

GREEN TIMBERS URBAN FOREST RECREATION AND ACCESS MANAGEMENT PLAN

Prepared for:

The City of Surrey
Parks, Recreation and Culture Department
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December 2002

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Executive Summary

Green Timbers Urban Forest (the Forest) is a 185 hectare park located within the City of Surrey. It was dedicated in 1988 and 1996 largely in response to the efforts of the Green Timbers Heritage Society and other organized groups that recognized its unique history, ecological characteristics and recreational opportunities. The popularity of this area has increased dramatically over the past decade and will continue with the development of the City of Surrey. This pressure threatens to increase the degradation of the Forests ecology and increase the number of conflicts between user groups.

The City of Surrey Parks, Recreation and Culture Department is committed to protecting the ecological integrity of the Forest while providing for adequate recreation opportunities. This Access and Recreation Management Plan serves as a strategic document that provides direction for the management of the Forest. All of the objectives and principles within this plan are consistent with the City of Surrey Natural Areas Access and Recreation Management Strategy as well as the City of Surrey Parks, Recreation and Culture Commission Policy Manual. This plan proposes specific actions that address the access and recreation concerns of the public and Forest stakeholders while preserving the ecological integrity and heritage values of the Forest.

An ecological inventory of the Forests stands, vegetation and ecological site series was developed and entered into a Geographic Information System. This inventory was used to identify any rare and endangered plant communities, plant species and wildlife habitat. There are currently no red (endangered) or blue (threatened) listed plant communities within the Forest although there are a number of areas that will eventually develop into these plant communities once they have matured into old growth forests. The most sensitive ecosystems within the Forest are the wetlands, riparian ecosystems and those forests with high moisture regimes.

There were no rare or endangered plant species identified although the abundance of wet forest types and wetlands provides the habitat for many of these rare species. There are a number of red and blue listed wildlife species which have been identified in the forest and a number of others which could potentially inhabit the Forest but have not yet been identified. The Forest is unique in that it contains a wide diversity of wildlife habitat types from the open meadow to mature coniferous forest and open wet deciduous forest. Also the presence of the lake and creeks ensures a constant water source. The preservation of this diversity of habitat types will ensure opportunities for a wide range of wildlife species.

None of the large mammals such as the black tailed deer that used to inhabit this Forest have been identified recently. There is a growing concern that urban development adjacent to the Forest and fragmentation of the forest by the three roadways is preventing these species from surviving here. The area south of the B.C. Hydro right of way and east of 144th St. is designated as an environmental protection/wildlife refuge area. Proposals to remove 144th St between 92nd Ave and Fraser Highway and to provide for wildlife connections across the Fraser Highway would greatly improve the wildlife opportunities in this area.

The majority of the authorized and unauthorized trails are located north of 96th Ave. as this is by far the most frequently used portion of the forest. The classification of these trails is inconsistent with the current uses and planning for recreation needs. Additionally there are numerous unauthorized trails only some of which serve a purpose. Recommendations have been made to establish a definitive authorized trail system that is classified appropriately to meet the recreation pressures. These recommendations also include building two new trails south of 96th Ave. in order to improve access and encourage more visitors to use this portion of the Forest.

The current signage system in the Forest is often wordy and varies in text, fonts, sizes, supporting posts and colors. A standardized signage system is recommended that will attempt to eliminate these problems while minimizing the number of signs posted. Additionally,

recommendations have been made to ensure there are adequate facilities such as parking, gating, garbage containers, street safety and toilets for those that visit the Forest.

The conflicts that exist between user groups in the Forest have been researched through extensive public consultation and interviews with relevant agencies and organizations. There is currently a low incidence of conflict between the various user groups. The greatest conflicts to date include dog owners who do not leash or clean up after their dogs and degradation of native flora in sensitive ecosystems. There have been relatively low incidences or concerns involving bicyclists.

In order to manage and prioritize the recommendations made in this report, the Forest has been stratified into distinct recreation and access management zones. Within each of these zones, the most critical factors affecting access management have been identified and management strategies recommended. These include the ecological carrying capacity of the site, the signage and facility requirements as well as the associated risks. The following figures and tables summarize and prioritize the recommendations made within this management plan.



Green Timbers Urban Forest Recreation and Access Management Zones

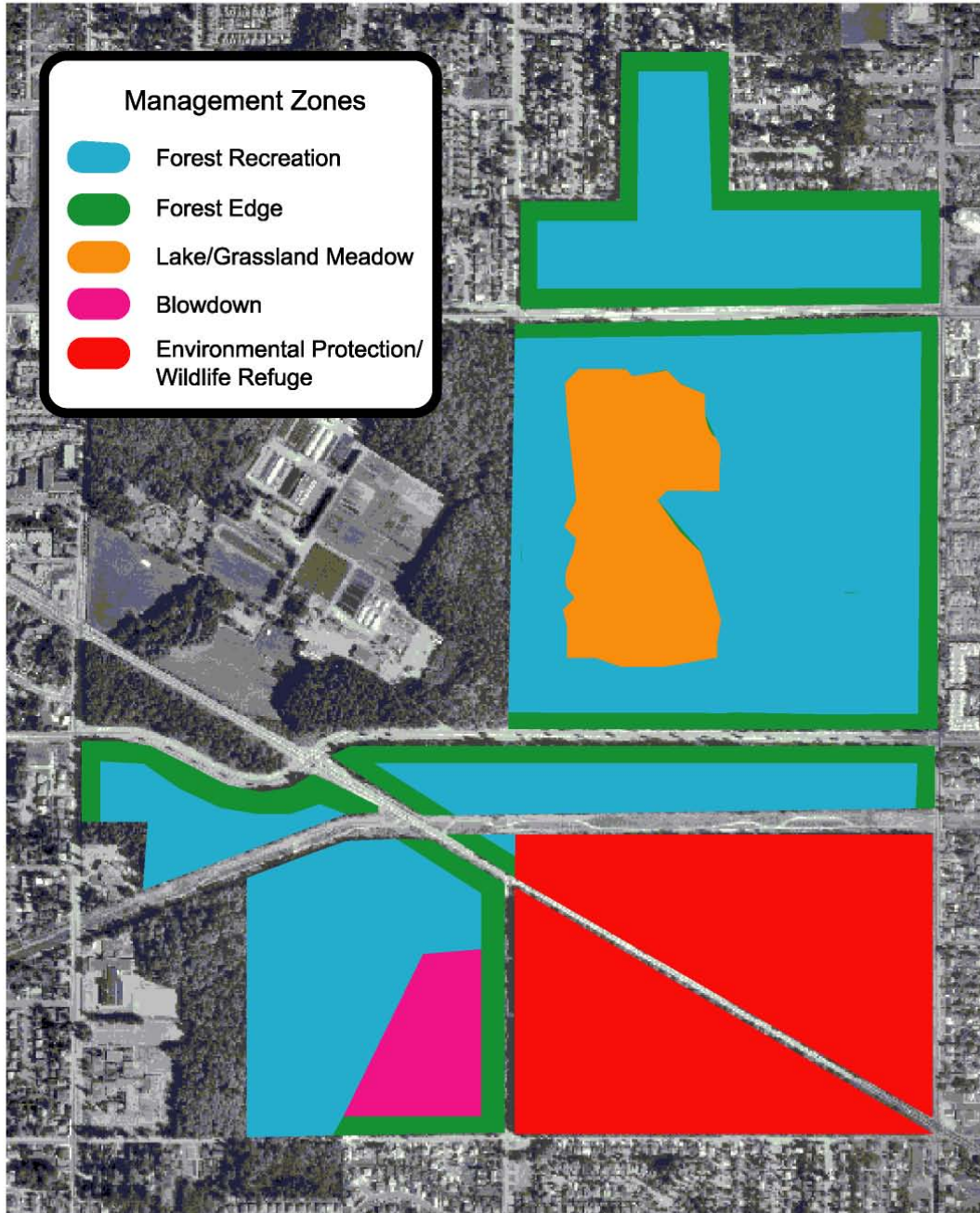


Figure 1 Recreation and Access Management Zones

Table 1 Summary of recommendations

Management Zone	Primary Concerns	Recommended Actions
Lake/Meadow Area	<ul style="list-style-type: none"> • The meadow is not a natural plant community for this climate • Natural drainage patterns are being altered to produce the lake and wetlands • The higher moisture levels in the wetlands make the existing trails prone to erosion faster than trails in other areas of the Forest • Off trail use is causing damage to the sensitive plant communities • Lake visitors and dogs are trampling riparian vegetation on the eastern and southern sides of the lake • Introduced non-native species could drastically alter this ecosystem • Dogs off leash and people walking off the trails are making numerous unauthorized trails through the meadow • There are no areas for small mammals and rodents to hide or nest in the meadow • 	<ul style="list-style-type: none"> • Make changes to the trails in this zone as per the trails section of this document • Upgrade the signage as per the signage section of this document • Scatter large coarse woody debris to improve cover for wildlife • Install artificial roosting sites for birds of prey • Plant a few Douglas-fir in the meadow opening • Continue to remove newly established trees in the meadow so that a forest canopy does not take over. • Monitor this zone more frequently than the rest of the Forest for the establishment of unauthorized trails and dogs running off-leash • Restore native species along eastern and southern banks of lake. • Public education must include the impact on non native species have on the flora and fauna of the lake, meadow and wetlands
Blowdown area	<ul style="list-style-type: none"> • There is a hazard of trees falling on visitors using this area • Trails frequently require maintenance to remove windthrow following a storm • Fallen trees are contributing to heavy fuel loads and subsequently a high fire hazard • Recently used fire pits were found in south end of this zone • King Creek and its riparian zone are being degraded by people and dogs traveling off trail 	<ul style="list-style-type: none"> • Make changes to the trails in this zone as per the trails section of this document • Upgrade the signage as per the signage section of this document • Post signs warning of the dangers of traveling in this area • Monitor the trail for hazard trees and windthrow following windstorms • Rehabilitate the fire pits and party areas at the south end of this zone • Install fencing and rehabilitate the areas where the riparian zone of King Creek has been degraded
Environmental Protection/ Wildlife Refuge zone	<ul style="list-style-type: none"> • There are a number of unauthorized trails being used throughout this area • There have been numerous attempts by Parks Division staff to close and decommission trails in this area with little success. • This area is frequented by youth that set up temporary shelters, light bonfires and leave garbage behind • This part of the Forest is highly fragmented by roads and therefore does not attract large mammals • There are no signs stating that this area is an Environmental Protection Zone/Wildlife Refuge • There is a significant amount of dumping and resulting invasive species growth in the sections adjacent to 92nd Ave. and 	<ul style="list-style-type: none"> • Make changes to the trails in this zone as per the trails section of this document • Upgrade the signage as per the signage section of this document • Monitor the non-sanctioned trails in this area for trespassers • Monitor this area to ensure for sign maintenance more often than in other areas of the Forest • Deliver pamphlets to residents adjacent to the Forest regarding the ecological sensitivity of this area and the damage caused by illegal dumping • Remove all non-native plant species along 92nd Ave and 144th St. • Dismantle and remove all shelters and fire pits built by party-goers. Rehabilitate these areas by replanting native plant

	<p>144th St.</p> <ul style="list-style-type: none"> • There are numerous tree hazards adjacent to roadways and sidewalks 	<p>species</p> <ul style="list-style-type: none"> • Decommission 144th St and restore the native ecology • Erect a wooden fence along 92nd Ave. to prevent dumping and restrict access • Install wildlife/pedestrian overpass/underpass across Fraser Highway • Regularly inspect roadways for tree hazards
<p>Forest recreation Zone</p>	<ul style="list-style-type: none"> • This area contains wetlands and sensitive ecosystem types • There are a number of degraded ecosystems such as the west side of Moss trail and the riparian vegetation adjacent to King Creek • Dogs are being left to run off-leash and their owners are not cleaning up after them • Some bikers are riding too quickly and out of control • Sensitive ecosystems are being damaged by off trail use • Higher moisture levels in certain areas make some of the trails more prone to erosion • There is no proper crossing of King Creek along Lady Fern Trail • The Eastern White Pine plantation is not a native species for this climate, is in poor health and is a significant fire hazard 	<ul style="list-style-type: none"> • Make changes to the trails in this zone as per the trails section of this document • Upgrade the signage as per the signage section of this document • Ensure wetlands are protected by building boardwalks or placing gravel where trails are consistently wet • Place gravel along the western portion of the Moss trail and rehabilitate the understory vegetation. • A small foot bridge should be built over King Creek along the Lady fern trail • Produce and distribute educational brochures regarding trail etiquette to enforce regulations and minimize conflicts • Monitor the wetter ecosystems for degradation more frequently than the rest of the Forest. • Reduce the fire hazard in the Eastern White Pine stand and propose a plan to restore this area to a native ecosystem
<p>Forest Edge Zone</p>	<ul style="list-style-type: none"> • This area contains a number of invasive brush species that threaten the native ecology of the Forest • There is considerable illegal dumping of garbage and garden waste • There are numerous trailheads to unauthorized trails • There are numerous tree hazards adjacent to roadways and sidewalks • There is garbage accumulating from adjacent traffic and pedestrians 	<ul style="list-style-type: none"> • Make changes to the trails in this zone as per the trails section of this document • Upgrade the signage as per the signage section of this document • Aggressively remove all non-native species from this area • Establish volunteer groups that can perform a gradual clean-up and maintenance program for the forest edge • Educate the local residents regarding the impacts of dumping garbage and garden refuse in the Forest. • Consult with volunteers and interest groups involved with the Forest to ensure that illegal dumping is reported to the Parks Division • Erect a wooden fence along 92nd and 101st Avenues to help prevent dumping • Regularly inspect roadways for tree hazards

Table 2 Prioritization of recommendations

Signage	Trails	Facilities	User groups	Other
<ol style="list-style-type: none"> 1. Remove old signage and replace them with recommended signs as per the signage section of this document 2. Install the new signage theme on standardized posts as outlined in the signage section. These signs should include: <ul style="list-style-type: none"> • no entry signs adjacent to ecologically sensitive areas and at the entry to unauthorized trails • Environmental protection/Wildlife refuge signage • an updated map of the Forest and its facilities and trails in the kiosk • trail closure signage • trail name signs • signs informing dog owners to leash and clean up after their dogs • wildlife feeding signs • no dumping of waste signs • signs regarding trail etiquette in the Forest • a shared trail sign • signs regarding the associated risks of using the Forest • fire hazard and awareness signs • educational material in the kiosk • interpretive trail signs 	<ol style="list-style-type: none"> 1. Upgrade the classification of the trails as per the trails section of this document 2. Authorize trails as per the trails section of this document 3. Close all unauthorized trails as follows: <ul style="list-style-type: none"> • Those running through King Creek between Sword Fern trail and King Creek trail • Those in the Environmental/wildlife refuge zone • The trails running through the blowdown area • Any trails running through the wetter ecosystem types (site series 12) • All other unauthorized trails 4. Follow the guidelines outlined in the NAARMS for trail closures 5. Close King Creek Trail during wind storms and put up signs indicating the hazard and the trails closure 6. Place no entry signs at or near unauthorized trailheads indicating trail closures 	<ol style="list-style-type: none"> 1. Install a small bridge to cross King Creek along Lady fern trail 2. Encourage the development of pedestrian/wildlife crossings for 100th Ave 96th Ave and Fraser Highway 3. Erect a wood fence along the north side of 92nd Ave. and south side of 101 Ave to discourage dumping and access 4. Upgrade the Kiosk as follows: <ul style="list-style-type: none"> • Designate a small area where the public can post information pertaining to the Forest and community involvement. • Install an updated map of the Forest, its authorized trail system and facilities • A box should be attached to the Kiosk providing bags for dog waste • Post map at the kiosk showing locations of Tynehead and Freedom Parks off leash areas 5. Maintain the garbage containers around the lake area and provide two more garbage containers at the intersections of the Salal trail with the Douglas-fir and Cedar trails 	<ol style="list-style-type: none"> 1. Dismantle and remove all shelters and fire pits built by party-goers 2. Monitor the level of conflicts between user groups in the Forest using a log book 3. Deliver pamphlets to residents adjacent to the Forest regarding its ecological sensitivity 4. By-law enforcers should visit the lake area more often than other areas of the Forest for off-leash dogs 5. Consider the use of a dog-waste management company or have volunteer groups stock bag supplies at the kiosk 6. An effort should be made to better educate representatives of all user groups regarding the impacts of off-trail biking 7. The Forest brochure should explain the degradation that a bike tire causes to trails. 	<ol style="list-style-type: none"> 1. Establish volunteer groups to assist the Parks Department staff 2. Rewrite the Forest brochure to include information on trail etiquette, education material regarding rare and endangered plant and animal species, an up to date trails map, trail risks and an interpretive guide 3. Reduce fragmentation of the Forest by decommissioning 144th St. 4. The Parks Department must issue a special use permit for events involving more than 20 participants 5. Develop a website to post information regarding the Forest

	<ol style="list-style-type: none"> 7. Name all trails as per Figure 13 and 14 8. Develop an official trails map 9. Produce an annual inventory of all unauthorized trails and a prioritized plan for decommissioning them 10. Create the three proposed trails south of 96th Ave (the Lilly and Ferris trail and the Ferris trail access to the King Creek trail) 11. Inspect and maintain all trails as stated in the Natural Areas; Access and Recreation Management Strategy 12. Monitor trails during peak seasons for off-trail use, bylaw infractions and trail etiquette violations 		<ol style="list-style-type: none"> 8. Consider developing a bicycle loop that has optional, adjacent off-road trails 	
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Introduction

The protected natural areas and parks within our urban centers are being put under increasing pressure as our population base continues to grow. Development is removing more of our natural ecosystems making the proper management of the protected areas critical for the preservation of ecological biodiversity on a regional and provincial scale. A variety of user groups, pursuing a diversity of activities and experiences, are using these natural areas. This often leads to user group conflicts and can threaten the integrity of these ecosystems. For this reason, it is important to identify the pressures put on these protected areas and to develop policies and guidelines for their management that can satisfy all user groups in an ecologically sensitive and sustainable way.

Green Timbers Urban Forest (the Forest) is a 185-hectare park located within the City of Surrey. It was dedicated in 1988 and 1996 largely in response to the efforts of the Green Timbers Heritage Society and other organized groups that recognized its unique, history, ecological characteristics and recreational opportunities. The City of Surrey Parks, Recreation and Culture Department is committed to sustaining the Forest and its associated environment in as natural a state as possible. It is recognized that the area cannot be classified as “wilderness” and therefore the natural resources and recreation activities must be managed to protect the ecological integrity of the Forest.

An ecological inventory of the Forest was developed and the critical ecological features were identified which require special management. The current authorized and unauthorized trails and signage were also inventoried and recommendations made based on these ecological features and pressures from various user groups.

The plan was developed with considerable input from the public, Green Timbers Advisory Committee and representatives from specific user groups. A questionnaire was developed for the public in the direct vicinity of the Forest and meetings were organized to discuss the issues with the primary stakeholders. In general there was strong support for protecting the Forest ecosystems and that there be as little change to the Urban Forest as possible.

This Access and Recreation Management Plan acts as a strategic document that provides direction to the Parks, Recreation and Culture Department, Park Division (Parks Division) to address the access and recreation concerns of the public and Forest stakeholders. It outlines specific actions to undertake within the next 5 years as well as general strategies for the long-term preservation of the Forest. It is a public document that will be available for comment and to update in the future in response to the needs and desires of the community.

Park policies, city by-laws and existing management guidelines

It is critical that this plan be consistent with all higher level plans and objectives set forth by the Parks Division. The following is a summary of the policies, guidelines and the guiding principles for park management that have been considered and incorporated into this plan.

Parks like Green Timbers Urban Forest have been “set aside in perpetuity for their intrinsic and heritage values, to provide long term non-consumptive enjoyment and benefits for the general public” (Parks, Recreation and Culture Commission Policy Manual, 1996). This statement emphasizes the need to produce an ecologically sound and sustainable management strategy. Parks Division staff, the Green Timbers Advisory Committee and all user groups have re-emphasized this sentiment throughout this planning process.

Regarding access, this policy manual also states that:

- a) Each local Urban Forest Advisory Committee shall develop a trail system plan to facilitate controlled access to the forest that will be designated and maintained to have minimum impact on the surrounding environment and to preserve the natural character of the area.
- b) Local Urban Forest Advisory Committees may, at their discretion, designate trails for specific uses and may prohibit certain uses. Where trail use puts at risk the enjoyment of others, public safety or protection of the environment, the Local Management Authority will prohibit or segregate use.
- c) Each Local Urban Forest Advisory Committee should set aside areas in which public access is restricted in order to protect the forest from human disturbance.

A citywide Natural Areas Access and Recreation Management Strategy (City of Surrey, 2000) was developed in order to provide guidance to the Parks Division and to the Parks Commission in the management of access and recreation in natural areas parkland. A number of principles were set forth in this plan in order to guide the development of management goals and objectives, preparation of work plans and resolution of associated values. These include:

- Natural areas are valuable ecosystems and must be respected
- Wildlife must be protected in areas unfrequented by people
- Natural areas are for the benefit of the general public and should be shared
- Fragmentation of natural areas must be limited when providing access
- Recreational activities must be compatible with the site and must not unduly impact significant habitats and vegetation
- Recreation activities at a site must be compatible with one another
- Access and recreation activities must be legitimate
- Access and recreation should be planned, monitored and evaluated
- Regulations designed to protect natural areas should be developed and enforced

Based on these principles, specific access and recreation goals were developed for Green Timbers Urban Forest. These are designed to protect and enhance the ecology of the Forest environment while providing recreational opportunities for the community. These principles and goals have been used as a framework for the development of all management recommendations.

Green Timbers Access and Recreation Goals

1. Preserve and protect the ecological integrity of the Forest

The ecosystem of Green Timbers Urban Forest provides critical habitat for many different plants and animals and contains environmentally sensitive areas. In cases where ecological values may be significantly compromised, access and recreation must be controlled, limited or even prohibited.

2. Provide legitimate access and recreational uses of the Forest that meet the needs of Surrey residents of all abilities

The Forest provides a unique environment for people to enjoy a diverse number of nature based activities. From bird watching to bicycling, there is an increase in users of the Forest. Legitimate access and recreation must be planned and provided for in suitable areas, while protecting the ecology, in order to meet the needs of the general public.

3. Provide a high quality trail system for access to and recreation within the Forest

Since access and recreation within the Forest is primarily provided by trails, a high quality neighborhood and community trail system is desirable. A trail strategy should provide the necessary guidance to develop safe access and recreation opportunities while protecting the ecosystem.

4. Comprehensively plan for access and recreational activities in the Forest

This plan should consider access and recreation opportunities, the needs of neighborhoods and communities, and the capacity of the Forest to sustain the desired activities.

5. Involve the public in the planning, design, construction and maintenance of access uses and opportunities in the Forest

Public involvement in the management of the Forest will contribute to the development of high quality services that are relevant to the general public, and that generate public acceptance and satisfaction. Such participation in projects by the community can also create a sense of ownership, and encourage stewardship of the Forest.

6. Prepare and implement maintenance work plans that will ensure the safety of the public and protect the natural environment

Maintenance work plans that will optimize the safety and security of the public should be prepared and implemented by qualified personnel in accordance with Parks Division Standards and Policies. Such plans should include trail inspections that will identify trip hazards and/or hazard trees and actions to correct these problems. When recreational activities damage natural habitat or vegetation, the site should be rehabilitated back to a natural state.

7. Develop and maintain an inventory that will facilitate the Access and Recreation Plan for Green Timbers Urban Forest

This plan provides baseline information on the ecosystems and the location and types of existing recreational facilities (e.g. trails and signs) within the Forest. The inventory should be updated in the future to meet changes in the facilities provided.

Forest Description

The following is a general description of the physical and ecological attributes of the Forest that is relevant to the development of recreation and access management strategies. Emphasis is placed on the unique ecological features and characteristics that require protection.

Location

Green Timbers Urban Forest is located in North Surrey bordered to the east and west by 148th St. and 140th St. respectively. 92nd Ave. forms the southern boundary and the northern portion of the Forest extends up to a residential development around 103rd Ave. (Figure 2) The Forest is dissected by a number of arterial roadways including the Fraser Highway, 96th Ave., 100th Ave. and 144th St.. There is a large forested area located adjacent to and continuous with the north-west portion of the forest, that is owned and maintained by the Forest Service.

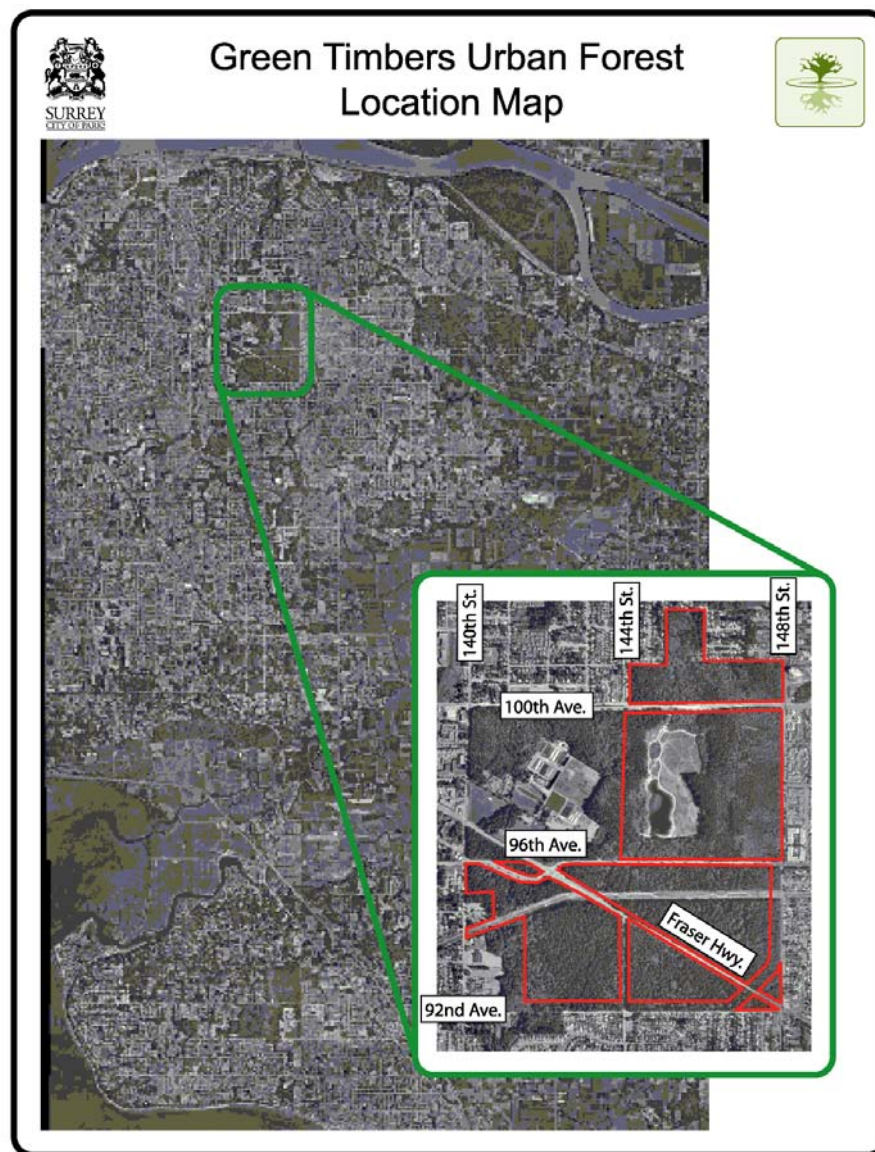


Figure 2 Location of Green Timbers Urban Forest

Climate

Green Timbers Urban Forest is located in the wettest climate in British Columbia. This mild maritime climate creates conditions where average temperatures stay above 10 degrees for 4-6 months of the year. Summers are generally cool and winters are mild with less than 15% of the precipitation occurring as snowfall. According to the Biogeoclimatic Classification System of B.C. (Green and Klinka, 1994) Green Timbers Urban Forest is classified as the Dry Maritime Coastal Western Hemlock Zone (CWHdm). Average climatic characteristics for this subzone are summarized in Table 3.

