

3. Repair, close or remove unsafe trails or features promptly. Sign any changes to the trail network to inform users of different conditions or routing.
4. Develop trail construction standards for natural environment parkland trails in consultation with all relevant stakeholders including Legal and TRCA.
5. Work with by-law to undertake regular patrols for enforcement of unauthorized activities.

### Technical Trail Features:

1. Establish a designated bike skills park for each trail network area that exhibits a demand for such a facility.
2. Establish an acceptable standard of care for bike skills parks and structures associated with the trail network.
3. Use filters to reduce the possibility of insufficiently skilled users from accessing the feature.

### Off leash Dog Walking:

1. Establish a designated off leash-dog walking areas for each trail network as necessary to meet the demand.
2. The goal of an off-leash dog walking area should be to provide a space for off-leash dogs where impact to the natural environment can be avoided. Within natural areas, existing disturbed areas may possibly be appropriate locations for such an activity.
3. Maintenance programs should be developed to manage the impact of dogs and dog-walkers/owners on designated off-leash areas.
4. Off-leash areas should be fenced and signed.
5. Off-leash dog walking should not be

permitted on natural environment parkland trails where on-trail use is required. Off trail use by people and dogs is/should be prohibited in order to protect the natural environment.







# Glossary

## **Alluvial Plane**

A plane underlain by fluvial deposits, including alluvial (fluvial) fans, and lacustrine deposits (stream-transported materials that have accumulated in lakes).

## **Anthropogenic**

Originating from the activity of humans.

## **Bench Cut**

A relatively flat, stable surface (tread) on a hillside made by excavation. When excavated often referred to as full, half or partial bench.

## **Carolinian Zone**

The Carolinian Forest Region contains tree species common to parts of the United States but rare in Canada. These species grow only in the southernmost part of Ontario, mostly on the northern shore of Lake Erie. The unique mix of climate and moist yet well-draining soils in the Carolinian-Canada life zone allows for a surprising array of deciduous trees in the region. Osage orange, redbud, sycamore, sassafras, and tulip tree can grow here, but almost nowhere else in Canada.

## **Doubletrack Trail**

A trail that allows for two users to travel side by side, or to pass without one user having to yield the trail.

## **Ecosystem**

1. A complex system of living organisms (plants, animals, fungi, and microorganisms), together with their abiotic environment (soil, water, air, and nutrients) that function together to circulate nutrients and create a flow of energy which creates biomass, a trophic structure in the living community, and a change in ecosystem form and function over time.
2. A unit of land or water comprising populations of organisms considered together with their physical environment and the interacting processes between them; for example, marsh, watershed, or lake ecosystem. Any one ecosystem has relative uniformity in the composition, structure, and properties of both the biotic and abiotic components and their interactions. Ecosystems do not have boundaries fixed in time or space, since their component parts are in a constant state of flux and can change rapidly or slowly, depending on prevailing environmental factors.

## **Environmentally Significant Area (ESA)**

In regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history.

## **Fall Line**

The direction of water flows down a slope (path of least resistance) under most circumstances.



Constructing a trail on the fall line encourages water to run down the trail and leads to erosion.

### **Forb**

A herbaceous plant with broad leaves, excluding the grasses and grasslike plants (e.g. buttercup, sunflower).

### **Glaciolacustrine**

Pertaining to glacial lakes.

### **Grade Reversal**

A reversal in the trail grade - usually a short dip followed by a rise - that forces water off the trail. Grade reversals are known by several different terms, including grade dip, grade brake, drainage dip, and rolling dip. Frequent grade reversals are a critical element of sustainable trail design. Most trails will benefit from grade reversals every 6 to 15 metres, depending on soil type and rainfall.

### **Graminoid**

Grasses and grasslike plants, such as sedges.

### **Groundtruthing**

In inventory work, checking on the ground at the site observed and/or measured, data and observations made from aircraft, satellites, other aerial platforms, aerial photographs, or maps. The aim is to verify what has been observed is actually what exists on the ground. Groundtruthing is usually undertaken by sampling points on the image and correlating these to ground conditions. Groundtruthing helps to refine and amend image interpretation.