Table 3 Climatic characteristics of the CWHdm subzone

Mean Annual Precipitation	1827 mm
Mean Annual Precipitation April to Sept	498 mm
Mean Annual Temperature	9.8 degrees
Mean Annual Temp of the warmest month	17.6 degrees
Mean Annual Temp of the coldest month	1.9 degrees

Physiography

The parent material of the lower mainland consists primarily of sediments deposited during the Pleistocene Epoch (25,000 to 11,000 years ago) during a period when glaciers were retreating and areas below 200m in elevation were covered by the sea. These deposits include till deposited directly by glaciers, gravel and sand deposited from streams flowing off the melting ice, marine clay and silt, beach gravel and sand.

According to geological maps, parent materials found in the North Surrey area were formed from primarily marine influences with patches of marine till and sand deposited by the receding glaciers. Consequently, the soils are predominantly thick silts and clays. These fine sediments have been compacted from overlying glaciers making water infiltration very slow. The soils are predominantly classified as Humo-Ferric Podzols according to the Canadian System of Soil Classification. Soil textures are generally sandy loams with a coarse fragment content ranging from 15-40%. Small areas located to the south of the Fraser Highway consist of uncompacted pure loams with no coarse fragments. The soils in these areas were likely formed from sedimentation of small glacial lakes.

Generally, the forest contains flat to rolling terrain with slopes reaching no more than 10%. Therefore, most of the runoff is absorbed by the vegetation on the site or is filtered down through the soils to add to the ground water. Infiltration is slow in most areas due to the fine particles and compacted nature of the soils. This has resulted in a number of poorly drained areas with high water tables. These areas are very wet and swampy and are dominated by deciduous species.

There is one major drainage system running north to south through the Forest. This system originates in a swampy section with braided ephemeral streams north of 100th Ave. This drainage area runs south under 100th Ave. to form a small stream draining into the lake. King Creek drains out of the south end of the lake and runs southwest through the Forest to about 142nd St and 92nd Ave. There are two other small streams located within the Forest. One starts as an ephemeral braided stream at a culvert on the south side of the Fraser Highway just east of 144th St. This stream runs southwest to about 144th St and 92nd Ave. A second stream starts at the east end of 96th Avenue and runs south along the east edge of the Forest to 92nd Ave.

Forest Ecology

Biogeoclimatic Classification of Green Timbers

The Biogeoclimatic Classification System (BEC) is a hierarchical system that stratifies B.C.'s landscape into similar ecosystem types based on a combination of climate, physiography, surficial material, bedrock geology, soils and vegetation. This system consists of a broad regional classification as well as a more specific site classification. The regional classification stratifies the landscape into the basic units of this system called subzones. Within each subzone, specific sites are further classified based on the levels of available moisture and nutrients. An extensive description of this system can be found in the publication *Ecosystems of British Columbia* (Meidinger and Pojar, 1991).

For the purposes of developing management zones and subsequent strategies, similar ecosystem types are grouped together into their dominant site series and stand types as illustrated in Figure 3. These site series classifications are important as they help to identify similar plant communities and determine how they will develop and react to various management regimes. Additionally, they help to identify the location of rare and endangered species, habitats and plant communities. The detailed ecosystem inventory database can be found in Appendix A.

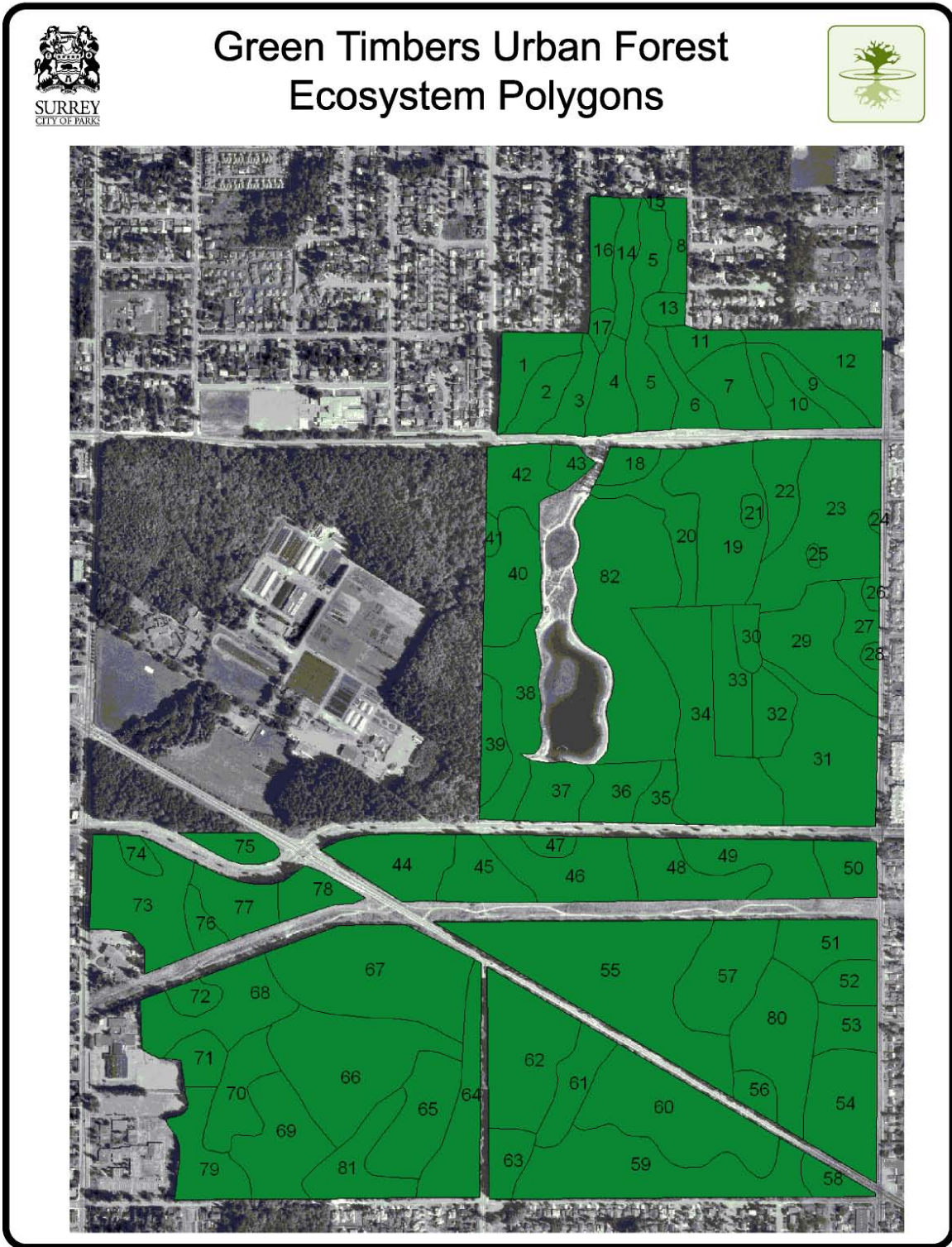


Figure 3 Ecosystem polygons of Green Timber Urban Forest

Biogeoclimatic Subzone Classification of Green Timbers Urban Forest

According to the Biogeoclimatic Classification System of B.C. (Green and Klinka, 1994) Green Timbers Urban Forest is classified as the Dry Maritime Coastal Western Hemlock Zone (CWH dm) but lies just to the north of the transition zone to the drier Very Dry Maritime Coastal Western Hemlock subzone (CWHxm). Due to the proximity of these subzones, the Forest does contain plant communities and ecological characteristics found within the CHWxm.

Site Series and Vegetation

Within the BEC system, subzones are further categorized into units called site series according to the level of available moisture and nutrients in the soils. Plant and tree species have certain moisture and nutrient thresholds and ranges in which they will survive and compete. For this reason, distinct plants communities are characteristic of each site series.

There are four dominant site series found within Green Timbers Urban Forest. Their presence and distribution in the forest is summarized in Table 4 and illustrated in Figures 4 and 5.

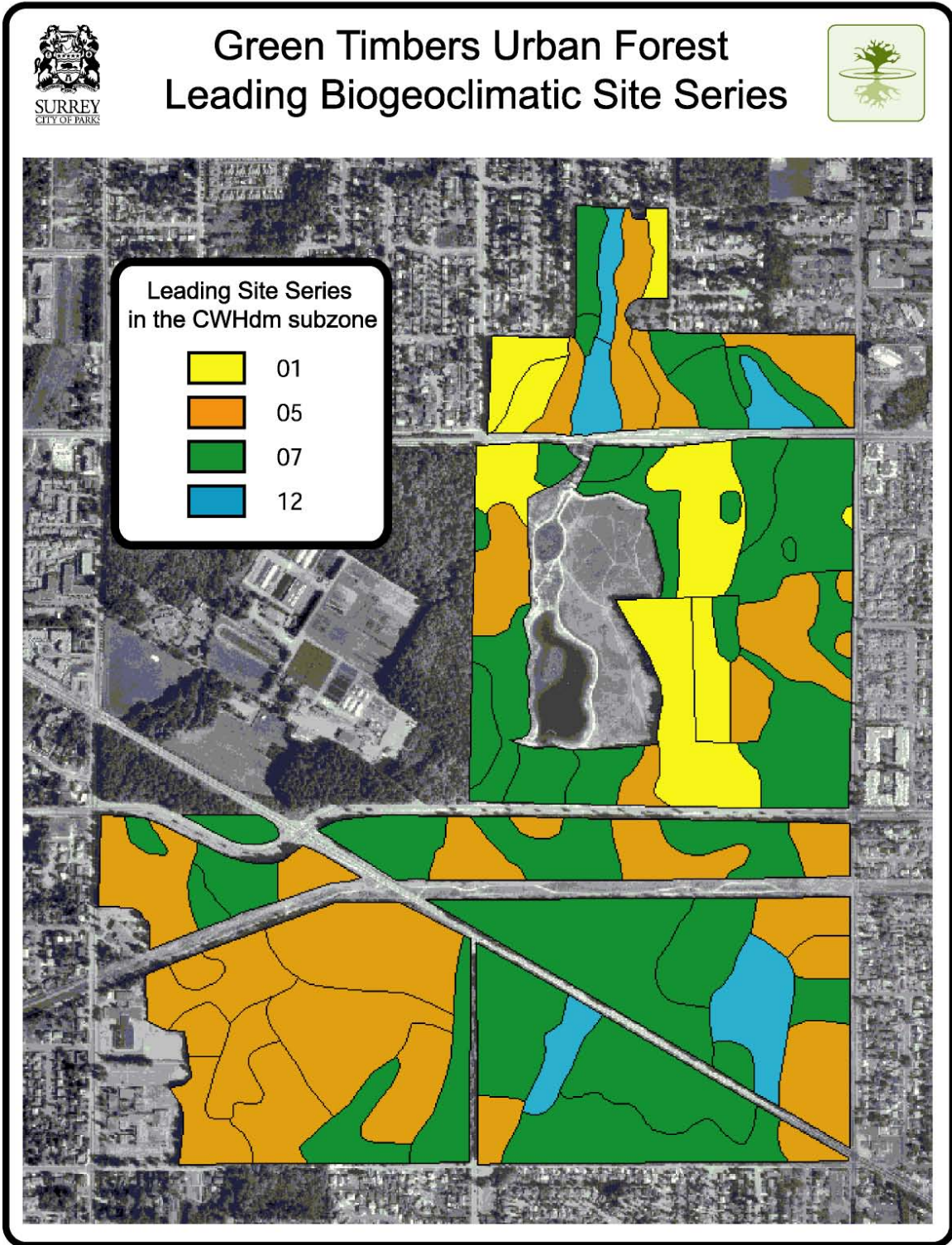


Figure 4 Site series distribution in Green Timbers Urban Forest

Table 4 Summary of dominant site series

Site Series	Soil Moisture Regime 0 (driest) to 7 (wettest)	Soil Nutrient Regime A (very poor) to E (very rich)	Area (ha)
01	3-4	B-C	18
05	3-4	D-E	63
07	5-6	D-E	78
12	7	C-E	9

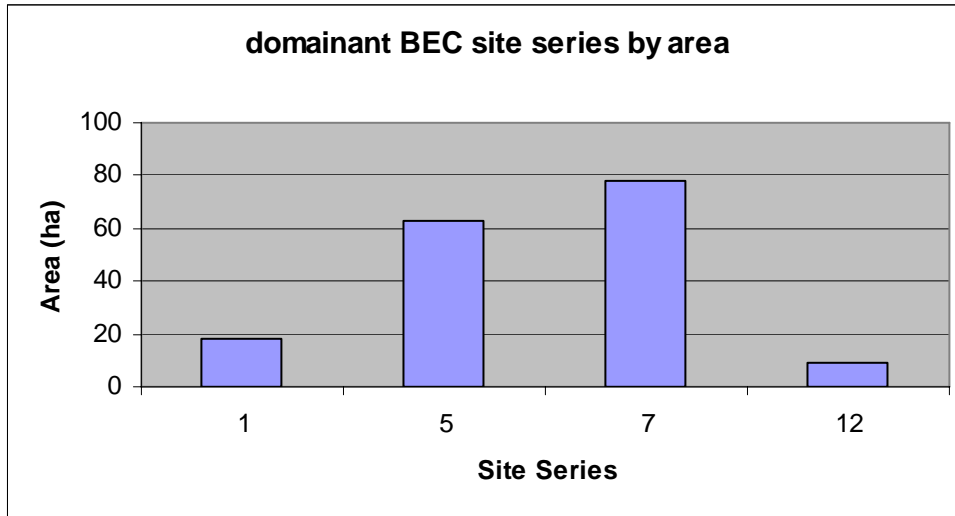


Figure 5 Summary of dominant site series

The following are general descriptions of the four primary site series and related plant species found in Green Timbers Urban Forest.

Site Series 01

Site series 01 includes sites with poor to medium available nutrients and slightly dry to fresh moisture levels (average for this subzone). In Green Timbers, this type of ecosystem is generally found where the terrain is slightly raised resulting in less accumulation of moisture and nutrients. It is often found as a complex with the nutrient rich, site series 05. The soils are generally loamy sands with 20-40 % coarse fragments. The humus form is generally classified as a mor.

The stands in this ecotype are dominated by Douglas-fir, western redcedar and western hemlock with minor components of red alder and paper birch. There are also some areas classified as site series 01 with planted Eastern White pine and Grand fir.

The understory is generally dominated by salal, red huckleberry, vine maple and bracken fern. Less abundant species included trailing blackberry, dull oregon grape, sword fern and spiny wood fern. A list of the major shrubs and herbs found in this ecotype are listed in Table 5.

Table 5 Dominant shrubs and herbs found in site series 01 ecotypes within Green Timbers Urban Forest

Shrub layer		Herb layer	
COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Vine Maple	<i>Acer circinatum</i>	Sword fern	<i>Polystichum munitum</i>
Salal	<i>Gaultheria shallon</i>	Spiny wood fern	<i>Dryopteris expansa</i>
Red huckleberry	<i>Vaccinium parvifolium</i>	Bracken fern	<i>Pteridium aquilinum</i>
Cascara	<i>Rhamnus purshiana</i>		
Dull Oregon Grape	<i>Mahonia-nervosa</i>		
False azalea	<i>Menziesia ferruginea</i>		
Trailing blackberry	<i>Rubus ursinus</i>		

Site Series 05

Site series 05 includes areas with rich to very rich available nutrients and slightly dry to fresh moisture levels (average for this subzone). The soils are generally sandy loams and loamy sands with 10-35 % coarse fragments. The humus form is generally a moder.

The stands in this ecotype are dominated by Douglas-fir, western redcedar and western hemlock with minor components of red alder, paper birch and bigleaf maple. There are also some areas classified as site series 05 with planted grand fir.

The dominant understory shrubs and herbs that distinguish this site series include an abundance of vine maple, salmonberry, trailing blackberry and sword fern. A list of the major shrubs and herbs found in this ecotype are listed in Table 6

Table 6 Dominant shrubs and herbs found in site series 05 ecotypes within Green Timbers Urban Forest

Shrub layer		Herb layer	
COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Vine Maple	<i>Acer circinatum</i>	Sword fern	<i>Polystichum munitum</i>
Salmonberry	<i>Rubus spectabilis</i>	Bracken	<i>Pteridium aquilinum</i>
Trailing blackberry	<i>Rubus ursinus</i>	Spiny wood fern	<i>Dryopteris expansa</i>
Red elderberry	<i>Sambucus racemosa</i>	Bleeding heart	<i>Dicentra formosa</i>
Thimbleberry	<i>Rubus parviflorus</i>		

Site Series 07

Site series 07 includes sites with rich to very rich available nutrients and moist to very moist moisture levels (greater than average for this subzone). This is the dominant site series found in the Forest due to flat slopes and poor drainage. This type of ecosystem is often found around streams and seepage draws. The soils are generally loamy sands or sandy loams with 20-40% coarse fragments. The humus form is generally a moder. Often these soils contain mottling and gleying, which are signs of a high and fluctuating water table.

The moisture levels on these sites are generally higher than is preferred by Douglas-fir trees, while western redcedar and many deciduous species are more naturally suited to these conditions. The majority of the stands in this ecotype are dominated by deciduous species including red alder and paper birch with components of cottonwood and big leaf maple. There are mixed coniferous stands that contain western redcedar, western hemlock and Douglas-fir growing on hummocks.

The understory is generally dominated by a dense layer of salmonberry, sword fern, lady fern and false lily of the valley. A list of the major shrubs and herbs found in this ecotype are listed in Table 7.

Table 7 Dominant shrubs and herbs found in site series 07 ecotypes within Green Timbers Urban Forest

Shrub layer		Herb layer	
COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Vine Maple	<i>Acer circinatum</i>	Sword fern	<i>Polystichum munitum</i>
Salmonberry	<i>Rubus spectabilis</i>	Lady fern	<i>Athyrium filix-femina</i>
Red elderberry	<i>Sambucus racemosa</i>	False lily-of-the-valley	<i>Maianthemum dilatatum</i>
Cascara	<i>Rhamnus purshiana</i>		
Trailing blackberry	<i>Rubus ursinus</i>		

Site Series 12

Site series 12 includes sites with medium to very rich available nutrients and wet moisture levels. The water table is often not farther than 30cm from the surface in these sites. In Green Timbers there are a number of large areas that do not drain quickly due to compacted layers near the surface and shallow slopes. These usually form complexes with the slightly drier, site series 07. The soils are either organic, due to poor decomposition of organic matter that builds up over time, or sandy loams with 0-40% coarse fragments. The humus forms are predominantly moders and mulls.

It is difficult for many trees to grow on these wet sites as the high water tables create anaerobic conditions. Usually deciduous species and western redcedar will establish on slightly drier microsites such as raised knolls. The understory is generally dominated by dense brush layer of salmonberry, elderberry and sword fern, lady fern and skunk cabbage. A list of the major shrubs and herbs found in this ecotype are listed in Table 8.

Table 8 Shrubs and herbs found in site series 12 ecotypes within Green Timbers Urban Forest

Shrub layer		Herb layer	
COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Vine Maple	<i>Acer circinatum</i>	Sword fern	<i>Polystichum munitum</i>
Salmonberry	<i>Rubus spectabilis</i>	Lady fern	<i>Athyrium filix-femina</i>
Red elderberry	<i>Sambucus racemosa</i>	False lily-of-the-valley	<i>Maianthemum dilatatum</i>
Devils club	<i>Oplopanax horridus</i>	Skunk cabbage	<i>Lysichitum americanum</i>

Non-native and heavily disturbed ecosystems

There are a number of heavily disturbed ecosystems in Green Timbers Urban Forest. These areas cannot be classified according to the BEC system as they contain non-native species and/or have been drastically altered by human activity.

Managed meadows

There is a large non-forested area (~8.5 ha) located between 100th and 96th Ave. to the east of the lake. This area was the proposed site of a stadium before it become part of the Urban Forest. It is currently being managed and maintained as a meadow plant community. Consequently, the natural plant succession has not been able to establish and develop. Perennial grasses and low-lying herbs and mosses dominate this area. There are scattered conifers and deciduous trees found in this area including a number of western redcedar that were planted by the Parks department. There are also a number of black cottonwood and red alder that annually germinate in these fields. These deciduous trees are cut each year by a tractor with chains to prevent their establishment.

A grassland meadows of this nature is not native to this maritime climate due to the high precipitation experienced on the coast. In B.C. grassland meadows are naturally found in the dry

and hot interior climates such as the South Okanagan. Although this meadow is not natural, it provides a unique habitat type for many small mammals and rodents and excellent hunting grounds for birds of prey. Additionally this area is the most popular and frequently visited area of the Forest and as such should continue to be managed as a meadow.

Polygon 13

This area is predominantly unforested with a number of non-native tree and brush species. It was likely used as a landing when this area was logged and therefore was heavily disturbed. There are currently dense brush fields of Himalayan blackberry (*Rubus discolor*) mixed with lesser amounts of salmonberry. Where there are no brush species it is dominated by various grass species and fire weed (*Epilobium angustifolium*). Other invasive species that have established here include scotch broom (*Cytisus scoparius*).

There are scattered tree specimens in this area many of which were planted. These include one black walnut (*Juglans nigra*), 4 cherry trees (*prunus sp.*) and 1 apple tree (*malus sp.*). Other more common native species include a mountain ash, western red cedar, black cottonwood, bigleaf maple and five red alder.

Efforts should be made to remove the non-native brush species from this site. Western red cedar and Douglas-fir should be planted in the open areas to help establish a native stand.

Polygon 15

This is a small unforested opening located at the north edge of the urban forest. It has a dense shrub layer consisting of salmonberry, vine maple, himalayan blackberry and elderberry. There are two large Douglas-fir growing on the north edge of the opening and one cherry tree. This area may have also been a landing for logging at one point that was heavily disturbed and has yet to seed in naturally.

The non-native species should be removed from this opening and if possible large stock of western red cedar planted to help establish a native stand.

Polygon 33 Planted Eastern White Pine forest

To the east of the lake area between 100th and 96th Ave. a 2-hectare grove of Eastern White Pine (*Pinus Strobus*) was planted by the B.C. Forest Service as an experimental trial in 1932. This species naturally grows in the Great Lakes-St. Laurence Forest Region. It produces the most valuable wood in eastern Canada, which is why it was likely experimented with here. This species is not well adapted to the climate of coastal BC and consequently this stand is unhealthy and its growth is stagnant. Increment cores taken in this stand show that the growth rates have been extremely slow over the past decade. These trees are generally tall and thin with little live crown. There is a significant fire hazard with this stand because of its high density, the number of dead standing trees within it, the flammability characteristics of this species and the accumulation of downed woody debris and needles on the ground.

Recommendations have been made in the Green Timbers Fire Management Plan to remove some of the fuel accumulations in this stand. It is recommended that in conjunction with this treatment a plan be established to restore a native plant community.

Wildlife

The Fraser Lowland portion of the coastal western hemlock zone is known to contain one of the greatest diversity of wildlife species found in BC. Green Timbers Urban Forest is located in this zone and supports a healthy population of small mammals, birds, amphibian and reptiles. This is largely due to the mild maritime climate and the presence of a variety of habitat types.

Mature Deciduous Forests

The wetter ecotypes found in the Forest are dominated by deciduous tree species and contain wetlands and some discontinuous ephemeral streams. The brush layer in these areas are very dense providing excellent ground cover and forage. Additionally, many of the deciduous trees are reaching a mature age and are beginning to decay and fall to the forest floor providing canopy gaps and increasing light to the understory vegetation. Because of the increase of coarse woody debris left on the forest floor and on dead standing trees there has been an increase in insect use in this area. These characteristics create excellent habitat for a variety of birds, small mammals rodents and amphibians.

Mature Coniferous Forests

The mature coniferous stands in the Forest, provide specific characteristics required by many animal species. The large limbs of the Douglas-fir provide nesting and roosting habitat required by many bird species including the bald eagle, great blue heron and a variety of owls and hawks. These large conifers and the scattered standing dead trees provide optimum habitat for cavity nesting birds such as woodpeckers. These cavities are subsequently used by secondary nesting birds such as owls and chickadees. There are a variety of smaller birds that breed and overwinter in these older forest types such as kinglets, juncos and migratory warblers and flycatchers. The huge cone productions of the Douglas-fir trees provide an excellent food source for many of these small mammals and bird species.

Squirrels thrive in these stands, taking advantage of the cavities produced by woodpeckers and the ample cone supply. A number of bat species nest behind the thick bark and cavities of the Douglas-fir including the blue listed Townsend's Big-eared Bat. The downed woody debris on the forest floor is critical for many terrestrial amphibians, reptiles and small mammals.

Grand fir Blowdown area

This is a unique area with regards to wildlife habitat. The planted grand fir in this stand are growing on a compacted soil layer that has resulted in shallow rooting systems for the trees. A series of windstorms has caused extensive blowdown over the past 10 years. This has resulted in an open stand with scattered standing live and dead trees, a dense understory and extensive large downed woody debris.

This has created excellent conditions for a variety of wildlife species. There are many dead trees left standing from the windstorms that are used by cavity nesting birds and mammals. The downed woody debris and dense brush layer provide excellent ground cover for a variety of small mammals and bird species. The open canopy and increased activity of small mammals provides excellent hunting for a variety of raptors.

The Meadow Area

One of the unique features of Green Timbers is the presence of the lake and adjacent meadow area. A meadow of this nature is not native to the maritime climate due to the high level of precipitation experienced on the coast. In B.C. grasslands are naturally found in the dry and hot climates in B.C. such as the South Okanagan. The majority of these native grasslands are heavily disturbed by human activity and many have been converted for crop cultivation. Consequently, many of the wildlife species associated with its ecology are endangered. Currently, about 25% of the red and blue listed wildlife species are associated with the meadows and grasslands of the Okanagan. Due to the maritime climate of this area and the frequent visitors

with dogs running off leash, many of the rare wildlife species often found in native grasslands have not established in Green Timbers.

The most important part of a meadow with respect to wildlife habitat is the type of vegetation and cover provided including grass height, density as well as the presence of shrubs and ground cover. These features provide excellent habitat for a variety of rodents, hares and insectivores as well as arthropods including grasshoppers, ants, beetles, bugs, butterfly and moth larvae, and spiders. These species in turn provide a steady food source for the diversity of predators including small mammals and raptors.

Many ground nesting birds such as the blue listed short eared owl and yellow listed northern harrier do not use this site because it experiences so much human and dog traffic. In order to provide adequate habitat for many native grassland bird species, a much larger area would have to be fenced off from the public. However, there are some ways to improve the wildlife habitat in this area without affecting the recreational opportunities. These include:

- Provide sparse conifer tree cover in the meadow. Scattered trees will provide roosting sites and cover for small mammals and birds. Douglas-fir are commonly associated with meadows in the interior. It is recommended that a few Douglas-fir trees be planted in the open meadow areas.
- Do not mechanically mow the meadow every year to remove new seedlings. Doing this prevents animals from nesting in the meadow. Trees that are unwanted in the meadow should be removed by hand or with a brush saw.
- Provide a diversity of ground cover for small mammals. An easy way to accomplish this is to disperse Douglas-fir logs of various decay classes across the meadow area.

Wetlands

There are a number of areas within the forest that can be classified as wetlands. These ecosystems perform important hydrological and ecological functions and are essential components of the landscape level biodiversity. A wetland is defined as an area where the water table sits at about the surface for a long enough time that low soil oxygen levels and is the predominant factor in soil and vegetation community development. These plant communities contain an abundance of hydrophytes (plants which adapted to grow in waterlogged soils) and soils exhibit "hydric" characteristics (contain deep peat horizons and/or are gleyed and mottled.)

Wetlands are transitional between open water and terrestrial ecosystems and form critical wildlife and fish habitat for a variety of plant and animal species. Additionally, their soils and vegetation act as important natural biochemical filtration systems. In the lower mainland, these ecosystems are becoming increasingly rare as they occur predominantly in the valley bottoms and lowlands where urban development is concentrated.

There are five general wetland classes including Bogs, Fens, Marshes, Swamps, and Shallow Open Water. In Green Timbers, the existing wetland ecosystems are concentrated around the edges of the Lake and associated creek to the north. These wetlands can be classified as predominantly marshes. Other small patches of wetlands can be found within the treed ecosystems that are classified as site series 12. These wetlands are classified predominantly as bogs.

Wetlands are critical elements of a healthy forest ecosystem that provide unique habitat features. Due to their rarity, preservation of these wetlands is critical for maintaining biodiversity and adequate wildlife habitat on a landscape level. For these reasons, the protection of the existing wetlands found within Green Timbers should be made a priority.

Wildlife Habitat Fragmentation

The Forest is highly fragmented by three major roadways including Fraser Highway, 100th Ave, 96th Ave and 144th St. This is creating a number of separate habitat islands which is

preventing the free movement of wildlife. Additionally many animals are killed by vehicle traffic when crossing these roadways. There are currently proposals to widen both the Fraser Highway and 100th Ave or 96th Ave. Additionally, traffic loads in the Greater Vancouver Regional District are predicted to rise dramatically in the next two decades.

Keystone Wildlife Research Ltd. produced a report investigating road mitigation and construction techniques that would reduce and/or mitigate impacts of existing roads as well as future road widening on the Forest. Recommendations were made to rehabilitate 144th St and create wildlife crossings of Fraser Highway. Both of these proposals would greatly enhance the wildlife values in this area.

Mammals

Many of the larger mammals native to this region and to originally inhabit these forests have long been driven away from urban development including the cougar, grizzly and black bear, black tailed deer and gray wolf. A number of animal species were listed in the document Surrey's Green Timbers – a proposal to preserve (1973). The largest species that was present in 1973 was the black tailed deer. No sign of this species have been found in the forest recently. This is likely due to the extensive development adjacent to the Forest and its fragmentation by roads.

Some of the larger mammals currently inhabiting the forest include:

- Coyote (*Canis Latrans*)
- Short-tailed weasel (*Mustela erminea*)
- Long-tailed weasel (*Mustela frenata*)
- Western spotted skunk (*Spilogale gracilis*)
- Striped skunk (*Mephitis mephitis*)
- Mink (*Mustela vison*)
- Common racoon (*Procyon lotor*)
- Virginia Opossum (*Didelphis virginiana*)

The presence of many of these carnivores is due to the presence of the lake and streams as well as the abundance of food including small rodents and hares found in the Forest and meadow area. These rodents and insectivores include:

- Porcupine (*Erethizontidae*)
- Mouse family (*Muridae*) including a variety of mice rats and voles
- Jumping Mouse family (*Zapodidae*)
- Squirrel family (*Sciuridae*) including chipmunks and the ground and flying squirrels
- Mole family (*Talpidae*) including the coast mole
- Shrew family (*Soricidae*)

The meadow area and adjacent forest support a healthy population of hares (*Leporidae*). These include:

- Eastern Cottontail (*Sylvilagus floridanus*) A non-native species originally introduced to Washington
- Snowshoe Hare (*Lepus americanus*)

Additionally there are a number of bats that have been identified in the Forest including:

- Big Brown bat (*Eptesicus fuscus*)
- Townsend's Big-eared bat (*Plecotus townsendii*)
- Little brown myotis (*Myotis lucifugus*)

Birds

There are a variety of bird species that inhabit Green Timbers. This is largely due to the diversity of habitat types and food sources that are present. There is a range of forest types containing both coniferous and deciduous species and ranging from young dense stands to

mature forests and open blowdown areas. Ground cover ranges from open, low density, shrub cover to very dense and high brushy areas in the wetter and open ecosystems. The meadows and lake area also provide a unique bird habitat for many resident and migratory species. These populations are also supported by the presence of other birds and rodents, bark and wood-boring insects, and conifer seeds. The complete list of species found in the Forest is extensive. Some of the most notable species include:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Great Blue Heron (*Ardea herodias*)
- Great Horned Owl (*Bubo virginianus*)
- Saw-whet Owl (*Aegolius acadicus*)
- Pileated Woodpecker (*Dryocopus pileatus*)
- Hairy Woodpecker (*Picoides villosus*)
- Hammond's Flycatcher (*Empidonax hammondi*)
- Steller's Jay (*Cyanocitta stelleri*)
- Chestnut-backed Chickadee (*Parus rufescens*)
- Red-breasted Nuthatch (*Sitta canadensis*)
- Winter Wren (*Troglodytes troglodytes*)
- Varied Thrush (*Ixoreus naevius*)
- Red-tailed Hawk (*Buteo jamaicensis*)
- Townsend's Warbler (*Dendroica townsendi*)
- Common Nighthawk (*Chordeiles minor*)

The Great blue heron, a vulnerable species within BC, likely use the large trees (Douglas fir, red alder, western redcedar, and black cottonwood) in this forest for nesting due to its proximity to the Fraser River. Additionally bald eagles and a number of raptors have been seen hunting in the forest. One large raptor nest in particular was found in the deciduous stand at the south west end of the forest. The meadows and open blowdown areas provide excellent hunting grounds for raptors.

Amphibians and Reptiles

The high precipitation in this area along with the slow infiltration rate of the soil have created many areas with high moisture levels. The damp litter floor found under the mature stands as well as the presence of wetlands, riparian areas, the lake and meadows provides a variety of habitat for a number of amphibian and reptile species. These include but are not limited to:

- Northwestern Salamander (*Ambystoma gracile*)
- Western Red-backed Salamander (*Plethodon vehiculum*)
- Western Redback Salamanders (*Plethodon vehiculum*)
- Western toad (*Bufo boreas*)
- Red-legged Frog (*Rana aurora*) (blue listed)
- Pacific Tree frog (*Hyla regilla*)
- Painted Turtle (*Chrysemys picta*) (blue listed)
- Western Terrestrial Garter Snake (*Thamnophis elegans*)
- Common Garter Snake (*Thamnophis sirtalis*)

Ecological Biodiversity

It is difficult to determine the level of biological diversity in a stand as the term implies a general measure of the number of species supported by an ecosystem. The greatest degree of biological diversity is usually found in the earliest and latest stages of stand development. Young shrub communities contain a diverse composition of herbs and shrubs that form a complex structural habitat and abundant food sources for many species. As the forest ages into a young stand, the tree canopy closes and the understory is shaded out, causing the structural and species diversity to decline. After about 80 years in this type of ecosystem, the biodiversity level increases again as the trees reach a larger size, scattered wildlife trees are created and gaps form in the canopy admitting light to the forest floor.

Green Timbers Urban Forest generally contains mature forest types. Most of the Forest consists of closed even aged stands between 60 and 80 years old. Shrub communities are developing in the extensive blowdown areas and in the open deciduous stands. Additionally there are young deciduous forests adjacent to the meadow. All of these stand types contain different features that provide specific habitat for a variety of species. None of these stands have reached an age that can be classified as old forest. However, some of the mature conifers stands are reaching an age and structure where they will soon exhibit features of old growth forests such as multiple canopy layers, canopy gaps, large trees with large limbs and numerous standing dead trees.

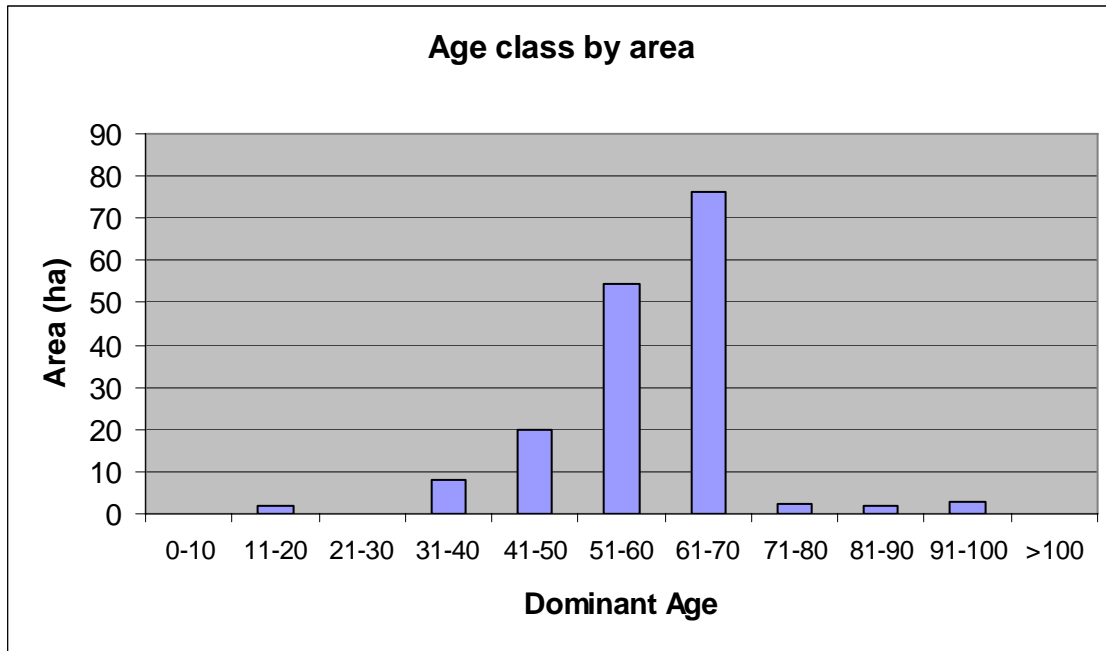


Figure 6 The age class distribution of stand types found in the forest.

Rare and Endangered Plant Communities, Plants and Animals

It is widely agreed that the protection of rare and endangered ecosystems is critical for conserving both genetic and species diversity in B.C. All rare ecosystems need some type of conservation not only to ensure the natural state of these plant communities but also to provide habitat for the rare plant and animal species that rely on them.

The British Columbia Conservation Data Centre (CDC) is a part of the Wildlife Inventory Section of the Resources Inventory Branch of B.C. This organization is responsible for collecting and storing information on rare and endangered plants, animals and plant communities in B.C. All of these entities have been ranked by the CDC as either red, blue or yellow-listed. Red-listed entities are considered extirpated, endangered, or threatened in British Columbia. Blue-listed entities are considered vulnerable and are sensitive to human activity or natural events. Yellow-listed entities are not at risk but are considered vulnerable during times of seasonal concentration (CDC, 2001). The rare and endangered species and plant communities identified by the CDC have been compared to those that exist in Green Timbers Urban Forest in order to determine their rarity.

Rare Animal Species

Many rare animal species rely on the habitat features found only in older forests. Although many rare and endangered animal and plant species have not been confirmed in Green Timbers Urban Forest, it is important to note that these forests will continue to provide the type of habitat that they require. As this forest ages, the trees will get larger, there will be more wildlife trees created and the structural complexity of the stands will increase. Additionally, they will provide a constant supply of coarse woody debris that will eventually provide suitable habitat for a number of rare and endangered amphibians and reptiles.

Two of the sensitive bird species that likely use the large Douglas-fir and Black cottonwood trees in Green Timbers for habitat include the great blue heron (*Ardea herodias*), a blue-listed species, and the bald eagle (*Haliaeetus leucocephalus*), a yellow-listed species. These large birds rely on the large strong branches in these trees for nesting and perching.

Table 9 The following rare and endangered wildlife species have been confirmed within Green Timbers Urban Forest

Common Name	Scientific Name	B.C. Status
Long-tailed weasel	<i>Mustela frenata altifrontalis</i>	Red
Southern Red-backed Vole	<i>Clethrionomys gapperi occidentalis</i>	Red
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Blue
Green Heron	<i>Butorides virescens</i>	Blue
Red-legged Frog	<i>Rana aurora</i>	Blue
Painted Turtle	<i>Chrysemys picta</i>	Blue
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Yellow

Green Timbers Urban Forest contains the proper habitat characteristics to support a number of rare and endangered wildlife species that have not yet been confirmed. Some of these are listed in Table 10

Table 10 Rare and endangered species which could potentially inhabit Green timbers but have not been confirmed.

Common Name	Scientific Name	B.C. Status
Keen's Long-eared Myotis	<i>Myotis keenii</i>	Red
Pacific Water Shrew	<i>Sorex bendirii</i>	Red
Trowbridge's Shrew	<i>Sorex trowbridgii</i>	Blue
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Red

Rare Plant Species

There are currently no red (endangered) or blue (vulnerable) listed species that have been confirmed within the Forest. It is important to note that many of the red and blue listed plant species grow in wetlands or in ecosystem types with high moisture levels. Therefore Green Timbers provides much of the habitat required by these species. There are a number of yellow listed species of interest that are listed in Table 11.

Table 11 Yellow listed plant species of interest that inhabit Green Timbers

Common Name	Scientific Name	B.C. Status
western trillium	<i>Trillium ovatum</i> var. <i>ovatum</i>	Yellow
pacific western yew	<i>Taxus brevifolia</i>	Yellow
miner's-lettuce	<i>Claytonia perfoliata</i>	Yellow
western flowering dogwood	<i>Cornus nuttallii</i>	Yellow
A number of orchids	<i>Orchidaceae</i>	Yellow

Rare Plant Communities

Plant communities are defined as units of vegetation with a relatively uniform plant species composition and physical structure. The CDC classifies rare and endangered plant communities according to the age of the ecosystem and how it is classified according to the biogeoclimatic classification system. Generally, young plant communities tend to be more common and therefore are not considered as rare as older plant communities that are undisturbed by human activity. These older ecosystems are considered more diverse and provide a stable habitat for a range of plants and animals.

Most of the plant communities which are considered rare and endangered by the CDC are old growth forests (>250 years old). None of the forest in Green Timbers are old enough to be classified as old growth and therefore do not match most of those identified as rare by the CDC. However, it is important to recognize that some older stands already express, and will continue to develop, some of the characteristics unique to these endangered stands. The stands which contain the ecological characteristics and tree species which will eventually develop in to one of the rare and endangered plant communities identified by the CDC are listed in Table 12 and shown in Figure 7.

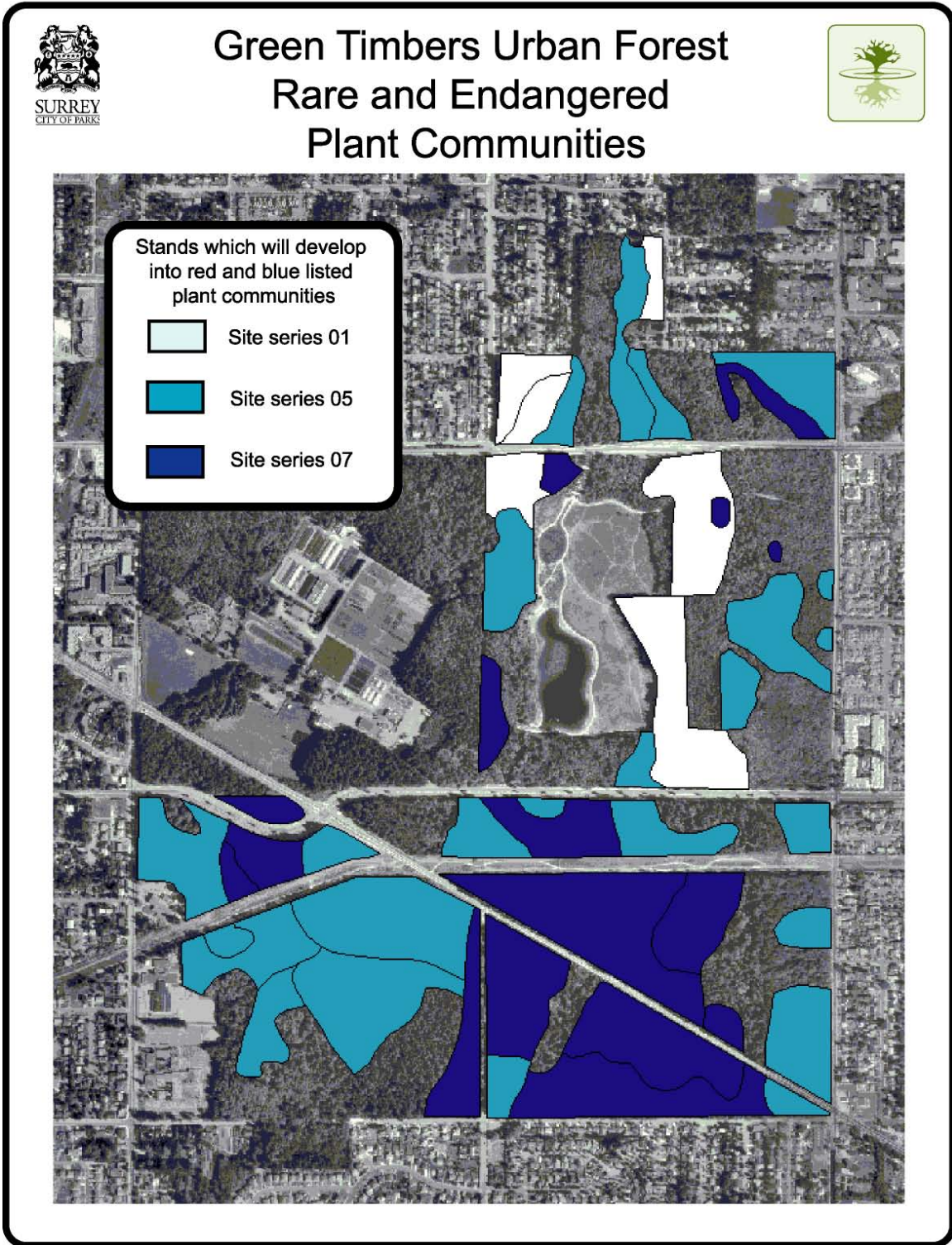


Figure 7 Future red listed (rare and endangered) and blue listed (at risk or vulnerable) ecosystems according to the Ministry of Sustainable Resource Management Conservation Data Centre (CDC).

Table 12 Future rare plant communities in Green Timbers Urban Forest according to the CDC.

ID #	Scientific name	Common name	Biogeoclimatic Ecosystem Classification Unit ¹	Provincial Ranking ³	Structural Stage ²
1	<i>Thuja plicata</i> / <i>Tiarella trifoliata</i> Dry Maritime	Western redcedar /three-leaved foamflower Dry Maritime	CWHdm/07	Blue	7
2	<i>Thuja plicata</i> / <i>Polystichum munitum</i> Dry Maritime	Western redcedar /swordfern Dry Maritime	CWHdm/05	Blue	7
3	<i>Tsuga heterophylla</i> / <i>Plagiothecium undulatum</i>	Western hemlock /flat moss	CWHdm/01	Red	7

¹ See Green and Klinka (1994)

² 7 indicates old growth forests (

³ Red listed (rare and endangered) and blue listed (at risk or vulnerable) ecosystems

Plant Community #1 – Site Series 07 - Western redcedar/three-leaved foamflower dry Maritime

Plant community #1 is an old growth forest stand growing on moist to very moist sites with rich to very rich nutrients (site series 07). These stands are considered blue listed and are currently declining rapidly due to primarily forest harvesting. The primary trees species found in these stands are western redcedar, and western hemlock with minor components of Douglas-fir and red alder.

In Green Timbers there are currently about 41ha of forested stands that will likely develop into this plant community. These are located primarily south of 96th Ave.

Plant Community #2 – Site Series 05 - Western redcedar/swordfern, dry maritime

Plant community #2 is an old growth forest stand growing on slightly dry to fresh sites with rich to very rich nutrients (site series 05). These stands are considered blue listed and are currently declining due to primarily forest harvesting. The primary tree species found in these stands are western redcedar, western hemlock and Douglas-fir with a minor component of red alder.

In Green Timbers there are currently about 52ha of forested stands that will likely develop into this plant community. These are scattered through out the Forest.

Plant Community #3 – Site Series 01 - Western hemlock /flat moss

Plant community #3 is an old growth forest stand growing on slightly dry to fresh sites with very poor to medium nutrients (site series 01). These stands are considered red listed and are currently declining rapidly due to primarily forest harvesting. The primary tree species found in these stands are western hemlock and Douglas-fir with a minor component of western redcedar.

In Green Timbers there are currently about 16ha of forested stands that will likely develop into this plant community. These are located to the north of 96th Ave.

Forest Resources and Facilities

Trail System

There are two types of trails in Green Timbers Urban Forest. There are authorized trails, sanctioned by the City of Surrey as part of the official trail network and, as such, are maintained by the City. The second are unauthorized trails not sanctioned by the City of Surrey, created naturally by continual public use. Currently there are 14.6km of authorized trails and 9.6km of unauthorized trails. The authorized trails are categorized by their levels of maintenance and standards as summarized in Table 13 and Appendix B.

It is important to note that there are two paved trails adjacent to the Forest. The first is a long trail travelling in an east-west direction just south of 96th Avenue, along the powerlines and is maintained by BC Hydro. It has been included in this report because it plays an important role as a recreation and transportation corridor within the confines of the Forest. The second paved trail extends along the north side of 100th Ave. between 144th St. and 148th St. This paved trail is maintained by the City of Surrey.

Table 13 Current trail classifications and lengths in Green Timbers Urban Forest (Descriptions of trail classifications can be found in Appendix B)

Trail Classification	Length (m)
BC Hydro paved pathway	2,099*
Paved pathway along 100 th Ave.	789
Nature	7,066
Pathway	3,268
Recreational Nature	1,416
Unsanctioned	9,575
Total	24,213

*Length of trail within the Forest boundary

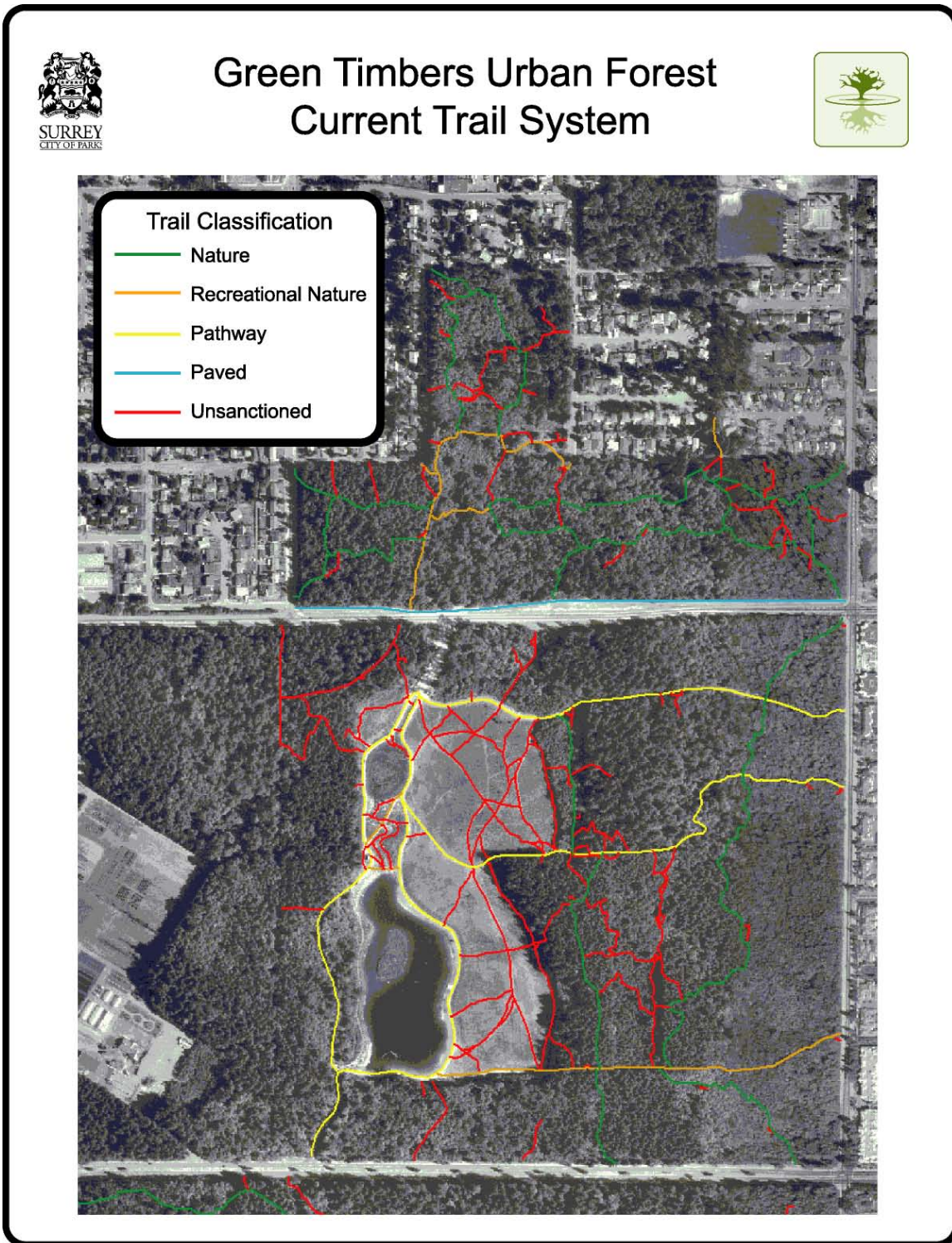


Figure 8 Current trail system in the north end of Green Timbers Urban Forest

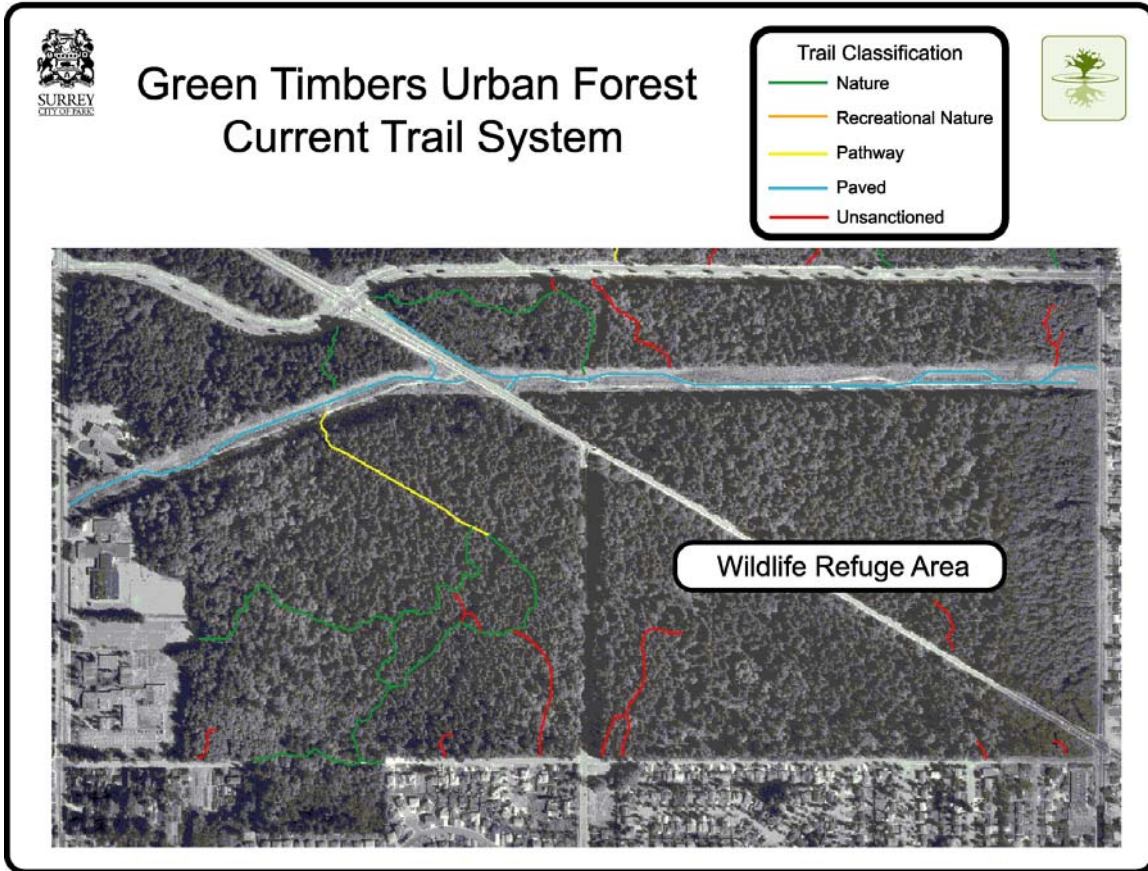


Figure 9 Current trail system in the south end of Green Timbers Urban Forest

Trail System Design

There is approximately 12.5 kilometers of authorized trails within the Forest excluding the paved trail along the BC Hydro right of way. Of these trails, 56% (7km) are classified as nature trails, 11% (1.4km) are classified as recreational nature trails and 26% (3.3km) are classified as pathways. The paved pathway along the north side of 100th Ave is 0.8km long.