### **Habitat**

1. Those parts of the environment (aquatic, terrestrial, atmospheric), often typified by a dominant plant form or physical characteristic, on which an organism depends, directly or indirectly, in order to carry out its life processes.
2. The specific environmental conditions in which organisms thrive in the world.

### **Herbaceous**

Vegetation that is usually forbs, grasses, or leafy plants.

### **Infrared Photography**

Electromagnetic radiation with wavelengths between 0.75 micrometres and 1 millimetre. Infrared radiation (IR) lies just beyond visible red light and is usually classified as near and far infrared. Near IR encompasses the shorter wavelengths from 0.7 micrometres up to 2 or 3 micrometres and emphasizes the radiation reflected from plant materials. It is also called solar IR because it is only available for use in daylight hours. Far IR encompasses the longer wavelengths from 25 micrometres to 1 millimetre, but this is limited in terrestrial survey applications because the atmosphere transmits very little radiation in these wavelengths. Much of the infrared radiation arriving at the Earth's surface is absorbed by water vapour. However, the near IR is used extensively for satellite and low-level flight inventories mapping vegetation, since the condition of the vegetation has different reflectance properties and can be calibrated to vegetative conditions.

**Invasive Species**

Non-native, opportunistic species.

**Lacustrine Soil**

Pertaining to lakes.

**Maximum Sustainable Grade**

The steepest section of a trail. (The section must be more than 3 metres in length)

**Natural Heritage Features and Areas**

Features and areas, including significant wetlands, significant coastal wetlands, fish habitat, significant woodlands south and east of the Canadian Shield, significant valleylands south and east of the Canadian Shield, significant habitat of endangered species and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscapes of an area.

**N.E.C.P.**

Natural Environment Community Programs, City of Toronto.

**Orthophoto**

Images based on air photos, but which are true to scale and free of distortion. Orthophotos resemble air photos but, in fact, are maps.

**Physiognomic**

The form and structure of vegetation in natural communities.

**Physiography**

Pertains to the factors that influence the development of landforms or a landscape, such as relief and topography, bedrock geology and structure, and geomorphological history.

**Side Slope**

The natural slope of a hillside measured on the fall line.

**Silt**

1. Soil inorganic particles between 0.004 and 0.062 millimetres in diameter (i.e. between clay and sand).
2. A soil textural class in which silt particles are very abundant.

**Singletrack Trail**

A trail designed for single file travel.

**Stacked Loop System**

A trail system incorporating diverse trail styles.

**Stereo Airphoto**

In aerial photograph interpretation, two photographs taken from adjacent parts of a flight line can



provide a stereoscopic image (appears to be three-dimensional to the viewer) when the photographs are correctly aligned.

### **Topography**

The relative position and elevations of the natural or human-made features of a landscape, used to describe the surface configurations.

### **The 10% Average Rule**

Generally, an average trail grade of 10% or less is most sustainable. This does not mean that all trail grades must be kept under 10%. Many trails will have short sections steeper than 10%, and some unique situations will allow average trail grades of more than 10%.

### **The Half Rule**

A trail's grade shouldn't exceed half the grade of the side slope. If the trail grade is steeper than half of the side slope, it is considered a fall-line trail and gravity will pull water down the trail instead of across it. This leads to erosion of the trail tread.

### **Trail Creep**

Describes a contour trail sagging or sliding down the hill due to user-caused erosion. Specific causes include bushes or trees protruding into the trail from above, exposure of roots from an uphill tree, an improper bench cut, or poor trail flow.

### **Tread Outslope**

A method of tread grading that leaves the outside edge of a hillside lower than the inside to shed water. The outslope should be barely noticeable - usually no more than 2.54 centimetres of outslope for every 45.72 centimetres of tread width (or about 5%).

### **Tread Slope**

The slope of the actual surface portion of a trail upon which users travel.

### **Vascular Plant Species**

Plants having well developed vascular components (xylem and phloem) capable of transporting water, sugars, nutrients, and minerals between the absorbing tissue in the roots and the photosynthesizing tissue in the leaves.

### **Whip**

A whip is a slender, unbranched shoot or plant. This term is used in forestry to refer to unbranched young tree seedlings 0.5-1 m tall and 2-3 years old that have been grown for planting out.