Table 14 Specific standards for trail classifications found in Green Timbers Urban Forest

	NATURE TRAIL	RECREATIONAL NATURE TRAIL	PATHWAY
PURPOSE	Urban hiking, solitude, nature interpretation	Exploration, discovery and recreation based foot traffic and slow off-road bicycling.	Designed to bear weight of larger vehicles for service or emergency access to a site. Other uses are accommodated.
INTENDED USAGE RATE	Low Single track	Low-Medium Double or Single Track	Low-High (location dependant)
TREAD WIDTH	0.5m.-1.0m.	1.0m.-1.5m.	2.5m-4.0m.
SURFACE TYPE	Crushed rock, Wood shreds, bark mulch, native mineral soils, log corduroy.	Crushed rock, Wood shreds, bark mulch, native mineral soils.	Compacted crushed rock, soil cement, asphalt, concrete
OVERHEAD VEGETATION CLEARANCE	Obstructions only to 2.4m. above tread surface	2.5m. above tread surface.	3.0m. above tread surface
COMMENTS	Maintain to avoid wet spots and vegetation encroachment	Utilize in more sensitive natural sites. Medium maintenance standards.	Use only when service / emergency access to a given area is absolutely necessary

*Complete standards can be found in Appendix B

The majority of the authorized trail system is located north of 96th Avenue and currently provides adequate access to the most popular areas of the Forest. Subsequently this is also where the majority of the unauthorized trails can be found. There are fewer authorized and unauthorized trails south of 96th Ave. This area experiences substantially less traffic and contains a large area to be designated as an environmental protection/wildlife refuge zone.

There are a few deficiencies in the current trail plan. Many of the authorized trails are not classified accurately according to their level of use and their standards of maintenance. Additionally, many of the unauthorized trails are not necessary and/or are running through sensitive ecosystems. Others are frequently used because they provide necessary access and nature experiences lacking in the current trail system. Recommendations have been made for the management of a new trail system that makes changes that includes changes to their classification, location and/or maintenance standards.

The Forest has been separated into three distinct areas. Recommendations for trail design and management are described below and illustrated in Figures 10 and 11.

North of 100th Ave.

Most of the trails north of 100th Ave are currently classified as nature trails with the exception of the Salmonberry trail, which is a recreation nature trail. The paved pathway that runs along the north side of 100th Ave is maintained by the Parks Department and is a part of the proposed Greenways Plan. There are also many small unauthorized trails in this area.

It is recommended that the southern half of the Trillium Loop trail and the trails connecting the north end of the Salmonberry trail to 100th Ave. be upgraded to recreation nature trails to accommodate the high traffic flow (Figure10). This will provide adequate access on well maintained trails throughout this portion of the Forest. The boardwalks above the wetlands in this area should be well maintained to protect these unique and sensitive ecosystem types.

Several of the small-unauthorized trails in this area provide important access to the trail system and should be authorized as nature trails. These include a small trail connecting Yew trail, north to 101 Ave. and three spur trails providing access to Yellow Arum trail from 145th St and 146th St. (Figure 10) The remaining unauthorized trails in this area should be decommissioned.

People and their dogs going off the trails coupled with a lack of light coming through the trees has resulted in little understory vegetation in the western portion of Moss trail. Consequently, it is unclear where the authorized trails are located. These trails should be lightly graveled or have chips placed on them so that they are easy to follow. Signs should be placed here to stay on the trails and native species should be planted to try to encourage re-growth in this area.

South of 100th Ave and North of 96th Ave.

The most heavily used trails in the forest are those located between 96th and 100th Avenues. The main trails in this area are classified as pathways with the exception of the Cedar trail, which is classified as a recreation nature trail. The remaining authorized trails that run in a north-south direction are classified as nature trails. It is recommended that the Cedar trail be reclassified and maintained as a pathway similar to the other primary trails and that the currently classified nature trails be upgraded to recreation nature trails to accommodate the high traffic flow in this portion of the Forest.

There is an extensive network of currently unauthorized trails in this area. Many of these trails are used heavily and provide access and/or nature experiences not provided for by the authorized trails. One trail runs along the east side of the Eastern White pine plantation and connects the Pine trail with the Salal trail. Another runs west from this trail through the Eastern White pine stand to connect with the Hemlock trail. A third trail extends west to connect the Hemlock trail with the meadow area. These trails are used extensively and provide important

access. Therefore, it is recommended that they be authorized and classified as nature trails (Figure 10).

Just to the west of the parking lot off 100th Ave. there are no authorized trails. In this area there is an old roadbed running south west from 100th Ave. There are then two small- unauthorized trails connecting this trail to the Birch trail. There are no other trails accessing this portion of the forest and adding this trail to the design forms a logical loop. Authorizing these trails, as nature trails, offers visitors another opportunity for a varied surface and access to 100th Ave. without having to go through the parking lot.

There are extensive, small braided trails running through the meadow area to the east of the lake. This is the most popular portion of the Forest and it would be very difficult to close all of these trails. The main trails running through this area should be authorized as shown in Figure 10. These trails will also serve as important fire breaks for any meadow fires that may start in this area.

South of 96th Ave.

This portion of the Forest experiences the least traffic flow. The forested area located to the east of 144 St. is a proposed environmental protection/wildlife refuge zone. It is a priority to permanently close all trails in this area. The trails located to the west of 144th St. are all classified as nature trails except for the Railbed trail, which is currently classified as a pathway. The classifications of the trails in this area do not warrant upgrading, as the traffic flow is relatively low. The exception is a well-used trail located between the BC Hydro right of way and 96th Ave. along the west side of King Creek. This trail is a part of the proposed Greenways plan that links up with Willow trail to the north of 96th Ave. For this reason, it is recommended that this trail be upgraded to a pathway.

This area is not used frequently because the trail system provides limited access and does not form a continuous loop. In order to encourage use in this area it is recommended that a trail be built from the Maple trail north to the BC Hydro right of way. Additionally, a nature trail could be built from the east end of King Creek trail to access 144th St. (Figure 11).

The remaining unauthorized trails in this area should be closed as per the guidelines outlined in the following section of this plan. Priority should be given to all unauthorized trails located to the east of 144th St. in the proposed wildlife refuge area. Additionally, there is an unauthorized trail running north from 92nd Ave to the King Creek Trail through the current blow down area. This trail should be a priority for closure due to safety concerns. The spur trail that crosses King Creek between the King Creek Trail and the Sword Fern Trail should also be closed and rehabilitated as it has damaged the riparian area and is causing sedimentation into the creek.

There is a well-established nature trail running along the southern boundary of the Forest connecting to 92nd Ave. There is currently no proper crossing of King Creek along this trail. This is causing extensive degradation and erosion into the creek. It is recommended that a small footbridge is constructed here and the riparian areas are rehabilitated.

One of the main reasons this portion of the Forest receives fewer visitors is that it is isolated from the rest of the Forest by 96th Ave. and Fraser Highway. Due to this fragmentation of the Forest by roads, recommendations have been made to decommission 144th St. south of the Fraser Hwy to 92nd Ave. By doing so, it allows a larger, continuous natural area. When this road is decommissioned, it is recommended that a trail be constructed that meanders along what is now 144 St., across Fraser Hwy and to the base of the East Cascara trail. This trail should be classified as a recreation nature trail and a pedestrian/wildlife overpass or underpass should be built where this trail meets the Fraser Hwy to ensure safe crossings to the rest of the Forest. If the Greenways plan follows its proposed route, a safe crossing would have to be built across 96th Ave. as well. These crossings would greatly improve access to this southern portion of the Forest.

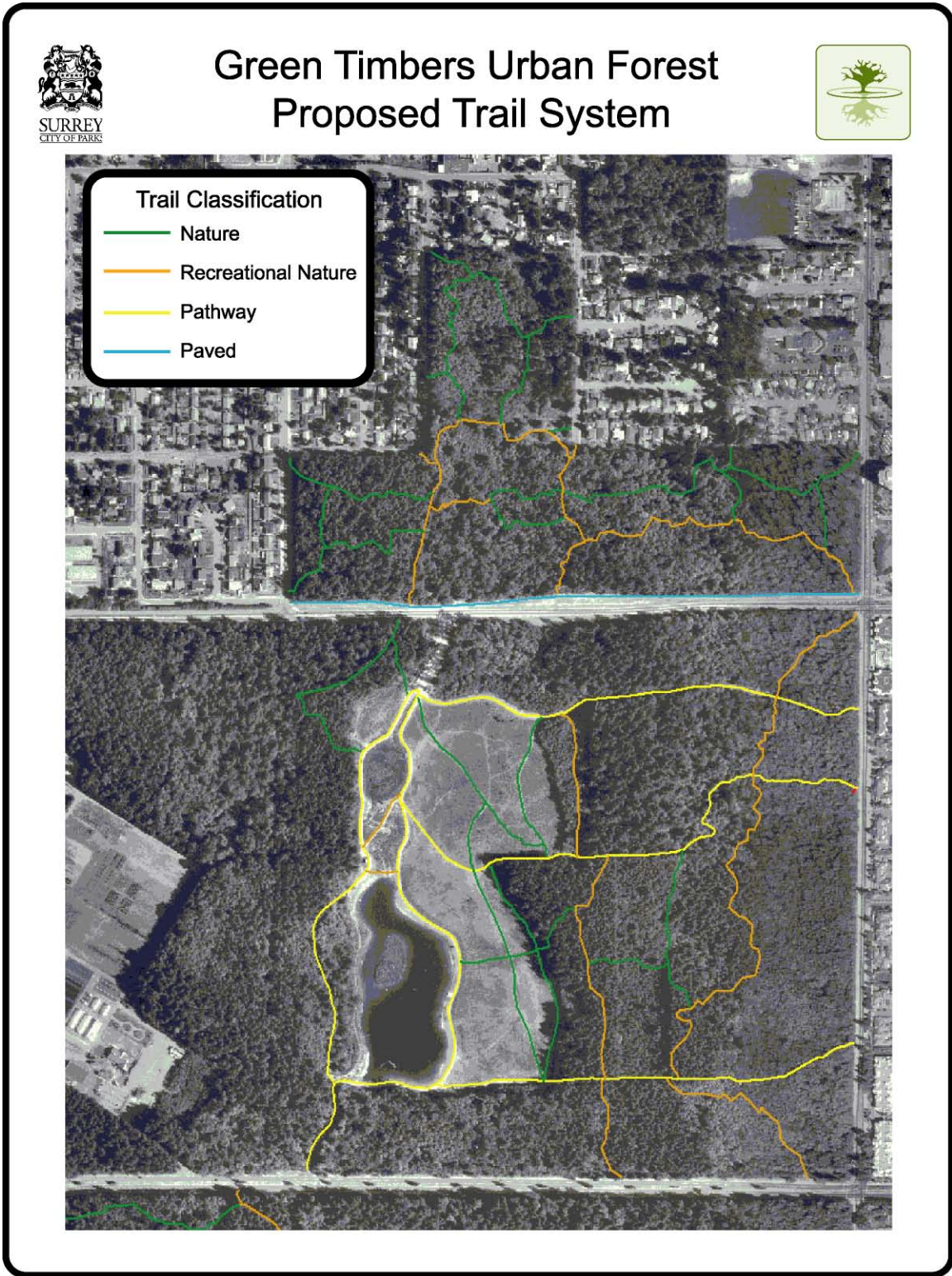


Figure 10 Proposed trail system for the north end of Green Timbers Urban Forest

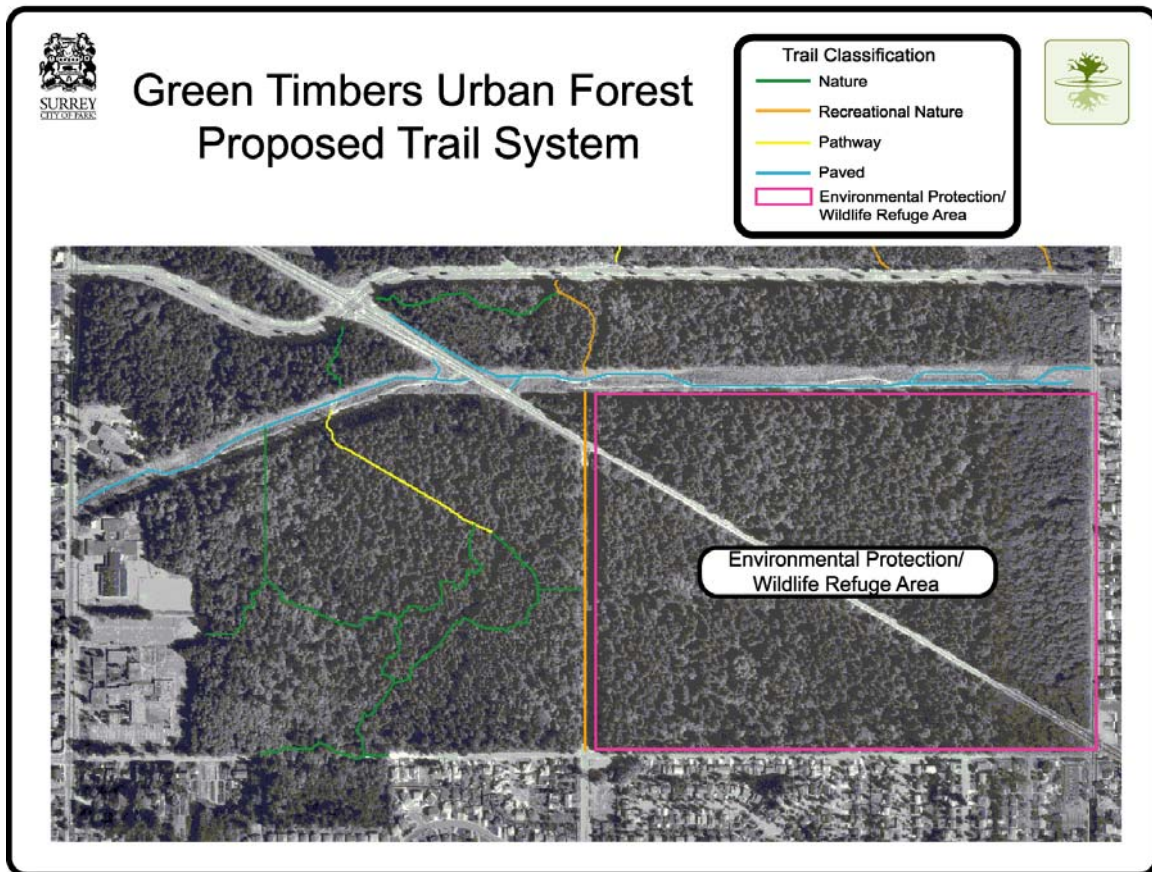


Figure 11 Proposed trail system for the south end of Green Timbers Urban Forest

City of Surrey Greenways Plan

Green Timbers Urban Forest forms an important component of the City's proposed Greenways plan (Figure 12). The proposed Greenways route travels along the length of the BC Hydro right of way. A branch runs north from this trail along the Cascara Trail East across 96th Ave and follows the Willow trail north to 100th Ave. The original proposed Greenways plan (as shown in figure 12) looped through the Forest north of 100th St.. Following consultation with the City of Surrey planning department it has been decided that this trail should be changed to run west along the paved pathway on the north side of 100th Ave. There are also plans to widen 100th Ave. to four lanes and to put a pedestrian overpass across the road.

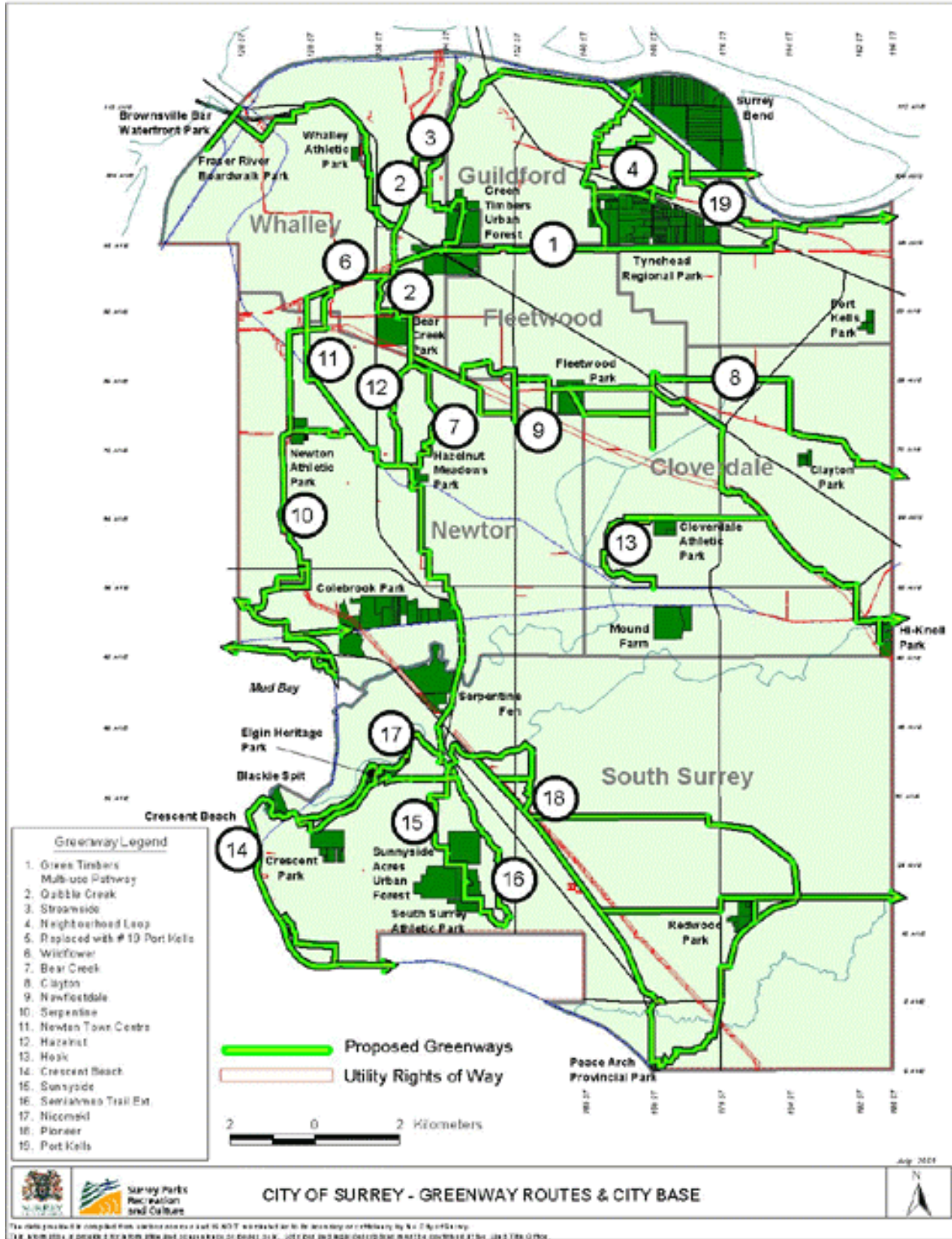


Figure 12 Proposed Greenways plan for the City of Surrey

Naming of the authorized Trails

Currently there are only names for some of the main trails in the Forest. Most of the named trails follow the theme of trees and plants found in the Forest with the exception of the King Creek and Railbed Trails. The remaining trails have been named following this theme of native trees, plants or historical references. All of the small access trails should be named the same as the trails they are accessing. The current and proposed trail names have been illustrated in Figures 13 and 14.

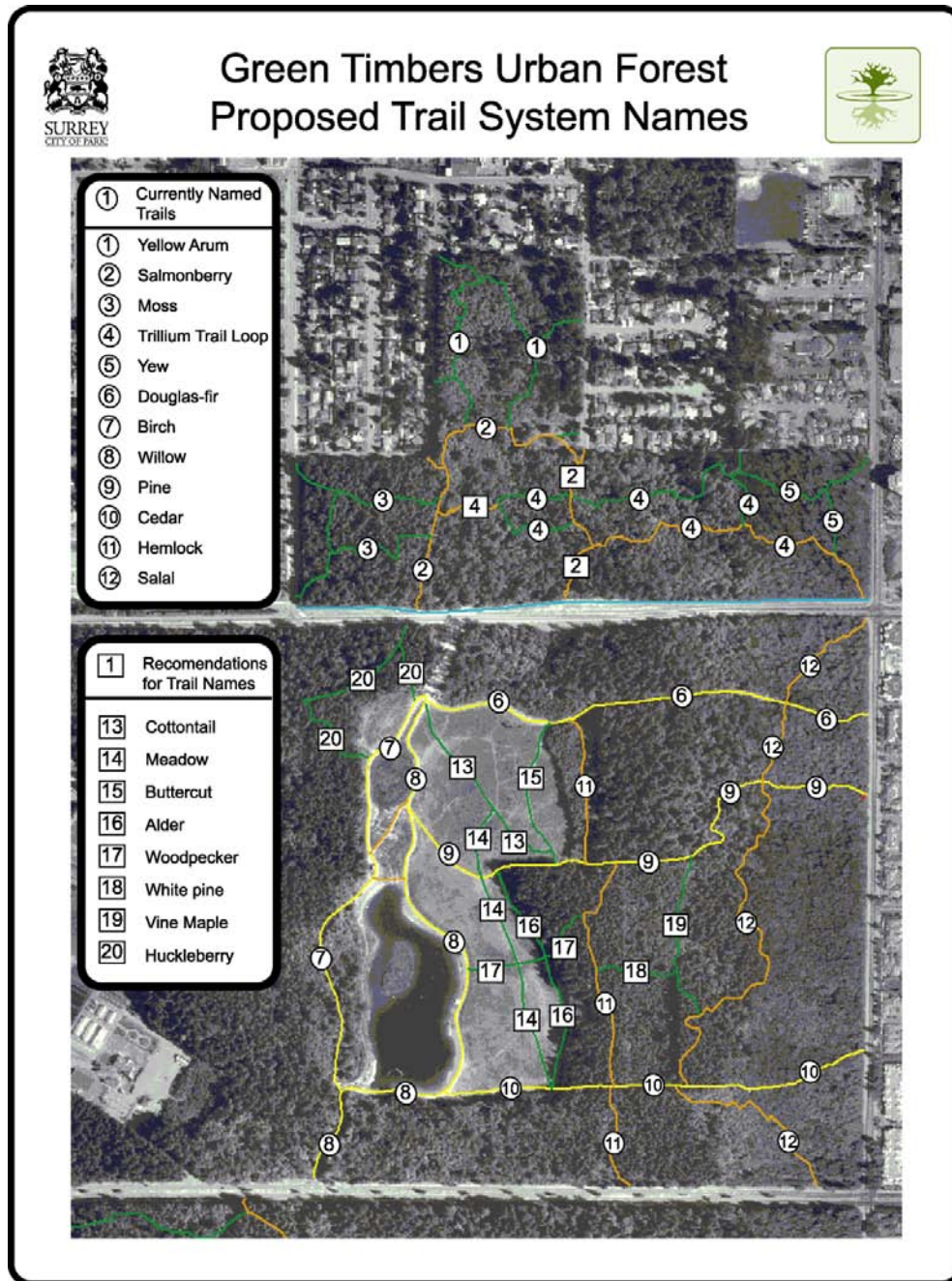


Figure 13 Proposed trail names, north end

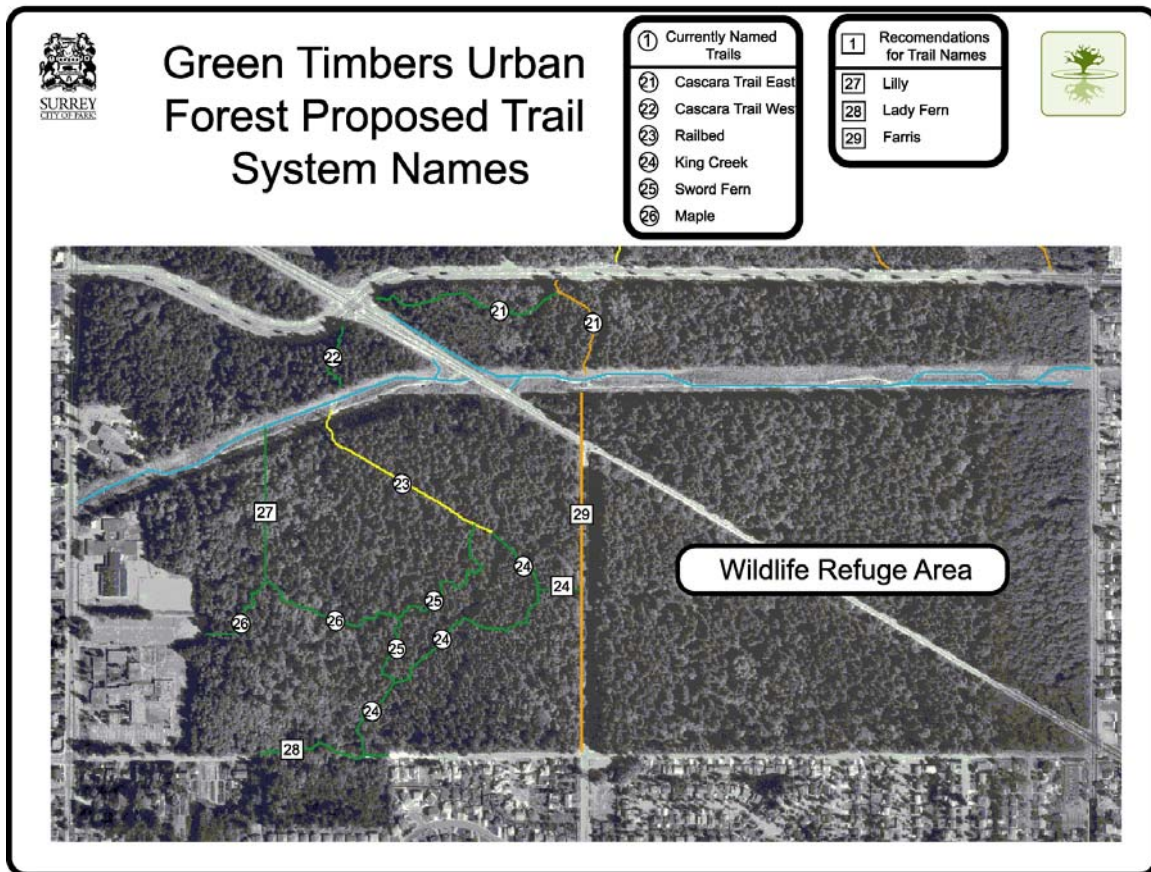


Figure 14 Proposed trail names, south end

Unauthorized Trails

There are approximately 9.6km of trails currently considered unauthorized that have been identified in the Forest. These trails vary in their degree of traffic use and condition. They are not maintained by the City and as such can only be classified as nature trails, according to NAARMS.

There are a number of reasons why these trails exist. Primarily, these trails lead to areas of the Forest not currently accessed by the sanctioned trail system maintained by the Parks Division. As they are not maintained, they are generally not as wide and provide more diverse and complex surfaces for recreation. Many people prefer to travel on these trails to gain a more intimate experience with the natural environment. Additionally, these trails are more difficult to locate, as they are often barely visible from where they branch off from the authorized trail network. Travel on these unauthorized trails is difficult in places because of the uneven grades and woody debris on the ground and therefore, these trails experience less traffic. For this reason many users prefer them in order to avoid the traffic experienced by the maintained trails. In many cases, these unauthorized trails provide important access that is not being provided for by the existing trail network.

The concern is that by not closing down these trails, there is a greater chance that users will continue to go further into undeveloped areas to establish additional trails. This process can eventually lead to extensive networks of trails that become extremely difficult to identify and decommission. For this reason, it is important to produce an annual inventory of all unauthorized trails and a prioritized plan for decommissioning them.

It has been recommended in the previous section that many of these trails be classified and managed as authorized trails. These trails are frequently used and add to the current trail system by providing access to remote areas of the park or connect the trail system to logical entrance routes. The remaining unauthorized trails are prioritized for rehabilitation based on safety and ecological sensitivity of the Forest.

Closing Unauthorized Trails

There are a number of techniques of varying intensity that can be used to permanently close and rehabilitate unauthorized trails. The success and extent to which these techniques will have to be implemented by Parks Division staff is dependent on the level of traffic and establishment of the trail. The following process used to close trails incorporates many of the ideas outlined by the *Natural Areas Access and Recreation Management Strategy* (2000) NAARMS. These recommendations are in listed order of increasing intensity.

1. Remove any identified tree hazards and utilize the debris to physically block access to the trail. Limited amounts of small debris can be laid flat so that it does not create a fire hazard. Place large rocks in front if they are readily available.
2. Place natural debris (wood and shrubs) along the entrance of the trail to hide it and discourage users. The use of clipped blackberry bushes, which are common around the perimeter of the Forest, would help to discourage those users determined to access the trail. This could be done in conjunction with the removal of non-native species.
3. Put a discreet sign at or near the trail entrance indicating that the surrounding habitat is an ecologically sensitive area that is being rehabilitated (see section regarding signage for recommendations).
4. Plant native species along the unauthorized trail for about 25 metres from its beginning. It is recommended that armed plants be used where ecologically suitable. These plants would make travel through the brush more difficult and uncomfortable. Examples of such plants for Green Timbers are salmonberry in wetter areas and wild rose in drier areas.
5. Erect a wood fence barrier to a height of 1.3 metres to block access. These types of fences have been successful in other parks such as the GVRD's Pacific Spirit Regional Park.

Primary concerns regarding the trail system:

- The current trail classification does not reflect their conditions or the traffic they experience
- There are a number of currently unauthorized trails used extensively as they provide important access, a varied trail surface and a different nature experience
- Many unauthorized trails lead into ecologically sensitive areas, threatening their integrity
- There are a number of unauthorized trails in the proposed Environmental Protection/Wildlife Refuge Zone
- There are unauthorized trails in the blowdown area presenting a safety concern for park visitors.
- Some unauthorized trails run through King Creek causing sedimentation and damage to the riparian areas
- Unauthorized trails present safety and liability concerns for the City, as they are not maintained
- There are no signs indicating that these trails are unauthorized
- There is the likelihood that further unauthorized trails will grow from the present ones
- There is poor access to the trail system south of 96th Ave.
- The trail system south of 96th Ave. does not produce a continuous loop
- There are no official names for all of the trails
- There are no up to date maps of the Forest indicating trail uses and locations
- Trail use will increase with growth in population, the implementation of the Greenways Plan and as the Forest increases in popularity
- There are no safe crossings of 100th St., 96th St and the Fraser Highway
- There is no proper crossing of King creek along the 92nd Ave. trail

- The western edge of the Moss trail is difficult to identify as the adjacent vegetation is being trampled

Recommendations regarding the trail system:

- Upgrade the classification of the current trail system to reflect the increase in traffic and the proposed Greenways route
- Work with the planning department to finalize those trails that are to become a part of the proposed Greenways plan and 92nd Ave. right of way
- Authorize currently unauthorized trails as discussed above
- Update the trails to their new classification standards
- Close all unauthorized trails as follows:
 1. The trails running through King Creek between Sword Fern trail and King Creek trail
 2. All trails in the environmental/wildlife refuge zone
 3. The trails running through the blowdown area
 4. Any trails running through the wetter ecosystem types (site series 12)
 5. All other unauthorized trails
- Follow the guidelines outlined in the NAARMS for trail closures
- Place no entry signs at or near unauthorized trailheads indicating the trail is closed
- Create a bridge crossing of King Creek along the Lady Fern trail
- Produce an annual inventory of all unauthorized trails and their priority for closure
- Inspect and maintain all authorized trails on an annual basis
- Produce a new updated trail system map indicating their recommended uses and expected risks
- Create the two proposed trails south of 96th Ave (Lilly trail and the 144th Ave access to King Creek trail)
- Decommission 144th St and build the Ferris trail that connects 92nd Ave to the south end of the East Cascara trail
- Close the King Creek Trail during wind storms
- Pursue options for a safe pedestrian/wildlife crossings of 100th Ave, 96th Ave and the Fraser Highway where the trails on either side of the road intersect them

Signage

Signage is an extremely important aspect of park management. City employees cannot patrol every park at all times to ensure that they are being used responsibly. Therefore, a certain amount of signage is required in each park to ensure the safety of its users, to indicate rules and regulations, to promote education and stewardship and to help minimize the impacts on its ecology.

It has been noted during the compilation of this plan that there is no consistent design or plan for signage within Green Timbers Urban Forest. Many of the current signs vary in text, fonts, sizes, supporting posts and colors. Within the Forest some of the signs have little impact and/or are not necessary. A standardized signage system should be developed to eliminate these problems and minimize the number of signs within the Forest. An inventory has been completed of the current signage system as is illustrated in Figures 15-18.

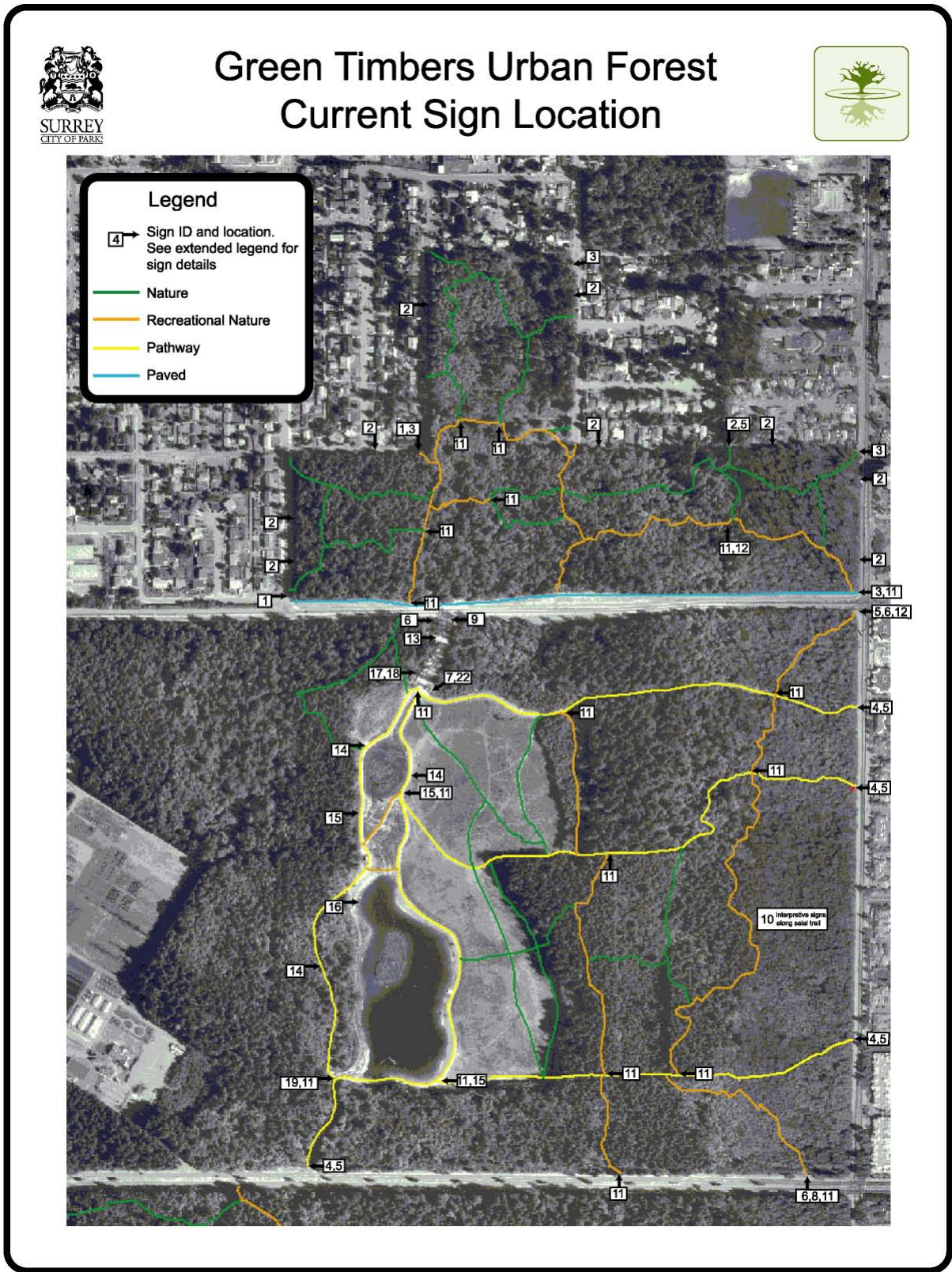


Figure 15 Current locations of signage, north end

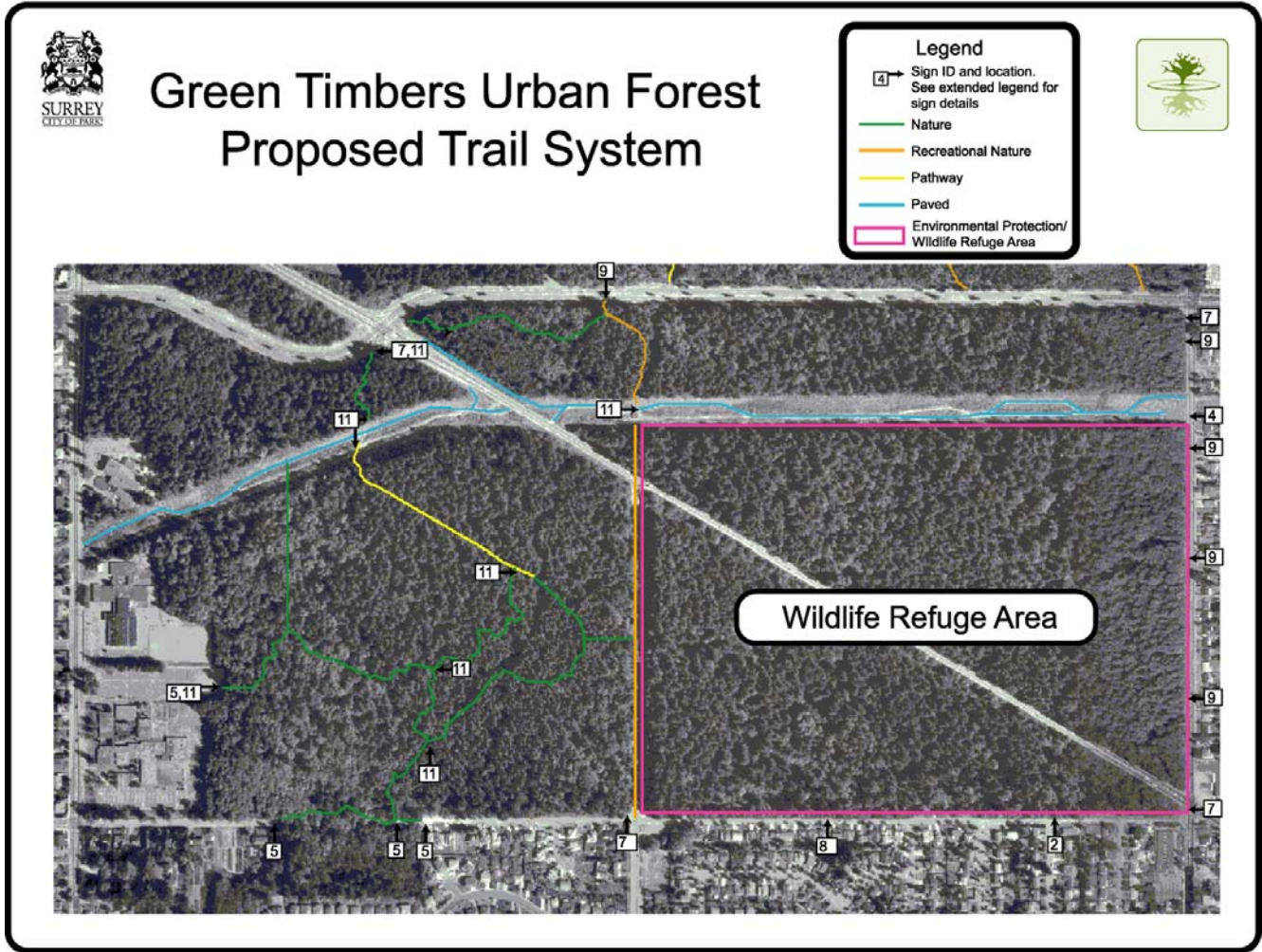


Figure 16 Current locations of signage, south end

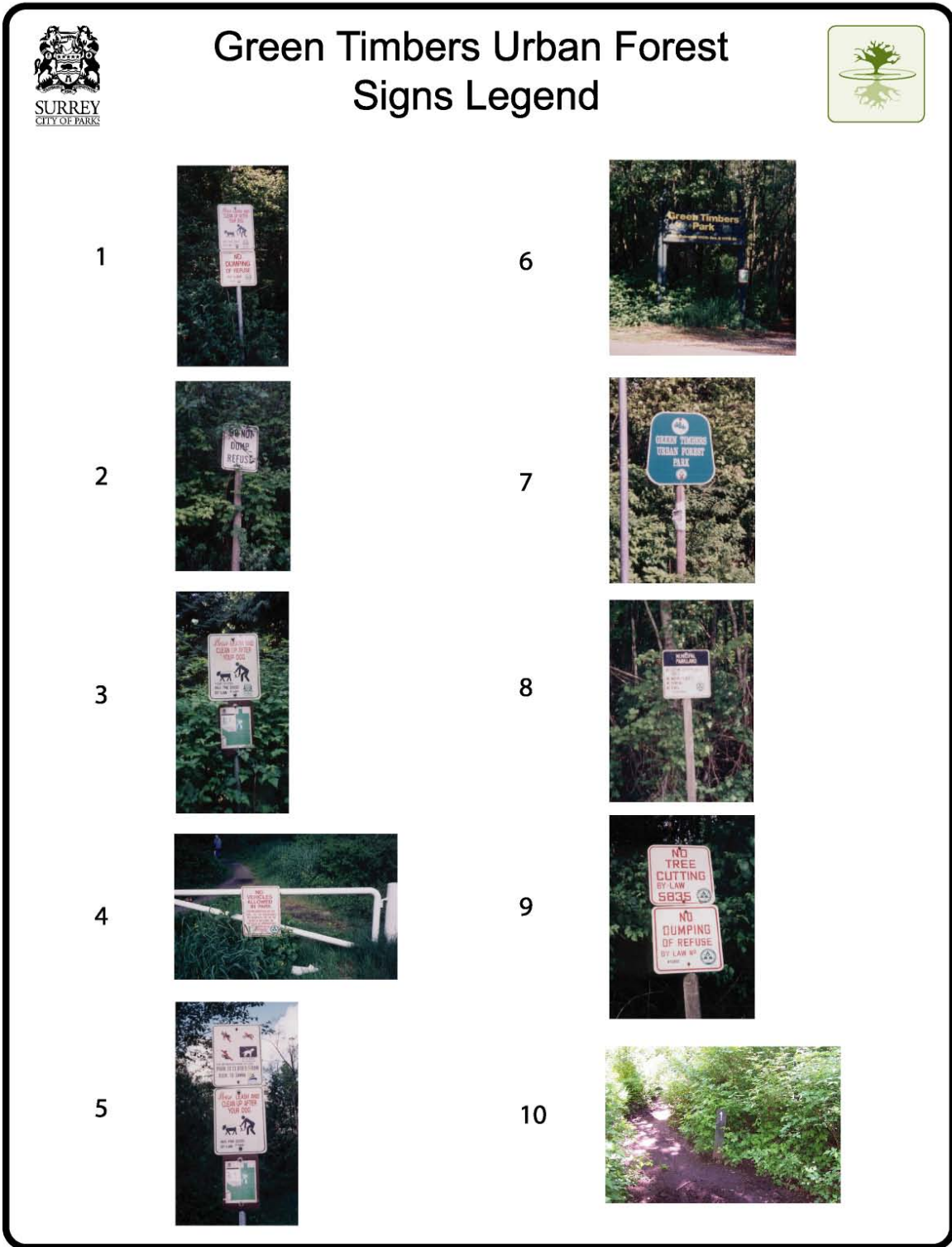


Figure 17 Current signage, legend 1



Green Timbers Urban Forest Signs Legend



11		15	
12		16	
13		17	
14		18	
		19	

Figure 18 Current signage, legend 2

Effective signage should communicate a message quickly and efficiently. A standard style including font, typography, image and logo should be established for all sign in the Forest. Wherever possible images should be used to convey information rather than words as they have proven to be more effective. These visuals speak to a wider audience and do not necessarily require the viewer to read or understand one particular language. There should also be an attempt to stack images or set them alongside each other when possible in order to minimize their spatial impact.

Green Timbers Urban Forest is one of the largest protected areas within the City of Surrey. It was preserved largely following extensive lobbying by the public. This history along with the intrinsic values within the Forest merits a unique color scheme and trademark image for its signage system. This will help ensure that the public is aware that they are in a park that deserves special consideration.

Primary concerns regarding signage:

- There are too many signs in and adjacent to the Urban Forest, taking away from ones 'nature' experience
- There is no consistent design or plan for signage within the Forest
- Many of the signs are ineffective because they are too wordy
- Many of the posts and signs are too large and/or tall, reducing the aesthetic quality of the Forest
- There are no up to date maps of the Forest indicating the location of authorized trails, sensitive ecological areas and trail closures
- Many of the signs are frequently vandalized
- Signage should be improved regarding sensitive ecosystems and wildlife
- There are not enough signs indicating:
 - the trail names, their associated risk, etiquette and permitted use
 - the potential risks associated with the Urban Forest
 - no dumping of waste and garbage around the perimeter of the Forest
 - that dogs must be on a leash and that their excrement be properly disposed of
 - the ecologically sensitive areas within the Forest
 - the location of the Environmental Protection/Wildlife Refuge Zone and other ecologically sensitive areas
- the fire hazards in and around the Forest (as recommended in the *Green Timbers Forest Fire Management Plan* City of Surrey, 2002)

Recommendations regarding signage:

- Remove and post signage as recommended and illustrated in Figures 25 and 26.
- The signage system should follow a similar theme. All signs should use Gill Sans font with a green (Pantone 356) background with yellow text (Pantone 116). This is the same color as used for the other Urban Forest, Sunnyside Acres
- The Green Timbers Urban Forest logo and the City of Surrey crest should always be located on at least one sign at the entrance to all trails starting from a roadway
- All signs should be manufactured using metal sign placards, lettering and images should be made from adhesive vinyl and they should all be anti graffiti coated
- Use a network of wooden posts similar to those currently used for trail names. Small metal signs will be used that state the trail names on either side of the post parallel to the trail. Where applicable, use the front side of the post to place dog rules, no smoking and shared trail signs as seen in Figure 20. The height of the post can vary in height from 0.5 to 1.5 meters
- Use a network of metal posts, similar to those already found in the Forest, for signs requiring significant amounts of written text. These posts can vary in height from 1.0 to 2.0 meters. This is the least natural-looking post, but is the most durable and least likely to be vandalized

The following are recommendations for the required signs to be located in and around the Forest. The numbers associated with each of the recommended signs refers to those locations illustrated in Figures 25 and 26.

1- Dog Regulations

This sign should indicate that dogs must be on leashes and that owners must clean up their waste. As this is one of the primary concerns for users of the Forest, these signs should be clearly posted at the entrances to all trails in the Forest. This message can be clearly portrayed using images similar to the ones already in use.



Figure 19 An example of an effective dog regulations sign already in use

2- Trail Names

Signs should be produced indicating the names of each trail and posted parallel to the trails similar to that shown in Figure 20 (example from the GVRD). They should be placed at all entrances and major intersections within the Forest. Recommended posts should be slightly lower than those shown.



Figure 20 An example of a consistent and efficient signage system used by the GVRD

3- Shared Trail Sign

At every major trail entrance, there should be a small sign put on a square wooden post indicating permitted use and right of way. There are currently no restrictions on any of the trails in the Forest and a shared trail sign that uses images similar to that shown in Figure 21 is very effective.



Figure 21 Example of an effective user group and trail right of way sign from the GVRD's Pacific Spirit Regional Park

4- Risks and regulations associated with the Forest

At the entrances to all trails, there should be a sign indicating the nature of risk associated with entering and using the trails within the Forest. It should state information regarding the tread surface of the trail, the potential for hazards and the risks associated with running into other user groups. Basic regulations regarding biking under control should also be indicated on this sign.

5- Trail closure

The trail closure signs should be low to the ground but clearly visible to anyone thinking of entering the trail. They should indicate that the trail is closed and state the reason for its closure. These signs should be posted at or near all unauthorized trail entrances until there is no longer an indication of its use.

6- Illegal Dumping

Currently, there are scattered “no dumping” signs around the perimeter of the Forest. A more effective sign similar to that in Figure 22 would encourage Forest visitors and nearby residents to report violations and to compost at home.



Figure 22 An example of a no dumping sign already in use by the City of Surrey

7- Fire Hazard/awareness

Two main fire hazard awareness signs should be posted at the entrance to the parking lot off of 100th Ave. and along 96th Ave. These signs should indicate the current Ministry of Forests fire hazard rating and a number to call if a wildfire is found in the Forest. This information should be on both sides of the sign so that it can be seen by traffic coming from both directions.

Small fire awareness signs should be placed in the meadow area, the Eastern White Pine plantation and the blowdown area. These signs should indicate that there is a high risk of ignition in these areas and that smoking is not permitted.

8- Interpretive Signage

There is already an interpretive sign system running along the Salal trail. It is recommended that the interpretive signage along this trail be updated and maintained. The existing posts should be replaced by signs (10cm by 10cm) on a square wooden post, coming 30cm out of the ground. These numbers correspond to an interpretive brochure found on the City's website explaining the unique ecological features and habitats of the Forest. The interpretative trail guide should be updated yearly to keep visitors interest. This brochure will be provided at both kiosks, the Parks Division website or at any of the Parks Department offices.

9- Blowdown Hazard

This sign should be posted at both ends of the King Creek trail where it runs through the blowdown hazard area. It should indicate the risks of traveling through this area, that smoking is not permitted due to the high fire hazard and that the trail is closed during wind storms.

10- Information Kiosks

There are two kiosks, one located at the main parking lot off of 100th Ave. and another at the corner of 100th Ave. and 144th St. Both of these kiosks should contain a substantial amount of information regarding the Forest's trail system, etiquette, ecological features, rules and regulations, associated risks, brochures and current events. It should include a detailed map of

the entire Forest including its trail network, facilities and significant natural features. An example of an effective kiosk is that in Figure 29. These kiosks should have a container for bags for dog waste. Bags can be provided by park visitors and volunteers.

11- Green Timbers Sign - Small

This sign should indicate that this area is an Urban Forest. It should be similar to the sign currently used in Figure 23. It should be located at strategic locations around the perimeter of the Forest.



Figure 23 Small Green Timbers sign found around the Forest

12- Green Timbers Sign - Large

There are currently three large Green Timbers Urban Forest greeting signs that are all in good condition. Once they need replacing they should be updated to the new color and font standards and include the City of Surrey Crest.

13- Environmental Protection Area/ Wildlife Refuge Zone

A sign should be placed frequently around the perimeter of the Environmental Protection/Wildlife Refuge Zone and adjacent to the lake. It should state "Environmental Protection/Wildlife Refuge Area. Please stay out, your harming us with your curiosity." An image of a deer and a bird should accompany this statement. This sign can be placed on the same post as the no dumping sign.

14- Green Timbers Lake Fishing Sign

The sign regarding fishing and its regulations should contain the same information as the existing signs but with the new color and font standards as discussed above. The current sign is very wordy and should contain images wherever possible.

15- Meadow-sensitive ecosystem

There is a concern that many of the wildlife species that visit the meadow are not nesting there because visitors do not stay on the authorized trails. Install signage with a picture of a vole or rabbit on it that states "You are harming us with your curiosity, please keep your dog leashed and stay on the designated trail"

16- Educational Signs

These existing educational signs illustrate basic ecology of the forest and meadow area. They can be left as is and updated in the future to include more information regarding the sensitive ecosystems and rare and endangered species in the Forest.

17- Wildlife feeding

There is a concern that many of the wildlife species within the park are being unduly harmed by visitors feeding them. Install signage that states “You are harming us with your generosity, please do not feed us”

18- Lake and Creek-sensitive ecosystem

Both King Creek and the lake are being degraded by visitors, bikers and dogs. They are disturbing the resident fish and wildlife and degrading its riparian vegetation. Install signage similar to that found in Figure 24 explaining the importance of preserving aquatic and riparian habitat.



Figure 24 Example of an effective sensitive ecosystem sign

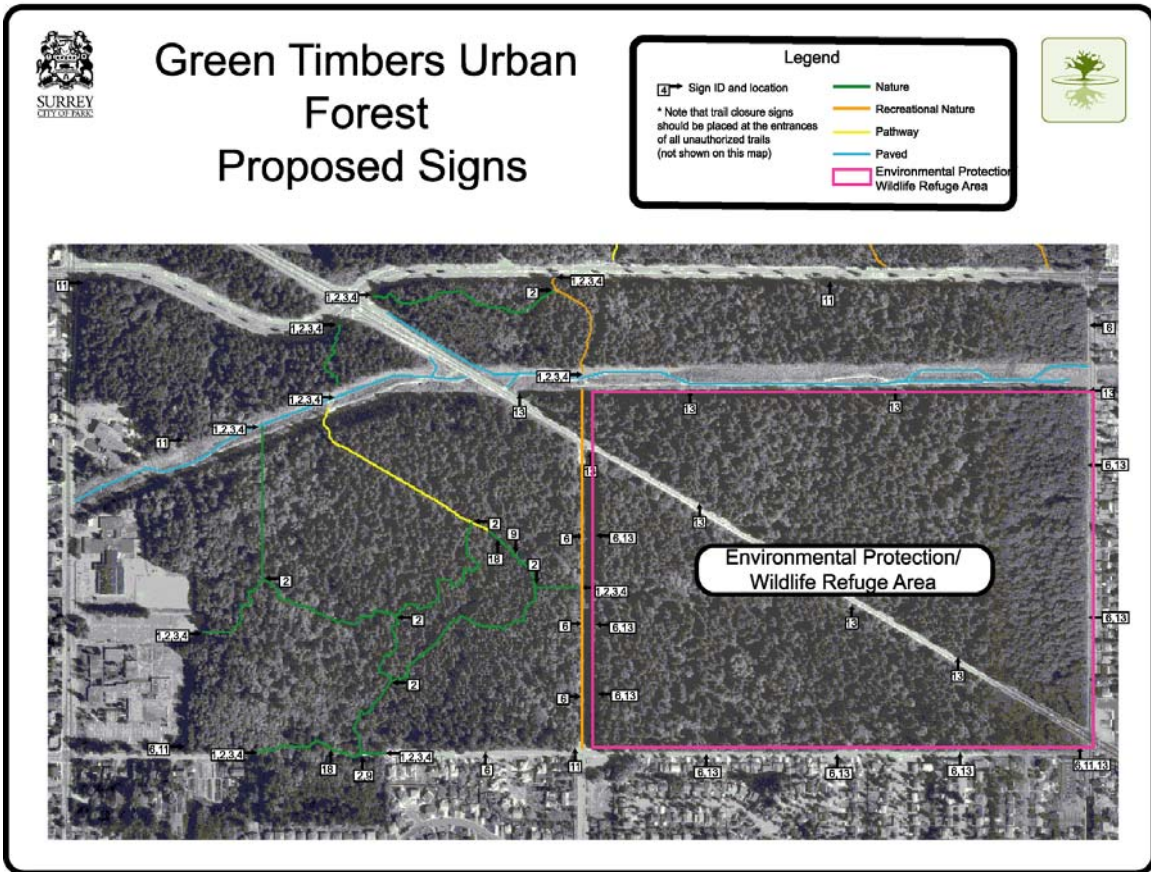


Figure 26 Proposed locations of signs

Facilities

Public Toilets

There is one public toilet facility located adjacent to the main parking lot. This is a logical location as the majority of visitors enter and leave the Forest from this location. Additionally, it is easily accessible from both the popular meadow area as well as the trails to the north of 100th Ave. There are currently no public toilets that are easily accessible from the trail system south of 96th Ave. This area experiences much less traffic and does not warrant the installation of a toilet at this time. The location of this facility should be clearly indicated on all maps of the forest including those trail maps posted south of 96th Ave.



Figure 27 The public toilets located adjacent to the main parking lot

Primary concerns regarding public toilets:

- Many of the trail maps do not show the location of these toilets
- Visitors using the trail system south of 96th Ave may not wish to travel all the way to the current location
- They are closed during weekdays in the off season

Recommendations regarding public toilets:

- All maps of the Forest should show where toilet facilities are located and when they are open

Kiosks

There are currently two kiosks in the Forest. The main one is located at the entrance to the Forest from the 100th Ave. parking lot. It contains a trail map and basic information regarding the ecology of the Forest and its history. There is also a container to hold brochures. Some modifications should be made to this kiosk. The trail map should be updated to reflect the changes outlined in this plan. Additionally there should be signs indicating trail etiquette, rules and regulations and associated risks. If the interpretive trail is updated, brochures should be available here. There could also be an area to post information regarding upcoming events. An example of an effective Kiosk is of that developed by the GVRD in Figure 28.

At this kiosk there should also be a designated area to indicate the rules for dogs within the Forest. This sign should indicate the etiquette for dogs including the leash laws and emphasizing the importance of picking up and disposing of dog waste. The kiosk should have a container for dog waste bags. The location of Tynehead and Freedom parks the two closest off-leash parks should also be clearly illustrated.

There is a smaller kiosk located at the entrance to the Salal trail at the corner of 144th St. and 100th Ave. This entrance is not as frequently used as the main parking area but should also contain an up to date trails map and signs indicating the trail etiquette, rules and regulations and associated risks. The kiosk should also have a container for dog waste bags. This is where the original interpretive trail brochures were located. If this interpretative system is updated, the new brochures should also be located here.

Primary concerns regarding the kiosks:

- The current map does not display the up to date authorized trails, trail etiquette, rules and regulations and associated risks
- The current map does not indicate the ecologically sensitive areas of the Forest
- There is not enough emphasis on the regulations regarding dogs in the Forest
- There are no dog waste bags supplied in the Forest

Recommendations regarding the kiosks:

- Ensure there is an area on all kiosks where the public can post information pertaining to the Forest and community involvement. However it should be required that all material posted must be approved by the Parks Division
- A sign should be posted describing the risks associated with the Forest, permitted use and critical ecological features
- Install an updated map of the Forest, facilities and its authorized trail system and etiquette and associated risks
- Signs should be posted which clearly emphasize the regulations regarding dogs in the Forest
- A box should be attached to the Kiosk where dog owners can leave extra bags for dog waste disposal
- The locations of Tynehead, a GVRD park and Freedom park, a City of Surrey park, should be indicated.



Figure 28 An example of a kiosk found at the GVRD's Pacific Spirit Regional Park

Gates and Fencing

There are a variety of fences used at the entrances to the trails throughout the Forest. Many of the larger trails have a metal fence such as that in Figure 29. Some of the smaller trails have either a metal post or wooden baffles. These barriers are effective in keeping vehicles out of the Forest and slowing down bicyclists. These entrances are wide enough for all user groups.

It is recommended that over time the metal posts used at the entrances be replaced with wooden posts. The wooden posts would provide a more natural look and would be consistent with the posts to be used for the new signs. Entrances which currently contain metal gates should not be replaced as they provide important access for parks and emergency vehicles.



Figure 29 Gates and posts currently used in the Forest

Fencing is an effective means of keeping Forest visitors and their pets away from sensitive ecosystems or areas under rehabilitation. Two types of fences can be built. The first is a wooden fence, similar to that found in Figure 30 and the second is a wire/wood fence seen in Figure 31. These types of fencing should be placed adjacent to the sensitive ecosystem or rehabilitated area and should be long enough so that either end of the fence has restricted access due to extensive brush or woody debris found there.



Figure 30 Effective use of wooden fencing



Figure 31 Effective use of wooden fencing

Primary concerns regarding fencing:

- The fences used at the entrances to the trails are not consistent
- There are no fences to discourage dumping along the north side of 92nd Ave and south side of 101st Ave
- There are no fences adjacent to sensitive ecosystems being degraded

Recommendations regarding fencing:

- Where there are no metal gates, wooden posts should be used to block the trail entrances
- Consider erecting a small wood fence along the north side of 101 and 92nd Ave. to discourage excessive dumping and access into the ecologically sensitive zone. A small wooden fence is more natural looking as compared to a metal fence.

Garbage containers

There are garbage containers located at the main parking lot and at strategic locations in around the lake area. This area experiences the majority of the traffic in the Forest, including dogs. There are some problems with garbage being left in the lake and it is important to keep providing these containers around this area. Garbage containers also encourage dog owners to pick up after their dogs as they provide a quick means of disposing of the waste.

Primary concerns regarding garbage containers:

- There is excessive garbage left in the lake and surrounding area
- There are no garbage containers in the eastern portion of the Forest to encourage dog owners to pick up after their dogs.

Recommendations regarding garbage containers:

- Maintain the garbage containers around the lake area
- Provide two more garbage containers at the intersections of the Salal trail and Douglas-fir trail as well as the intersection of the Salal trail and cedar trail

Parking Facilities

The main parking lot for the Forest located along the south side of 100th Ave. It is graveled and can accommodate up to fifty cars. This is the most frequently used access point into the Forest. A second parking lot is located on the BC Hydro right of way along 148th St. This lot can hold approximately fourteen cars. Most of the other trails entrances around the perimeter of the Forest are adjacent to residential neighborhoods with ample parking available. Currently, there is no need to increase the amount of parking in or around the Forest.

There have been questions raised for the need to pave the main parking area. This would eliminate the problem of continually grading this lot to eliminate pot holes. However, the gravel does serve to slow down drivers in the parking area where dogs and kids are frequently at risk. It is recommended that in light of more pressing issues that the parking lot surface be left as gravel at this time.

Primary concerns regarding parking:

- The gravel parking lot surface requires continual maintenance.

Recommendations regarding parking:

- No additional parking facilities or upgrades are required at this time

Street Crossings

Three main roads cross through Green Timbers Urban Forest, none of which has safe pedestrian crossings. These roads include 100th Ave., 96th Ave. and the Fraser Highway. Consequently, Forest visitors are discouraged from accessing other areas of the Forest from where they entered.

The section north of 100th Ave experiences moderate visitor traffic and those wishing to cross this road from the parking lot to access the entrance to Salmonbery trail are presented with a hazardous crossing. There are plans to widen this road to four lanes that would include putting in a pedestrian overpass at this point. This option would greatly improve public safety and access to the northern portion of the Forest.

The lack of safe crossings for pedestrians is one of the main reasons that the trail system is not used south of 96th Ave. The proposed Greenways route crosses 96th Ave to connect the East Cascara trail with the Willow trail. A safe crossing should be put in place here to ensure public safety. Additionally there should be a safe crossing of the Fraser Highway. There are proposals to permanently close 144th St. between the Fraser Highway and 92nd Ave. This proposal should include putting in a safe pedestrian overpass over the Fraser Highway. This and other options should be pursued to improve access to this portion of the Forest.

Primary concerns regarding street crossings:

- There are no safe public crossing across any of the three main roadways running through the Forest
- There are no safe crossings for wildlife across the three main roadways running through the Forest

Recommendations regarding street crossings:

- Options should be explored to produce safe crossing of Fraser Hwy, 100th Ave and 96th Ave. Pedestrian/wildlife overpasses and/or pedestrian/wildlife tunnels are the safest and preferred option.

User groups and Identification of Conflicts and Concerns

One of the primary reasons for developing an access and recreation management plan is to identify current and future concerns to do with the Forest, its protection and any issues or conflicts amongst the user groups. Over the past decade, Green Timbers Urban Forest has experienced a dramatic increase in the number of visitors. As urban development increases in the City of Surrey, the demands on the Forest will continue to grow, increasing the conflicts between user groups, the wildlife and the natural environment.

Much of the information used to develop this plan was compiled from surveys conducted within the park and the surrounding neighborhoods. Further information was gathered from consultation with staff from the City of Surrey, members of the Green Timbers Urban Forest advisory committee and representatives from recreation groups, local schools and businesses. In general, most people are more than satisfied with the care of the park, its facilities, signage and the access and recreation it provides. This is in part due to the 'signage throughout the park' and the public education campaigns that express the need to protect the ecology and habitat within the Forest. Members of the Green Timbers Heritage Society and representatives from the City of Surrey have conducted the majority of this public education work.

Most of the current conflicts are not yet at a level that requires significant changes in management. Many of the recommendations made in this plan address future concerns, so that when a conflict arises, Park representatives will already have a template in place to address the issue.

Conflict / Interaction Matrix

The following table helps to identify and quantify the conflicts and interactions that have occurred between both social and natural components in the Forest. The table entries indicate the level of conflict between the user groups, Forest facilities and natural features.

The level of conflict that exists between two elements has been categorized and labeled as follows:

- L – Low
- M – Medium
- H – High
- VH – Very High
- N/A – Not Applicable

Table 15 The conflict / interaction matrix

1 Running	2 Walking/ hiking	3 Dog walking	4 Mountain biking	5 Wildlife viewing	6 Plant communi- ties	7 Wildlife	8 Water quality	9 Trail system	10 Fishing	Elements of conflict
	L	H	M	L	L	L	L	L	L	1 Running
		H	M	L	L	L	L	L	L	2 Walking/ Hiking
			H	H	H	H	M	M	L	3 Dog Walking
				M	L	L	M	H	L	4 Mountain Biking
					L	L	L	L	L	5 Wildlife Viewing
						N/A	N/A	N/A	M	6 Plant communities
							L	N/A	M	7 Wildlife
								N/A	M	8 Water Quality
									L	9 Trail System
										10 Fishing

Conflicts between User Groups

The conflicts that exist between user groups in the Forest have been researched through extensive public consultation and interviews with appropriate agencies and organizations (see Appendix C). There is a low incidence of conflict between the various user groups in the Forest. Other parks in the Lower Mainland that experience heavy traffic show that the majority of conflicts occur between people on foot with dogs, mountain bikers and horseback riders. These types of conflicts have caused managers to partition off trails restricting specific user groups. So far, this type of segregation is not necessary at Green Timbers Urban Forest. However, it is recommended that the Parks Division keep a logbook of all user conflicts in the Forest. This will help to monitor the level of user conflict and determine if sections of this plan require updating.

Flora and Fauna

A number of principles were set forth in the citywide Natural Areas Access and Recreation Management Strategy (City of Surrey, 2000) to help protect and preserve the flora and fauna of natural areas. These principles include:

- Natural areas are valuable ecosystems and must be respected
- Wildlife must be protected in areas unfrequented by people
- Natural areas are for the benefit of the general public and should be shared
- Fragmentation of natural areas must be limited when providing access
- Recreational activities must be compatible with the site and must not unduly impact significant habitats and vegetation
- Regulations designed to protect natural areas should be developed and enforced

The Parks, Recreation and Culture Commission Policy Manual, (City of Surrey 1996) also emphasizes the need to protect the ecological integrity of the Urban Forests.

This policy manual states that:

- Each local Urban Forest Advisory Committee shall develop a trail system plan to facilitate controlled access to the forest that will be designated and maintained to have minimum impact on the surrounding environment and to preserve the natural character of the area.
- Each Local Urban Forest Advisory Committee should set aside areas in which public access is restricted in order to protect the forest from human disturbance.

Consistent with these higher level plans, the protection of flora and fauna within Green Timbers Urban Forest is a top priority. Throughout the planning process members of the Parks Division staff, the Green Timbers Advisory Committee and all user groups have re-emphasized this sentiment. It is recommended that the area bordered by 92nd Ave to the south, 96th Ave to the north, 148th St to the east and 144th St to the west is where human use is to be restricted. This area has a variety of ecotypes and provides excellent habitat for many wildlife species. This area does not receive many visitors and there are few trails within it to decommission. If the proposal to close 144th St. from 92nd Ave. to Fraser Hwy proceeds and a wildlife passage is built across Fraser Hwy, this area could again attract some larger mammals.

Larger mammals once inhabited the Forest such as the black tailed deer. These animals no longer use the Forest partly due to nearby development and the fragmentation of the forest by roads. Several major roads currently fragment Green Timbers. The City of Surrey asked Keystone Wildlife Research Ltd. for an investigation of road mitigation and construction techniques that would reduce and/or mitigate impacts of existing roads as well as future road widening on the Forest. The following include excerpts from Wildlife Connections at Green Timbers Urban Forest Park: Possibilities and Alternative Solutions (2002):

- Fraser Highway, 96th Ave, 100th Ave and 144th St., fragments the Forest. No mitigation for any of these roads was undertaken at the time they were constructed. Proposals have been made to widen both the Fraser Highway and 100th Ave or 96th Ave. Traffic loads in the Greater Vancouver Regional District are predicted to rise by 60% in the next two decades.
- The road-effect zone where ecological effects of roads are evident averages ~300 m. This varies by species but larger mammals like grizzly bears do not use habitat within 482 m of roads. This makes most of the Forest unsuitable habitat for many large mammals once their range is considered.
- Suitable mitigation strategies include the construction of wildlife passage structures, fencing installation and expansion of stormwater recycling.
- The closure and reclamation of 144th St south of Fraser Highway is recommended to decrease fragmentation within the park. This road is lightly traveled and its closure will join the two large blocks of forest south of Fraser Highway.

The plant communities that are most sensitive to disturbance are those found in wetlands and riparian areas of the lake and creeks. These areas are critical wildlife habitat components and are easily degraded by walkers, bikers and dogs running off leash. These areas also support the rare wildlife found in the Forest including the painted turtle and the red legged frog. Trails that

run adjacent or across these wetlands or riparian areas should be monitored for degradation and rehabilitation should be made a priority. Fencing should be installed along sensitive areas to keep off trail use to a minimum. Fencing recommendations can be found in the facilities section of this document.

Primary concerns regarding flora and fauna:

- Fragmentation of the Forest by roadways is inhibiting some mammals from using it
- There are no areas where human access is restricted to protect the natural ecology
- Flora and wildlife habitat sensitive to disturbance must be identified and protected
- Walkers, bikers and dogs traveling off the designated trail system are having a negative impact on some sensitive plant communities

Recommendations regarding flora and fauna:

- Reduce the fragmentation of the Forest by decommissioning 144th St. and constructing wildlife passage structures and installing fencing and stormwater recycling areas
- Set aside the area designated in this plan as the Environmental Protection/Wildlife Refuge Zone as a restricted area to human use
- Rehabilitate and protect sensitive ecosystems as identified in the ecology section of this report

Walking/Running/Wildlife Viewing

Those traveling in the Forest by foot have the least amount of impact on the natural environment. The majority of the conflicts between visitors on foot usually involve dog owners not leashing their dogs and bikers riding out of control. Recommendations to reduce these conflicts will be discussed in the following sections.

Bicyclists

Presently, the primary interest for the majority of the cyclists using the trails in the Forest is for the enjoyment of nature. However, many cyclists who ride in the Forest are also commuting to other areas of the City or are looking for challenging terrain to test their skills. These types of use result in conflicts with other user groups within the Forest. Only slow cycling within the Urban Forest is permitted (less than 10 km/hr) to minimize the chance of an accident and to ensure the right-of-way for pedestrians. One of the greatest risks of conflict in the Forest is a collision caused by a cyclist who is riding too fast and is not in control.

To this date there have been few complaints regarding bicyclists on the trails. This may be partly explained by the self-policing done by park visitors. Another explanation may be that many of the recreational riders are looking for a non-manicured trail and are therefore using either the unauthorized trails or nature trails where they are less likely to meet other people.

It is likely that conflicts stemming from mountain biking will increase in the Forest as the trails become more popular. The number of conflicts should be monitored carefully and documented in a conflict logbook to determine if more intensive management strategies are necessary.

Primary concerns regarding bicyclists:

- There is the potential for collisions with other visitors of the Forest caused by a cyclist who is riding too fast or is out of control
- There will likely be an increase in the number of bicyclists visiting the Forest it gains popularity
- Bikes can have a significant, negative impact on the plant communities when they go off designated trails and create unsanctioned trails

Recommendations regarding bicyclists:

- At the entrances to all trails, signs should be placed stating that competitive cycling is not permitted. These signs should inform cyclists to ride slowly and in a controlled manner.
- An effort should be made to better educate representatives of all user groups regarding the impacts of off-trail biking
- The Forest brochure should explain the degradation that a bike tire causes to trails. Future problems with cyclists may lead to the segregation of users on certain trails. Consider developing a bicycle loop that has optional, adjacent off-road trails.
- Monitor the number of conflicts associated with bicyclists and their locations within the Forest

Dogs

City Park By-law No. 13480 requires dogs to be leashed in City parks, primarily to ensure that dogs are controlled by their owners and will not pose a threat to others visiting the Forest. The greatest number of conflicts in the Forest to date stem from dog owners who do not leash or pick up after their dogs. This concern has been voiced throughout the public consultation process. A recent GVRD study, *Canine Conundrum in GVRD Parks*, found that 18% of non-dog park patrons experienced a dog conflict, and 23% of those reported the conflict was a personal safety threat. 96% of the total conflicts in this study involved dogs off-leash.

Primary concerns regarding dogs:

- Many people are afraid of dogs and do not like to encounter them off leash
- Some dogs tend to get in the way of bikers and runners, increasing the possibility of an accident
- Dogs will chase and scare the wildlife in the Forest
- Dogs off-leash often wander off the trail causing damage to the vegetation. This is especially prevalent in the meadow and in riparian areas as well as along the west side of Moss Trail.
- Dog waste is often not cleaned up by their owners. Droppings left on the trails makes the Forest less attractive to other user groups

Recommendations regarding dogs:

- There is Tynehead, a GVRD park and Freedom park, a City of Surrey park, that are close by and have areas where dogs are currently allowed to run off-leash. The locations of these parks should be stated at the kiosk at the main parking lot off 100th Ave.
- Place signs at the entrances to all trails indicating that dogs must be on a leash and that their owners must clean up after them
- Install a container for dog-waste bags at the kiosks. Volunteers can assist the Parks Division staff by stocking the container with bags
- By-law enforcers should visit the lake area more often than other areas of the Forest

Fishers and Lake Visitors

The lake area at Green Timbers Urban Forest offers a beautiful vista, wildlife viewing opportunities and a unique nature experience for those that visit it. However, it is a fragile ecosystem and is frequented more often than any other area of the Forest. The Willow trail runs along the southern and eastern edges of the lake. There is extensive damage to the riparian vegetation in these areas. The native vegetation in this riparian zone should be restored and specific access points can be designated for lake users. The western and northern edges of the lake are designated as wildlife reserves and are off limits to human use.

Primary concerns regarding fishers and lake visitors:

- People are trampling the riparian vegetation along the eastern and southern edges of the lake.
- Some dogs off leash are going into the water, scaring birds and trampling vegetation
- People are feeding unnatural foods to the wildlife in this area
- Some people fishing are not following the fishing regulations and are using barbed hooks

Recommendations regarding fishers and lake visitors:

- Restore native species along the eastern and southern banks of lake. Have the restored sections fenced off so that fishers and lake visitors are concentrated in specific areas.
- Place signs indicating that dogs must be on a leash and that owners must clean up after their dogs
- The current signage for the fishing rules is very wordy. It should be updated and use visuals where possible
- Signage should indicate the negative impacts of feeding the wildlife
- Bylaw enforcers must visit the lake more often than any other area in the Forest

Planned Events within Green Timbers Urban Forest

Apart from the most common user groups there are also organizations that plan special activities within the park. These include events such as park tours, fishing groups, the Teddy Bear Picnic, orienteering exercises, running, cycling and educational activities such as nature walks. Green Timbers Urban Forest is an excellent site for such activities because of its location, size, facilities and access. Many of these events involve a large number of people and depending on the activity may cause damage to the ecosystem and/or trails in the Forest. Additionally, there is a safety and liability concern that must be addressed when a large event is planned.

There has been little regulation of these activities in the past. Any organizations wishing to plan events involving more than approximately 20 people should obtain a special use permit from the Parks Department. This will allow the Parks Department to ensure the safety of all parties involved and to minimize the impacts on the ecology and trails in the park.

If an approved event will inconvenience any other users of the Forest, signs should be posted two weeks before the event. Additional facilities such as portable toilets and fencing can also be organized in conjunction with the Parks Department.

Primary concerns regarding planned events:

- Events involving large numbers of people threaten the ecology of the Forest and may damage the trail system
- There are a number of safety and liability issues that must be addressed when such a large event is planned

Recommendations regarding planned events:

- The Parks Department must issue a special use permit for events involving more than 20 participants. Activities that degrade the environment or go off the trails will not receive a permit
- In order for planned events to be approved, the applicant must provide a description of how the Forest is benefiting. The benefits must provide either ecological or historical, educational and/or provide plants and/or volunteer time to the Parks Department
- If an approved event will inconvenience other users in the Forest, signs must be posted two weeks before the event is planned
- The organization should work with the Parks Department to provide adequate facilities and ensure the safety of all Forest users

Access Management Zones

Green Timbers Urban Forest has been stratified into five distinct management zones. Within each of these zones, the management goals and the most critical factors affecting access management have been identified. They describe the intent of management and its associated risks, the carrying capacity of the site, the signage requirements and the facilities needed. The primary concerns regarding each zone are summarized at the end of each section.

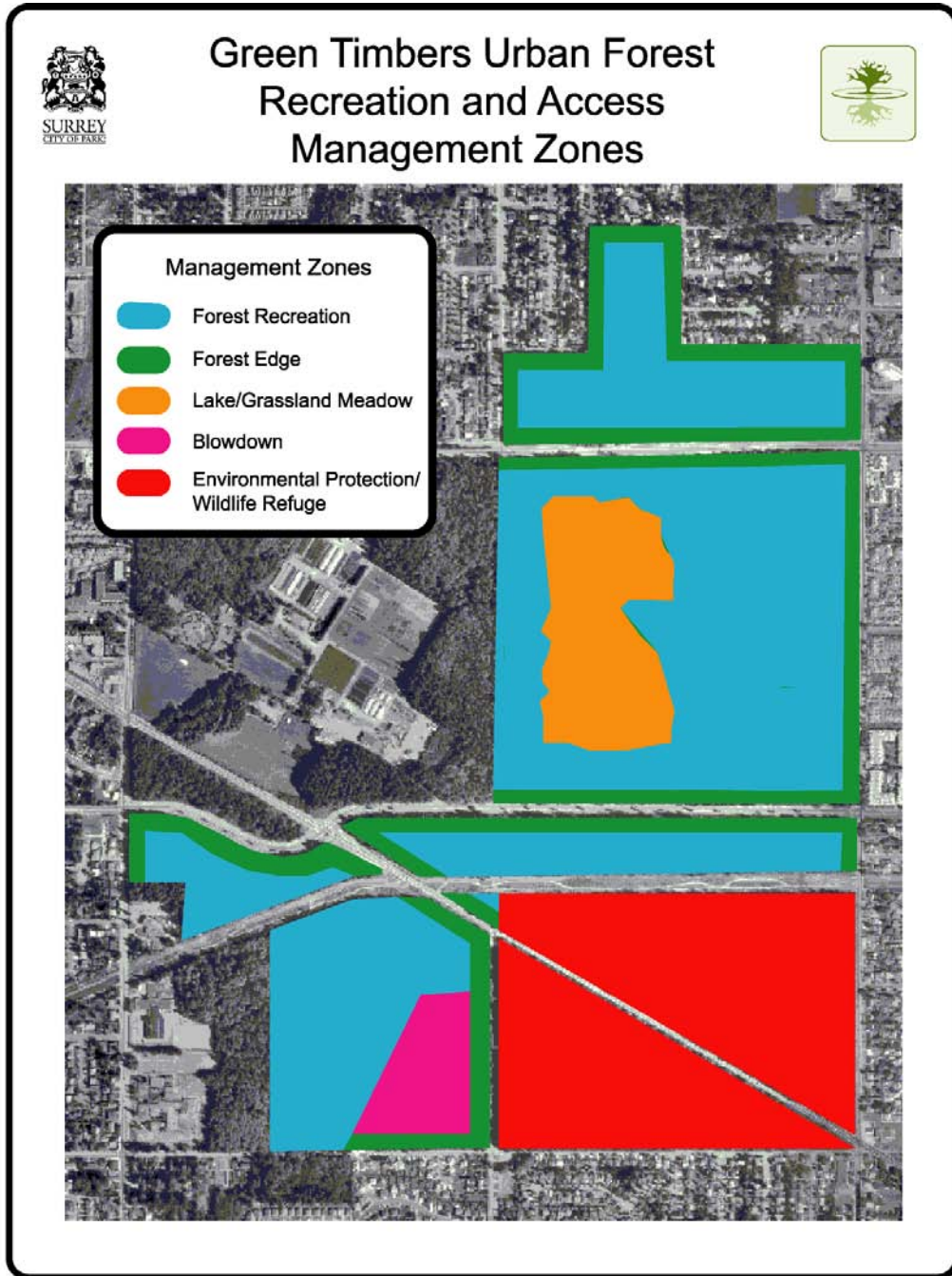


Figure 32 Access and Recreation Management Zones

Lake/Meadow Zone

This zone includes the meadow, creek and lake area that begins just south of the main parking lot off of 100th Ave. and extends southward to the end of the lake. The City of Surrey constructed the lake, meadow and the surrounding wetlands in 1986 to replicate the existing wetlands that naturally occurred there at the turn of the century. The moisture provided from the seepage upstream and the water from the pumphouse to this zone is critical to many plants and animals in the Forest. The meadow provides an open area for a variety of birds and small carnivores to hunt, and is home to numerous small mammals and rodents. The lake and creek provide essential water sources and a unique environment not found in other areas of the Forest. Consequently, this area greatly contributes to the overall biodiversity of the Forest.

The lake/meadow area is the most frequently visited portion of the Forest and unfortunately is at the greatest risk of being degraded. There are numerous unauthorized, braided trails running throughout the meadow area. Additionally visitors and dogs trampling the riparian vegetation have damaged the southern and eastern edges of the Lake. The western and northern edges of the lake are a wildlife reserve. This area should remain a priority for preservation to ensure secure water access for many wildlife species.

The meadow supports a variety of small mammals and rodent providing excellent hunting for predators. Wildlife habitat in this area could be enhanced by growing a few more coniferous trees, scattering coarse woody debris for ground cover and providing perimeter roosting sites for predator birds as necessary.

Primary concerns in the Lake/Meadow Zone

- The meadow is not a natural plant community for this climate
- Natural drainage patterns are being altered to produce the lake and wetlands
- The higher moisture levels in the wetlands make the existing trails prone to erosion faster than trails in other areas of the Forest
- Off trail use is causing damage to the sensitive plant communities on the east and south side of the lake and in the wetlands
- Non-native wildlife and plant species introduced in this area could drastically alter this ecosystem
- Dogs off leash and people walking off the trails are making numerous unauthorized trails through the meadow
- There are no areas for small mammals and rodents to hide or nest in the meadow

Recommendations regarding the Lake/Meadow Zone

- Make changes to the trails as per the trails section of this document
- Upgrade the signage as per the signage section of this document
- Continue to remove newly established trees in the meadow so that a forest canopy does not take over. Remove these seedlings manually with a brush saw rather than with a tractor to minimize damage to the wildlife and ecology
- Monitor this zone more frequently than the rest of the Forest for the establishment of unauthorized trails and dogs running off-leash
- Restore native species along eastern and southern banks of lake. Have restored sections fenced off so that fishers and lake visitors are concentrated in specific areas.
- Public education must include the impact non-native wildlife and plant species have on the flora and fauna of the lake, meadow and wetlands
- Wildlife habitat can be enhanced by growing occasional Douglas-fir trees, scattering coarse woody debris for ground cover and providing perimeter roosting sites for predator birds in the meadow as necessary.

Blowdown Zone

This zone is located in the southwest corner of the Forest. It was planted with Grand fir (*Abies grandis*) in 1932. The trees are growing on a compacted soil layer that has resulted in shallow rooting systems for the trees. A series of windstorms has caused extensive blowdown over the past 10 years. This has resulted in an open stand with scattered standing live and dead trees, a dense understory and extensive large downed woody debris.

This has created excellent habitat for a variety of wildlife species. The canopy is used by cavity nesting birds and mammals. There is dense ground cover of brush and coarse woody debris providing excellent habitat for a variety of small mammals and bird species.

The open canopies and shallow rooting of the remaining trees makes this area a high hazard for future blowdown. King Creek trail should be monitored regularly for hazard trees and the trail should be closed down during windstorms. Signage should be posted to warn of these hazards. The fuel accumulations in this area present a significant fire hazard. The sites where bonfires are frequent at the south end of this zone should be a priority for rehabilitation.

The riparian vegetation and creek bed of King Creek has been severely degraded from off-trail use and should be a priority to rehabilitate and close all the unauthorized trails.

Primary concerns in the Blowdown Zone

- There is a hazard of trees falling on visitors using this area
- Trails frequently require maintenance to remove windthrow following storms
- Fallen trees are contributing to heavy fuel loads and subsequently a high fire hazard
- Frequently used fire pits were found in the south end of this zone
- King Creek and its riparian zone are being degraded by people and their dogs traveling off trail

Recommendations regarding the Blowdown Zone

- Make changes to the trails as per the trails section of this document
- Upgrade the signage as per the signage section of this document including signs warning of the dangers of traveling in this area
- Monitor the trail for hazard trees and windthrow following windstorms
- Rehabilitate the fire pits and party areas at the south end of this zone
- Install fencing and rehabilitate the areas where the riparian zone of King Creek has **been** degraded. See Figures 30 and 31 for the type of recommended fencing.

Environmental Protection/Wildlife Refuge Zone

This zone is bordered by 92nd Ave. to the south, the BC Hydro right of way to the north, 144th St. to the east and 148th St. to the west. This area is unique and warrants special consideration as it contains sensitive plant communities as well as critical habitat for a variety of wildlife species. There are a number of wetlands, forest types and patches of very dense understory vegetation in this area. The diversity of plant communities and habitat features found in this area make it an excellent candidate for an Environmental Protection/Wildlife Refuge Zone. Restricting humans for this area is the most responsible course of action to ensure the future integrity of its unique ecological features and wildlife habitat. This recommendation coincides with the requirement stated in the Parks, Recreation and Culture Commission *Policy Manual* (1996).

- Each local Urban Forest Advisory Committee shall develop a trail system plan to facilitate controlled access to the forest that will be designated and maintained to have minimum impact on the surrounding environment and to preserve the natural character of the area.
- Each Local Urban Forest Advisory Committee should set aside areas in which public access is restricted in order to protect the forest from human disturbance.

This section of the Forest is not inhabited by many larger mammals because it is highly fragmented by Fraser Highway and 144th St. There have been proposals to rehabilitate 144th St. and create wildlife crossings of Fraser Highway. Both of these proposals would greatly enhance the wildlife values in this area.

There are a number of unauthorized trails currently being used in this area. It has been noted that some users of the Forest wish that there was a maintained trail system here. There have been some attempts to close a few of the trails in this area without much success. This is due in part to the lack of monitoring, resources to rehabilitate trails and efforts being concentrated at only one end of the trails. Closing down these trails and effectively monitoring its success is a priority. The need to preserve the ecological integrity of this area overrides the need for recreational pursuits within it.

This portion of the forest is also frequented by youth that seek remote and secluded areas to meet and party. These groups often build temporary shelters, light bonfires and leave garbage behind causing significant ecological degradation. There is also illegal dumping that occurs along 92nd Ave and 144th St. This encourages the establishment of non-native species threatening the natural plant communities.

Primary concerns in the Environmental Protection/Wildlife Refuge Zone

- There are a number of unauthorized trails being used throughout this area
- There have been numerous attempts by Parks Division staff to close and decommission trails in this area with little success
- This area is frequented by youth that set up temporary shelters, light bonfires and leave garbage behind
- This part of the Forest is highly fragmented by roads and therefore does not attract large mammals
- There are no signs stating that this area is an Environmental Protection/Wildlife Refuge Zone
- There is a significant amount of dumping and resulting invasive species growth in the sections adjacent to 92nd Ave. and 144th St.
- There are numerous tree hazards adjacent to roadways and sidewalks

Recommendations regarding the Environmental Protection/Wildlife Refuge Zone

- Make changes to the trails as per the trails section of this document
- Upgrade the signage as per the signage section of this document
- Monitor the non-sanctioned trails in this area for trespassers. This may require extensive work by Park Division staff, volunteers and Forest wardens for the first few years while the trails are being rehabilitated. This activity would be a good opportunity for secondary school youth to obtain their community service hours
- Maintain signage in this area more frequently than in other areas of the Forest
- Deliver brochures to residents adjacent to the Forest regarding the benefits of composting at home, the ecological sensitivity of this area and the damage caused by illegal dumping
- Remove all non-native plant species along 92nd Ave
- Dismantle and remove all shelters and fire pits built by party-goers. Rehabilitate these areas by replanting native plant species
- Erect a wooden fence along 92nd Ave. to prevent dumping and restrict access
- Install wildlife passages across Fraser Hwy
- Decommission 144th St. where it is adjacent to the Urban Forest and plant it with native species with a trail meandering through it.
- Regularly inspect roadways for tree hazards

Forest Recreation Zone

This zone includes the majority of the forested stands in the Forest. It is the largest and most frequently used management zone and contains the majority of the authorized trails. Consequently, this is where the majority of user conflicts occur. These conflicts arise primarily due to dogs off-leash and cyclists who ride quickly and recklessly.

This zone includes the majority of the wetter and more sensitive ecosystems in the Forest. The location and sensitivity of these ecosystems has been discussed in the ecology section of this document. They are generally dominated by deciduous tree species and contain dense understory brush communities. The biodiversity that is found in this zone supports numerous wildlife species including birds, small mammals, rodents and amphibians. Additionally, most of the rare and endangered plant species that could potentially inhabit the Forest include those that grow in similar wet environments. These areas are also prone to degradation due to the high moisture levels and more sensitive plant communities within it. Trails in these areas should be covered with gravel and/or boardwalks when pooling is a problem.

To the east of the lake area a 2-hectare grove of Eastern White Pine (*Pinus Strobus*) was planted as an experimental trial in 1932. This species is not well adapted to the climate of coastal BC and consequently this stand is unhealthy and its growth is stagnant. These trees are generally tall and thin with little live crown. There is a significant fire hazard with this stand because of its high density of live and dead trees, the flammability characteristics of the species and the accumulation of downed woody debris and needles on the ground. Recommendations have been made in the Green Timbers Fire Management Plan to remove some of the fuel accumulations in this stand. It is recommended that in conjunction with this treatment a plan be established to restore a native plant community.

King Creek, a fish-bearing stream, also runs through this zone and is sensitive to sedimentation from people and dogs passing through it. Rehabilitation of the creek and its riparian vegetation should be a priority and monitored carefully. A footbridge should be built over the Creek where the Lady fern trail crosses it. Additionally, the understory vegetation along the west side of the Moss trail has been severely degraded by off-trail use and should be replanted.

Primary concerns in the Forest Recreation Zone

- Dogs are being left to run off-leash
- Dog owners are not cleaning up after their dogs
- Bikers riding too quickly and out of control
- The higher moisture levels in some areas make the existing trail edges prone to erosion faster than trails in other areas of the Forest
- Off trail use is causing damage to the sensitive plant communities including wetlands and the riparian vegetation of King Creek
- There is no proper crossing of King Creek along the Lady Fern trail
- The understory vegetation along the west side of the Moss trail has been severely degraded by off-trail use
- The Eastern White Pine plantation is not a native species for this climate, is in poor health and is a significant fire hazard

Recommendations regarding the Forest Recreation Zone

- Make changes to the trails as per the trails section of this document
- Upgrade the signage as per the signage section of this document
- Produce educational brochures regarding trail etiquette, its risks and regulations and to minimize conflicts
- Monitor the wetter ecosystem types more frequently than the rest of the Forest for the establishment of unauthorized trails and dogs running off-leash
- Place gravel or boardwalks where trails are consistently wet
- All unauthorized trails across King Creek should be a priority for closure

- A small footbridge should be built over King Creek along the Lady Fern trail
- Reduce the fire hazard in the Eastern White Pine plantation and propose a plan to restore this to a native plant community

Forest Edge Zone

The Forest Edge Zone consists of the fringe areas of the Forest interfacing with the surrounding streets and residences. The management goal for this area is to enhance the natural elements of the Forest in order to maintain a safe natural appearing streetscape. This area of the Forest is of special concern as it is exposed to a high degree of vehicle and pedestrian traffic. There is also a significant amount of illegal dumping of garbage and garden waste in these fringe areas. Therefore, it is susceptible to the introduction of non-native species.

Most of the Forest boundary edges are well forested although the shrub layer in many places has been adversely impacted due to the dumping of debris and street work. In places this has resulted in an unnatural, messy and unkempt look. A gradual clean up and restoration of the forest edge is proposed. The intent is to retain a transition landscape between the urban environment and the forest, thereby showing that the Forest is well managed and respected.

Primary concerns in the Forest Edge Zone

- There are numerous trailheads to unauthorized trails
- This zone is subject to illegal dumping, which has resulted in the introduction of numerous non-native species
- There is garbage accumulating from passing traffic and pedestrians
- There are numerous tree hazards adjacent to roadways and sidewalks

Recommendations regarding the Forest Edge Zone

- Make changes to the trails as per the trails section of this document
- Upgrade the signage as per the signage section of this document
- Establish volunteer groups that can perform a gradual clean-up and maintenance program for the forest edge. Local schools are good candidates for such a program
- Aggressively remove all non-native species from this zone
- Educate the local residents regarding the impacts of dumping garbage and garden refuse in the Forest. An educational brochure can be distributed with a description of the Forest's ecology and information regarding composting
- Consult with volunteers and interest groups involved with the Forest to ensure that illegal dumping is reported to the Parks Division
- Erect a wooden fence along 101 Ave. to help prevent dumping
- Regularly inspect roadways for tree hazards

Public Education Opportunities

Parks offer a unique natural experience within urban settings. These areas provide a tremendous opportunity for people to learn about our natural environment. Through education and awareness, the users of a park often gain a sense of ownership where they develop an appreciation and understanding of the park's resources and features. Consequently, the users are more inclined to help preserve the ecological integrity of the park. The following are recommendations for improving public knowledge and awareness regarding the ecology of the Forest.

Interpretive Trail

An interpretive trail is an excellent way of increasing the awareness of significant ecological features within the Forest. Points of interest are identified along a section of trail and its ecological characteristics or processes are described.

An educational brochure can also be produced that contains interesting ecological facts and information corresponding to numbered plaques. This type of brochure could be distributed to school groups and be available to the public at both kiosks or available from the City's website. This is an inexpensive and discreet way of educating the public about the unique ecological features in the Forest.

Green Timbers Urban Forest Brochures

This Forest contains many unique ecological features including sensitive ecosystem types, rare and endangered species and a wide diversity of habitat for wildlife. It would be a good idea to produce some small educational brochures that can be available at the kiosks or simply posted on the website for the public to view. This brochure could have an updated trail map, describe the rarity of the Forest's ecosystems and the unique features found within it. It could also raise awareness regarding the blowdown centres, the environmental protection/wildlife refuge zone and the wildfire hazard in the Forest. Another brochure could explain trail etiquette and guidelines similar to that put forth in *Trail Use Guidelines & Code of Etiquette* (GVRD, 1998). If dogs off leash and their waste continue to pose a problem in the Forest, a brochure similar to the *Your Dog* (GVRD, 2000) handout could be produced. The more educated the public are about these issues, the more inclined they will be to self-regulate the Forest.

Liaison with User Groups

Before this area became an Urban Forest, many nearby residents were frequent users of the existing trail network. The local community lobbied to have the area set aside in perpetuity by public referendum, and when this happened, the City of Surrey had many Forest supporters. To continue community involvement and to assist in patrolling and maintaining this area, the Parks Division should establish a working relationship with representatives of the different groups using the Forest. These representatives could be educated about the sensitive areas in the Forest and how and where potential conflicts with other user groups can occur. They could then pass this information onto their members and assist the Parks Division in future planning or other Forest improvement projects.

Website Design

The dramatic increase in the popularity of the World Wide Web has changed the way we share and distribute information. It is increasingly important to make information available over the Internet. It is the simplest and cheapest means of reaching the greatest proportion of the public. This is especially true for the younger generation that has grown up with the Internet. It is recommended that the Parks Division produce a link on their website where information similar to that printed in the brochures can be posted regarding the Forest and its unique features. The website could also be used by the public to provide feedback regarding the management of the Forest.

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Appendix A Ecological Inventory Database

Table 16 Ecological Inventory

POLYGON	ASP	SL	SL_POS	PHYSIO	TERR_CLS	HUMUS_	FF_DEPTH	SOIL_TXT	SOIL_CF	BGC_UNIT	SS1	SS1%	SS2	SS2%	SS3	SS3%	SMR_SNR
1	263	10	Mid	Ev	Wb	Mor	11	SL	40	CWHdm	1	100					4/C
2	180	8	Fl	Ev	Wb	Mor	13	SL	30	CWHdm	1	80	5	20			4/C(D)
3	999	0	Fl	Ev	Wb	Moder	7	SL	35	CWHdm	5	90	7	10			4-(5)/D
4	999	0	Fl	Ev(Hu)	Wb	Organic		O	0	CWHdm	12	60	7	40			(6)-7/D
5	999	0	Fl	Ev(Hu)	Wb	Moder	4	SL	10	CWHdm	5	60	7	40			5-(6)/D
6	999	0	Fl	Ev	Wb	Moder	5	SL	25	CWHdm	5	70	7	30			4-(5)/D
7	999	0	Fl	Ev	Wb	Moder	9	SL	30	CWHdm	7	80	12	20			5-6(7)/D
8	999	0	Fl	Ev	Wb	Mor	13	SL	35	CWHdm	1	60	5	40			4-/C-D
9	999	0	Fl	Ev(Hu)	Wb	Moder	4	SL	10	CWHdm	7	70	5	30			(5)6/D-E
10	999	0	Fl	Ev	Wb	Moder	5	SL	25	CWHdm	12	100					7/D
11	999	0	Fl	Ev	Wb	Moder	5	SL	30	CWHdm	7	95	12	5			5-(7)-D
12	999	0	Fl	Ev	Wb	Moder	3	LS	25	CWHdm	5	60	1	40			4/D-(C)
13	Disturbed site																
14	999	0	Fl	Ev	Wb	Organic		O	0	CWHdm	12	80	7	20			7-(6)/D
15	Disturbed site																
16	90	7	Fl	Ev	Wb	Moder	8	SL	35	CWHdm	7	70	5	30			(4)5/D
17	999	0	Fl	Ev	Wb	Mull	2	SL	30	CWHdm	7	100					5-6/D-E
18	999	0	Fl	Ev	Wb	Moder	9	LS	35	CWHdm	7	100					6/E
19	999	0	Fl	Ev	Wb	Mor	11	SL	35	CWHdm	1	70	5	30			4/C-(D)
20	999	0	Fl	Ev(Hu)	Wb	Moder	5	SL	35	CWHdm	7	80	5	20			(4)-6/D
21	999	0	Fl	Ev(Hu)	Wb	Moder	4	SL	20	CWHdm	7	80	5	20			(4)-5/D
22	999	0	Fl	Ev	Wb	Moder	7	LS	30	CWHdm	7	100					5-6/D-E
23	999	0	Fl	Ev(Hu)	Wb	Moder	6	SL	30	CWHdm	7	90	5	10			(5)-6/D-E
24	999	0	Fl	Ev	Wb	Mor-Moder	9	SL	30	CWHdm	1	60	5	40			4/C-(D)
25	999	0	Fl	Ev	Wb	Moder	6	SL	40	CWHdm	7	70	5	30			(4)-5/D
26	999	0	Fl	Ev	Wb	Moder	9	SL	35	CWHdm	5	60	7	40			4-(5)/D
27	999	0	Fl	Ev	Wb	Moder	11	SL	35	CWHdm	7	80	5	20			5/D
28	999	0	Fl	Ev	Wb	Mor	9	SL	40	CWHdm	5	60	1	40			4/(C)-D
29	999	0	Fl	Ev(Hu)	Wb	Moder	10	LS	40	CWHdm	5	60	7	20	1	20	4-(5)/C-D
30	999	0	Fl	Ev	Wb	Mull	5	SL	30	CWHdm	7	100					6/E
31	999	0	Fl	Ev	Wb	Moder	5	SL	30	CWHdm	7	90	12	10			5-(7)/D

POLYGON	ASP	SL	SL_POS	PHYSIO	TERR_CLS	HUMUS	FF_DEPTH	SOIL_TXT	SOIL_CF	BGC_UNIT	SS1	SS1%	SS2	SS2%	SS3	SS3%	SMR_SNR
32	999	0	FI	Ev(Hu)	Wb	Mor-Moder	10	SL	40	CWHdm	5	80	1	20			4/(C)-D
33	999	0	FI	Ev(Hu)	Wb	Mor	13	SL	45	CWHdm	1	90	5	10			4/C-(D)
34	999	0	FI	Ev	Wb	Mor-Moder	9	SL	30	CWHdm	1	60	5	30	7	10	4-(5)/C-D
35	999	0	FI	Ev(Hu)	Wb	Moder	5	SL	25	CWHdm	5	70	7	30			4(5)/D
36	999	0	FI	Ev(Hu)	Wb	Moder	6	SL(SCL)	25	CWHdm	7	90	12	10			6-(7)/D
37	999	0	FI	Ev	Wb	Moder	4	SL	20	CWHdm	7	100					5/D
38	999	0	FI	Ev(Hu)	Wb	Moder	6	SL	20	CWHdm	7	60	5	30	12	10	4-6(7)/D
39	999	0	FI	Ev	Wb	Moder	6	LS	10	CWHdm	7	70	5	20	12	10	5-6(7)/D
40	270	8	FI	Ev	Wb	Moder	6	SL	30	CWHdm	5	70	1	20	7	10	4-(5)/(C)
41	999	0	FI	Ev	Wb	Moder	3	SL	30	CWHdm	7	80	5	10	12	10	(4)5-6(7)
42	999	0	FI	Ev	Wb	Mor	15	SL	15	CWHdm	1	60	5	30	7	10	4-(5)/C-D
43	999	0	FI	Ev	Wb	Moder	7	SL	30	CWHdm	7	70	5	30			(4)-6/D
44	999	0	FI	Ev	Wb	Moder	8	L	0	CWHdm	7	90	12	10			6-(7)/D-E
45	999	0	FI	Ev	Wb	Moder	6	SiL	5	CWHdm	5	70	7	30			4-(5)/D
46	999	0	FI	Ev	Wb	Mor-Moder	8	L	30	CWHdm	7	60	5	30	12	10	4-6(7)/D
47	999	0	FI	Ev	Wb	Mor-Moder	9	L	20	CWHdm	5	80	7	20			4(5)/D
48	999	0	FI	Ev(Hu)	Wb	Mor-Moder	9	SL	30	CWHdm	5	80	7	20			4-(5)/D
49	999	0	FI	Ev	Wb	Moder	6	SiL	15	CWHdm	7	80	5	10	12	10	(4)-5/D
50	999	0	FI	Ev	Wb	Mor-Moder	4	L	15	CWHdm	5	100					4/D
51	999	0	FI	Ev	Wb	Moder	9	SL	30	CWHdm	5	90	7	10			4-(5)/D
52	999	0	FI	Ev	Wb	Moder	9	SL	30	CWHdm	5	100					4/D
53	999	0	FI	Ev	Wb	Moder	9	SL	30	CWHdm	7	100					5/D
54	999	0	FI	Ev	Wb	Moder	6	L	20	CWHdm	5	100					4/D
55	999	0	FI	Ev	Wb	Moder	8	SL	35	CWHdm	7	60	12	30	5	10	(4)5-7/D
56	999	0	FI	Ev	Wb	Moder	8	SL	30	CWHdm	7	100					6/D
57	999	0	FI	Hu	Wb	Moder	7	SL	20	CWHdm	7	60	12	30	5	10	(4)5-7/D
58	999	0	FI	Ev	Wb	Moder	5	L	15	CWHdm	5	70	7	30			4-(5)/D
59	999	0	FI	Ev	Wb	Moder	10	SL	20	CWHdm	7	100					6/D
60	999	0	FI	Ev	Wb	Moder	9	SL	30	CWHdm	7	70	5	30			(4)-5/D
61	999	0	FI	Ev	Wb	Mull	2	L	0	CWHdm	12	80	7	20			6-7/D
62	999	0	FI	Ev	Wb	Moder	7	SL	35	CWHdm	7	80	5	20			(4)-5/D
63	999	0	FI	Hu	Wb	Moder	5	L	20	CWHdm	5	90	7	10			4-(5)/D
64	999	0	FI	Ev	Wb	Moder	8	SiL	25	CWHdm	7	80	5	20			(4)-5/D
65	999	0	FI	Ev	Wb	Moder	6	SL	20	CWHdm	5	80	7	20			4-(6)/D

POLYGON	STR STG	DOM SPP1	DOM SP1%	DOM SP2	DOM SP2%	DOM SP3	DOM SP3%	DOM SP4	DOM SP4%	DOM SPH	DOM DBH	DOM HT	DOM AGE	CODOM SP1	CODOM SP1%	CODOM SP2	CODOM SP2%	CODOM SP3	CODOM SP3%	CODOM SP4	CODOM SP4%	CODOM SPH	CODOM DBH	CODOM HT
16	YF	Dr	70	Ep	20	Cw	10			300	40	28	39	Dr	50	Ep	30	Cw	20			200	32	36
17	PS	Dr	80	Act	20					100	29	26	32	Dr	100							300	25	24
18	YF	Act	100							100	49	35	49	Dr	40	Hw	20	Cw	20	Ep	20	150	44	28
19	YF	Fd	100							200	52	34	55	Fd	50	Hw	40	Ep	10			250	42	28
20	PS	Dr	70	Ep	20	Act	10			2200	7	11	13	Dr	50	Ep	30	Pr	20			1600	5	10
21	YF	Fd	100							100	55	35	55	Fd	40	Hw	30	Ep	30			200	46	30
22	YF	Ep	40	Dr	30	Mb	30			200	36	30	56	Ep	50	Dr	50					200	30	25
23	YF	Dr	50	Ep	30	Act	10	Mb	10	125	34	24	56	Ep	50	Dr	50					100	30	20
24	YF	Cw	100							50	70	28	70	Cw	100							300	55	25
25	YF	Fd	100							100	50	38	64	Hw	50	Dr	30	Ep	20			300	35	24
26	MF	Cw	60	Fd	30	S	10			200	75	37	96	Cw	60	Ep	20	Dr	20			200	60	30
27	YF	Ep	40	Dr	30	Fd	30			350	48	35	60	Ep	70	Fd	30					150	40	30
28	YF	Fd	100							300	49	33	51	Fd	80	Ep	10	Dr	10			200	40	30
29	YF	Fd	100							400	51	35	57	Fd	90	Dr	10					250	40	31
30	YF	Ep	70	Dr	30					300	29	24	45	Ep	100							100	25	20
31	YF	Ep	60	Dr	40					200	32	25	44	Dr	60	Ep	40					400	26	21
32	YF	Fd	100							200	44	32	57	Fd	100							300	38	29
33	YF	Pe	100			Hw				600	22	20	52	Pe	100							800	19	18
34	YF	Fd	100							150	50	32	45	Fd	90	Dr	10					300	45	29
35	YF	Ep	70	Fd	30					400	46	30	48	Ep	70	Dr	20	Cw	10			350	19	26
36	YF	Ep	60	Dr	20	Act	20			400	29	25	38	Ep	70	Dr	30					250	22	20
37	YF	Dr	70	Act	20	Fd	10			100	52	26	40	Dr	80	Ep	20					350	42	22
38	YF	Dr	40	Fd	20	Act	20	Ep	20	300	51	36	52	Dr	40	Ep	30	Hw	20	Cw	10	200	40	32
39	YF	Fd	90	Hw	10					150	42	35	50	Fd	70	Hw	20	Cw	10			300	37	32
40	YF	Fd	90	Hw	10					150	67	37	63	Fd	90	Hw	10	Cw	<5			100	40	31
41	YF	Act	60	Dr	40					200	45	28	48	Fd	30	Hw	20	Cw	20	Mb	20	150	40	25
42	YF	Hw	60	Fd	40					300	74	36	68	Hw	40	Cw	40	S	10	Ep	10	200	60	32
43	YF	Fd	100							50	70	35	68	Fd	40	Hw	30	Cw	30			500	55	31
44	YF	Fd	60	Hw	30	Cw	10			25	98	38	75	Dr	50	Act	20	Cw	20	Ep	10	500	30	25
45	YF	Fd	100							300	71	35	83	Fd	50	Hw	30	Cw	20			200	60	32
46	YF	Hw	30	Act	30	Fd	30	Act	10	200	70	35	64	Dr	40	Fd	30	Dr	20	Cw	10	300	40	28
47	YF	Fd	100	Act						300	63	37	68	Fd	80	Dr	20	Act	<5			100	50	33
48	YF	Hw	60	Cw	30	Fd	10			300	49	32	67	Cw	40	Ep	30	Hw	20	S	10	250	42	29
49	YF	Act	70	Cw	30					75	75	34	45	Cw	30	Ep	30	Mb	20	Dr	20	250	45	28

Table 16 cont. Ecological Inventory

POLYGON	INTSUP SP1	INTSUP SP1%	INTSUP SP2	INTSUP SP2%	INTSUP SP3	INTSUP SP3%	INTSUP SP4	INTSUP SP4%	INTSUP SPH	REGEN SP1	REGEN SP1%	REGEN SP2	REGEN SP2%	REGEN SPH	TOTAL SPH	LIVE CRN	CRN CVR	LDR FUEL	GRND FUEL	FUEL TYPE
1	Hw	60	Cw	40					50	Cw	100			50	700	35	75	2	2	C6
2	Hw	50	Ep	30	Pe	20			300	Cw	70	Hw	30	300	650	50	60	3	2	M2
3	Hw	60	Cw	40					100	Cw	100			250	500	50	50	3	2	M2
4	Cw	100							150	Cw	100			50	450	30	55	3	2	D1
5	Cw	90	Dr	10					200	Cw	100			300	550	45	60	3	2	M2
6	Cw	60	Dr	40					50						550	35	65	2	2	M2
7	Hw	60	Cw	40					50	Cw	100			50	375	35	55	2	3	D1
8	Cw	50	Dr	30	Hw	20			200	Cw	100			25	650	80	65	3	2	M2
9	Cw	90	Dr	10					200	Cw	100			300	550	45	60	3	2	M2
10	Cw	60	Hw	20	Dr	20			100	Cw	100			50	350	40	35	2	2	M2
11	Cw	100							50	Cw	100			25	325	40	50	2	2	M2
12	Cw	100							200	Hw	100			50	600	30	65	2	2	C6
13															0					O1b
14	Cw	70	Hw	30					100						600	65	45	3	3	D1
15															0					O1b
16	Cw	70	Hw	30					100						600	65	45	3	3	D1
17															400	35	70	2	2	D1
18	Mb	100							50						300	40	40	2	2	D1
19	Hw	50	Ep	30	Cw	20			100	Cw	50	Hw	50	150	550	30	70	2	3	C6
20	Hw	70	Fd	30					100	Hw	70	Cw	30	250	3900	35	85	4	2	D1
21	Hw	80	Ep	20					100					0	400					C6
22	Cw	50	Hw	50					25						425	40	70	3	2	D1
23	Cw	60	Hw	30	Dr	10			50	Cw	70	Hw	30	25	275	40	35	2	2	D1
24	Dr	70	Cw	30					100	Cw	100			200	450	80	75	3	1	M2
25	Cw	50	Hw	30	Dr	20	Fd	<5	200	Cw	100			25	600	30	60	3	2	M2
26	Cw	100							100						500	65	75	4	3	M2
27	Fd	40	Ep	30	Dr	30			50						550	45	75	3	2	M2
28	Cw	80	Dr	20					50						550	30	80	2	2	C6
29	Hw	100							25	Hw	100			25	675	25	75	2	3	C6
30	Ep	70	Fd	30					50						450	50	60	3	2	D1
31	Cw	100							50	Cw	100			25	650	20	40	2	2	D1
32	Hw	70	Cw	30					100	Cw	100			25	600	30	75	2	3	C6
33	Pe	100							100	Hw	100			100	1500	15	80	5	2	C4

POLYGON	INTSUP SP1	INTSUP SP1%	INTSUP SP2	INTSUP SP2%	INTSUP SP3	INTSUP SP3%	INTSUP SP4	INTSUP SP4%	INTSUP SPH	REGEN SP1	REGEN SP1%	REGEN SP2	REGEN SP2%	REGEN SPH	TOTAL SPH	LIVE CRN	CRN CVR	LDR FUEL	GRND FUEL	FUEL TYPE
34	Hw	100							50	Hw	100			50	500	20	70	2	2	C6
35	Ep	50	Hw	50					25						775	40	65	3	2	M2
36	Fd	70	Hw	30					100						750	40	55	3	3	D1
37	Cw	100							25					0	475	60	50	3	2	D1
38	Cw	100							50						550	40	75	3	2	M2
39	Hw	60	Cw	30	Dr	10			100	Hw	60	Cw	40	50	550	25	80	2	2	C6
40	Cw	70	Hw	30					100	Cw	100			25	350	20	80	2	3	C6
41	Cw	50	Ep	50					50	Cw	100			50	400	45	65	3	2	M2
42	Hw	50	Cw	50					100	Hw	60	Cw	40	100	600	30	80	3	2	M2
43	Hw	70	Cw	30					100	Cw	100			50	650	30	75	2	2	M2
44	Dr	60	Hw	40					200	Hw	60	Cw	40	50	725	50	60	2	3	M2
45	Hw	50	Cw	50					100	Cw	50	Hw	50	50	600	35	70	3	3	C6
46	Dr	50	Hw	30	Cw	20			200	Cw	100			50	700	35	55	2	3	M2
47	Fd	100							50	Hw	100			50	450	35	70	3	3	C6
48	Cw	100							100	Cw	100			150	650	40	70	4	3	M2
49	Cw	50	Ep	50					50						375	65	55	3	3	M2
50	Cw	100							50						650	40	70	3	3	M2
51	Cw	70	Ep	30					100	Hw	70	Cw	30	100	450	55	60	3	2	M2
52	Fd	80	Hw	10	Dr	10			50	Cw	100			25	350	35	65	2	2	C6
53															450	50	35	2	2	M2
54	Cw	100							50	Cw	70	Hw	30	50	500	40	60	2	3	M2
55	Cw	100							100	Cw	50	Hw	50	50	650	40	70	3	2	M2
56	Cw	100							200						750	40	80	2	3	M2
57	Cw	100							50	Cw	100			25	450	30	65	2	3	M2
58	Cw	100							100					0	500	70	70	3	3	M2
59									0					0	200	35	30	1	3	M2
60	Fd	80	Dr	20					100					0	400	40	70	2	2	C6
61	Dr	100							50						350	50	65			M2
62	Hw	70	Cw	30					100	Cw	50	Hw	50	50	600	30	70	2	2	C6
63	Fd	100							50	Hw	100			25	650	30	75	2	3	C6
64	Dr	100							50	Hw	100			25	425	40	65	3	2	M2
65	Cw	90	Hw	10					50	Cw	90	Hw	10	75	250	30	40	2	4	S2
66	Fd	100							100					0	600	40	70	2	2	C6
67	Fd	50	Cw	50					50	Hw	50	Cw	50	50	650	30	70	2	3	C6

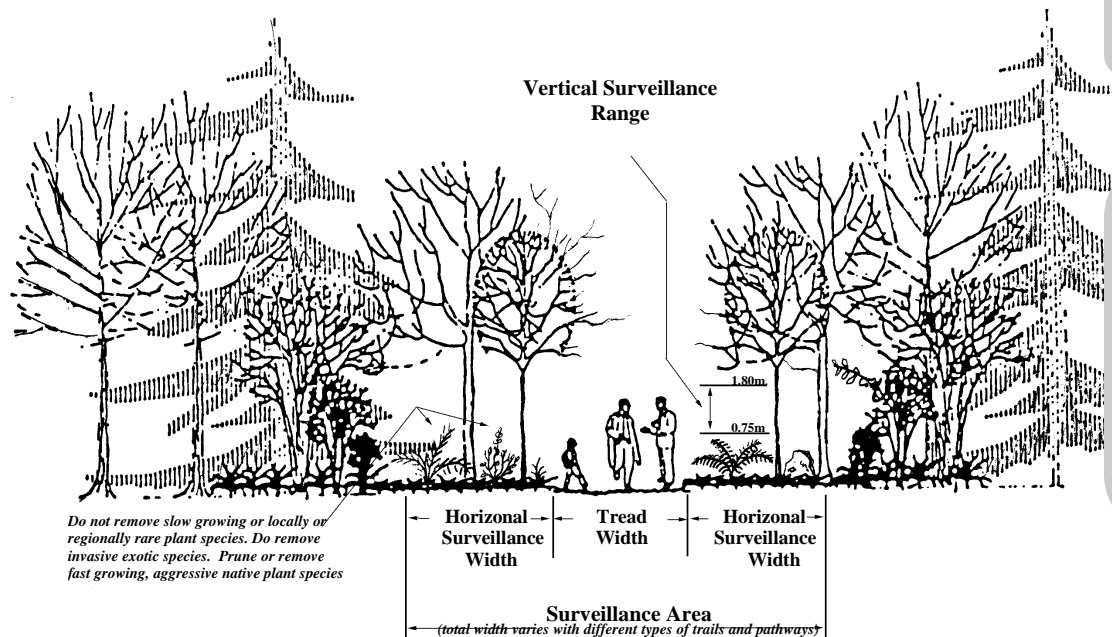
Appendix B Natural Area Trail and Pathway Specifications

Table 17 Natural Area Trail and Pathway Specifications

Trail	UNIVERSAL ACCESS / BARRIER FREE TRAIL	GENERAL ACCESS AND RECREATION TRAIL	RECREATIONAL NATURE TRAIL	PATHWAY	EQUESTRIAN TRAIL	MULTI-USE PATHWAY (AS PER ENGINEERING STANDARDS)	NATURE TRAIL	OFF ROAD BICYCLE TRAIL	UNSANCTIONED TRAIL	CLOSED TRAIL
Trail Type CODE	1	2	3	4	5	6	7	8	9	10
PURPOSE	Unimpeded, relatively safe access for users of varying physical abilities. For transportation and low impact or passive recreational activities	Multi-access and medium and low impact recreational uses. Connective travel corridors. i.e. school-forest-residential area	Exploration, discovery and recreation based foot traffic and slow off-road bicycling.	Designed to bear weight of larger vehicles for service or emergency access to a site. Other uses are accommodated.	Horseback riding, other uses possible but not encouraged.	Designed to accommodate mass alternative transportation. Refer to Urban Systems Document re: Multi-use Pathway Standards	Urban hiking, solitude, nature interpretation	Technical, off-road bicycling. Not recommended for pedestrians	Used for purposes that are inconsistent or contradictory to site objectives.	Closed due to negative environmental impacts or conflict with sanctioned uses
INTENDED USAGE RATE	Low-High Double Track or Single with pullouts	Medium-High 2-way traffic	Low-Medium Double or Single Track	Low-High (location dependant)	Medium-High (demand based)	Medium-High	Low Single track	Medium-High Single track- unidirectional Double track-bi-directional	Variable: If very high for legitimate uses, consider formalizing.	None
TREAD WIDTH	1.5m-2.5m	1.5m.-2.5m.	1.0m.-1.5m.	2.5m-4.0m.	0.5m.-2.5m.	3.0m-4.0m	0.5m.-1.0m.	0.3m.-1.2m.	Variable	None
SURVEILLANCE AREA WIDTHS (WIDTH EACH SIDE OF TRAIL)	1.0m-4.0m. each side	1.0m.-4.0m. each side	1.0m-2.0m. each side	Line of sight maintained Obstructions cleared. 1.0m.-4.0m each side	Line of sight maintained Surveillance area provided (x). Tread width +2x = min 2.5m	1.0m.-2.0m. each side	None provided Line of sight maintained	0.5m-2.0m each side. Line of sight maintained Handle-bar clearance maintained.	Not applicable	Green-up encouraged. Physical barriers maintained.
SURVEILLANCE AREA VERTICAL RANGES (ABOVE TREAD SURFACE)	clear between 0.75m.-1.8m.	clear between 0.75m.-1.8m.	clear between 0.75m.-1.8m.	clear between 0.75m.-1.8m. on demand	on demand, as required for safety	clear between 0.75m.-1.8m.	to maintain line of sight only	clear between 0.75m.-1.8m.	Not applicable	Not applicable
SURFACE TYPE	Crushed rock, Wood shreds, Concrete, Asphalt No bumps, dips or other obstructions greater than 2cm.	Crushed rock, Wood shreds, bark mulch.	Crushed rock, Wood shreds, bark mulch, native mineral soils.	Compacted crushed rock, soil cement, asphalt, concrete	Crushed rock, wood shreds, bark mulch.	Asphalt, concrete, compacted crushed rock.	Crushed rock, Wood shreds, bark mulch, native mineral soils, log corduroy.	Crushed rock, Wood shreds, bark mulch, native mineral soils, log corduroy.	Native soils or log corduroy, planks and plywood	Coarse woody debris, rocks, native plants / trees/ grasses, native soils.

Trail	UNIVERSAL ACCESS / BARRIER FREE TRAIL	GENERAL ACCESS AND RECREATION TRAIL	RECREATIONAL NATURE TRAIL	PATHWAY	EQUESTRIAN TRAIL	MULTI-USE PATHWAY (AS PER ENGINEERING STANDARDS)	NATURE TRAIL	OFF ROAD BICYCLE TRAIL	UNSANCTIONED TRAIL	CLOSED TRAIL
SUBGRADE (AS REQUIRED)	Crushed rock, Rip-rap, geotextiles, geo grids	Crushed rock, Rip-rap, geotextiles.	Crushed rock, Rip-rap, geotextiles	Road mulch, rip-rap, geotex., geogrids	Crushed rock, Rip-rap, geotextiles, geo grids.	Road mulch, rip-rap, geotex., geogrids	Crushed rock, Rip-rap, geotextiles, logs	Crushed rock, Rip-rap, geotextiles, logs	Not applicable	Not applicable
PREFERRED GRADE	0%-3% preferred 8%<4m. max. >5%= handrails >10%=steps	8%:max. <5%=preferred	0%-8% average 10% maximum	3%: sustained 5%: 30m. or less 10%: 15m. or less	0%-10% variable up to 15% for <25m.	3%: sustained 5%: 30m. or less 10%: 15m. or less	0%-10% variable up to 15% for <25m.	10%-15% max. sust. 15%-25% maximum	Not applicable	Not applicable
OVERHEAD VEGETATION CLEARANCE	2.5m. above tread surface	2.5m. above tread surface	2.5m. above tread surface.	3.0m. above tread surface	3.0m. above tread surface.	2.5m.-3.0m. above tread surface	Obstructions only to 2.4m. above tread surface	2.75m.-3.0m. above tread surface.	Not applicable	Favour "chest high" barriers.
ADDITIONAL FEATURES (SITE AND DEMAND DEPENDANT)	Wheel-stops, pullouts, boardwalks, bridges, ramps, benches, garbage receptacles, maps, signs	Boardwalks, stairs, bridges, benches, garbage receptacles, maps, signs	Only as needed	Not applicable	Tethering sites, pullouts, manure disposal area, bridges.	Wheel-stops, pullouts, boardwalks, bridges, ramps, benches, garbage receptacles, maps, signs, bike racks	Only as needed	Technical challenge features, safety rails, wheel stops, pullouts, bike racks, maps, signs, bike wash areas.	Remove all forts, tree houses, plank bridges, raw log tread, garbage, yardwaste, fire pits, makeshift benches, etc	Closure signs, fabricated barriers, gates.
COMMENTS	Build according to local demand. Limited applications. Highest maintenance standards	Use sparingly in sensitive natural areas. Maintain to high standards.	Utilize in more sensitive natural sites. Medium maintenance standards.	Use only when service / emergency access to a given area is absolutely necessary	Utilize when local public demand dictates. Maintain to high standards. Utilize professionals to design	Do not use in forests or near trees. Do not use in sensitive sites. To be utilized as a part of the Greenways system.	Maintain to avoid wet spots and vegetation encroachment	Utilize when local public demand dictates. Maintain to high standards. Utilize professionals to design	To be closed and deactivated upon detection in sensitive sites. Formalize trails if heavily used and appropriate for the site.	Should be checked and maintained in a deactivated state for 2 years. Closure should be enforced when needed

Natural Areas Trails and Pathways Surveillance Areas and Overhead Vegetation Clearances



Overhead Vegetation Clearance Height: All trees and large shrubs to be lift pruned or tipped back to the specified height **above** the tread surface.

Surveillance Area: the trail surveillance area has two dimensions, horizontal and vertical.

Horizontal Surveillance Width: the distance from the trail tread edge, into the adjacent natural area, where vegetation is selectively managed for security purposes.

Vertical Surveillance Range: the elevation span, above the trails' tread surface where vegetation, except tree trunks, is selectively removed.

Note that these guidelines should be used as such. Flexibility in design and construction must be employed to minimize any potential safety or security issues and to minimize any environmental impacts.

Appendix C Summary of Public Questionnaire

The following questions were asked to local residences and people using the Forest. A total of 100 questionnaires were filled out and the answers have been summarised by percentage response.

1. How often do you visit Green Timbers Urban Forest? *

Very little (<1/month)	%10
Monthly (1-3/month)	%10
Weekly (1-2/week)	%55
Very often (>2/week)	%25

*Respondents were given these four choices

2. How did you get to the Forest? *

Parked a car at the main parking lot	%80
Walked here	%15
Biked here	%5
Other	%0

*Respondents were give these four choices

3. Where did you enter the Forest? *

At the main parking lot	%80
Trails off of 148 th Street	%10
Other trail entrances	%10

*Respondents were given these three choices

4. What area of the park do you visit most often? *

The Lake area only	%60
North of Fraser Highway	%35
S of Fraser highway	%0
All of the Forest	%5

*Respondents were to describe the areas they visit and point on a map

5. What recreational activities do you conduct in the Forest most often? *

Walking/hiking	%50
Dog walking	%20
Jogging	%12
Bike riding	%8
Fishing	%10
Other	%0

*Respondents were offered these six choices. Only one answer was accepted, as this activity was conducted more often than others were.

6. Have you had any conflicts or problems with other users of the park? *

None	% 70
With dogs	%15
With bikes	%10
With fishermen	%5

*Answers were categorised into these four headings.

- Problems with dogs were either that they were off-leash or that their waste was not picked up. Problems with bikers were that they were riding too fast along the trails and the problems with the fishermen were that they were leaving garbage along the lake, trampling the vegetation, taking too many fish and using illegal lures.

7. Are there any issues that you feel should be addressed within this management plan? *

No	%45
Work to minimise dog droppings in the Forest	%10
Place gravel on all of the trails	%5
There is too much garbage around the lake area	%25
Worried about car being broken into	%5
It is unsafe for women to walk in the trails	%5
Should have interpretative tours	%5

*This question was left open and responses were written down and totaled into this summary.

8. Do you agree with the current Trail Uses and their Standards of upkeep?*

Yes	%95
No	%5

*Respondents were to answer yes or no

Comments from respondents:

- Trails are too muddy
- Want more gravel for year round use

9. Do you think some user groups should be limited to the trails they use?*

No	%95
There should be some limits to bikers	%5

*This question was left open for the respondent to answer.

10. What would you like Parks and Recreation department to do to ensure that dog owners pick up after their dogs? Or is it not a big issue with you?*

Not a big issue	%50
Patrol the park more often	%10
Put in more garbage cans	%20
Provide bags for owners	%20

*This question was left open for the respondent to answer?

Comments from respondents included:

- Doesn't seem to be a problem from what I've seen
- Patrol the park and give out big fines
- Put in a dog station at the main entrance of the parking lot with bags and rules of conduct
- Have students patrol the park

Appendix D Contact List

In order to identify areas where current access and recreation needs were not being met at Green Timbers Urban Forest, it was necessary to conduct some interviews. Interviews by telephone or in person were made with groups and individuals using the Forest, with those wanting to be a part of its management or those that are affected by its management. In addition to the people interviewed below, one hundred and twenty people were interviewed in the Forest and in the surrounding neighborhoods. In general, there were few concerns regarding the Forest's access and recreation management. The majority was satisfied with the trail classifications, recreational opportunities, signage, facilities and maintenance found within the Forest.

Table 18 Contact table

Contact*	Group or cause they are representing	Comments
	White Rock Surrey Naturalists	Concerned about the increase in usage over time. Wanted to make sure that the integrity of the Forest was protected for future generations. The trails should try to concentrate use in certain areas while protecting sensitive habitat and ecology. Signage should be posted that encourages visitors to protect the Forest resource.
Wady Lehmann, Peter Maarsman	Green Timbers Heritage Society	Need to protect the ecological integrity of the park. Need to work on reducing the amount of fragmentation of the park caused by major roads. Need to set aside an area for non-consumptive use. Reduce the amount of sign pollution. Protect critical ecology and habitat. Work with various groups to educate visitors of the history, ecology and wildlife habitat of the Forest so that they will attempt to protect it in the future.
Matt Gooding	Dog Walking company (Good dog)	Rarely uses the Forest for dog walking because he cannot let the dogs off-leash. He has never had any problems with other user groups in the Forest. Would like to see some trails that permit dogs to be off-leash.
Shirley Sykes	BC Ministry of Forests (Arboretum, old nursery - adjacent to Green Timbers Urban Forest)	Does not have any input at this time. Happy to know that they were contacted about the plan, but the use of the land will likely be turning over to an educational facility in the near future.
Shawn Gurney	Surrey Parks	Will use ecological mapping to prescribe suitable plant species to rehabilitate denuded areas.
Liz Walker	Western Canada Wilderness Committee	Concerned about the increase in usage over time. Wanted to make sure that the integrity of the Forest was protected for future generations. The trails should try to concentrate use in certain areas while protecting sensitive habitat and ecology. Signage should be posted that encourages visitors to protect the Forest resource.
Ian Maclean	Surrey Cycling Coalition	Trails are wide enough and in general well maintained. Some users would like to see a variety of

		trail uses within the Forest. Some people are using the Forest as part of their commute to and from work.
Dale Denny	Green Timbers Community Society and Surrey Fish and Game Club	Concerned about off trail use near King Creek- damage to riparian areas, trampling vegetation – it is affecting the water quality. Fishing concerns - illegal use of bait and lures, people over catching the limit, need to continue stocking the lake, people trampling the vegetation lakeside. Does want Forest to become a sports complex, should be used to appreciate the environment.
Malcolm Jorgenson, Simon Cunningham	School District #36	Would like to get more schools and kids involved with the Forest. Many educational opportunities for kids at the Forest. Many teachers would welcome the opportunity to have guided tours. Could also end up helping the UFES department in recruiting park wardens for the future.
Annie Mckitrick	Surrey Social Futures	Little input at this time. The Forest provides good educational opportunities.
Jean Lamontagne, Tiina Mack	Parks planning	Small changes to the Greenways plan were made so that it does not travel through the northern portion of the Forest (north of 100 th Ave) No changes to trail classifications are needed at this time. Once the Greenways plan is implemented, safe crossings across the main arterial roads will be installed. A copy of the report will be made available to this department.
Bill Coutts	BC Hydro	Discussed maintenance schedules of small grass edge to paved walkway. Had no other comments regarding the plan.
Kevin Beenham	Fire Hall 6	Discussed fire risk and abatement procedures. Will review the fire plan and provide feedback. Interested in the access and recreation aspect of the plan because he is involved with the changing of the BC MOF site to an educational facility. Will be asking a member of UFES for a copy of the plan.
Stacy Yeates	Surrey Leisure Services	Discussed various events that take place within Green Timbers Urban Forest.
Sonya Boston	Park permits in the City of Surrey	Discussed the permitting process for Surrey Parks. Rarely do they have large events in their parks. Permits are required to conduct events in their parks and are not given if they show undue impact to the park environment or the facilities provided within it.
Lanny Englund	UFES City of Surrey	Numerous events within the Forest but largest is the Teddy Bear Picnic. Up to 1000 people over a weekend. Need to prevent degradation of meadow by concentrating people along trails.
Greg Ward, Shawn Gurney,	UFES City of Surrey	Regarding the urban forest, discussed: trail maintenance standards, vandalism, facility requirements, urban forest policy, natural area policy, risk management, signage requirements, user conflicts, recreational needs, fire hazard and risk abatement, dog bylaws, dog parks, staff requirements, state of co-operation/liaison with other groups and departments, biodiversity in the lower mainland, critical ecology, future demands, fragmentation of the Forest by roads, providing an area set aside for non-consumptive use.

*This contact table displays only the essential issues discussed in each interview.

GREEN TIMBERS ADVISORY COMMITTEE
NAME
Don Knight
Dale Denney
Don McLean
Malcolm Jorgenson
Wady Lehmann
Peter Maarsman
Rene Savenye
Bela Sivak
Liz Walker
Greg Ward
Wayne Sakamoto
Shawn Gurney