City of Surrey
Parks, Recreation and Culture Department

SUNNYSIDE ACRES URBAN FOREST

FIRE MANAGEMENT PLAN

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FIRE MANAGEMENT PLAN

EXECUTIVE SUMMARY

The overriding goal of the Sunnyside Acres Fire Management Plan is to protect people, habitat and wildlife through the prevention and timely suppression of fire using ecologically sensitive means. The Plan has been developed in response to a growing and increasing risk of *human-caused* fires in Sunnyside Acres Urban Forest. A Sunnyside-specific fire plan has long been recognized as necessary to ensure management activities are in place to address the threat of fire to the Forest. The Sunnyside Acres Urban Forest Advisory Committee identified the development of a fire management plan for the Forest as a high priority in 2000.

A sub-committee of the Advisory Committee guided the development of the Plan. Two members of the Advisory Committee, Chairperson Dr. Roy Strang and Diana Wegner, were instrumental in the development of the Plan. Kevin Beenham, Captain: Training, Surrey Fire Department, provided much needed input to the development of the fire suppression section of the Plan.

The Plan is based on management principles that ensure a balanced approach that values both human needs and ecosystem protection. The Forest was created and protected in Parks, Recreation and Culture Policy to be 'set aside in perpetuity for their intrinsic and heritage values, to provide long-term non-consumptive enjoyment and benefits for the general public'. The Plan respects this Policy.

The main thrust of the Plan is articulated through the creation of five major fire management zones within the Forest. In developing the Plan the Wildfire Hazard Rating System (WHRS) was employed. The system quantifiably measures four key components of fire behaviour, risk of ignition, structures at risk, and suppression constraints. Wildfire hazards rating were identified for the zones and two zones are rated as high-extreme, one zone low-high, and two zones as low-moderate. Each management zone has specific and priorized recommendations to manage the hazards associated with the risk of fire.

The Plan also makes general recommendations for fire prevention, detection, rehabilitation and mitigation, and discusses corporate approaches to fire suppression in the Forest.

The implementation of the Plan is the responsibility of the Parks Division, Urban Forestry and Environmental Services Section. The recommendations within the Plan will be integrated into the annual work plans of this Section.

I. INTRODUCTION:

SUNNYSIDE ACRES: AN URBAN/WILDLAND INTERFACE AREA

1. THE NEED FOR A PLAN

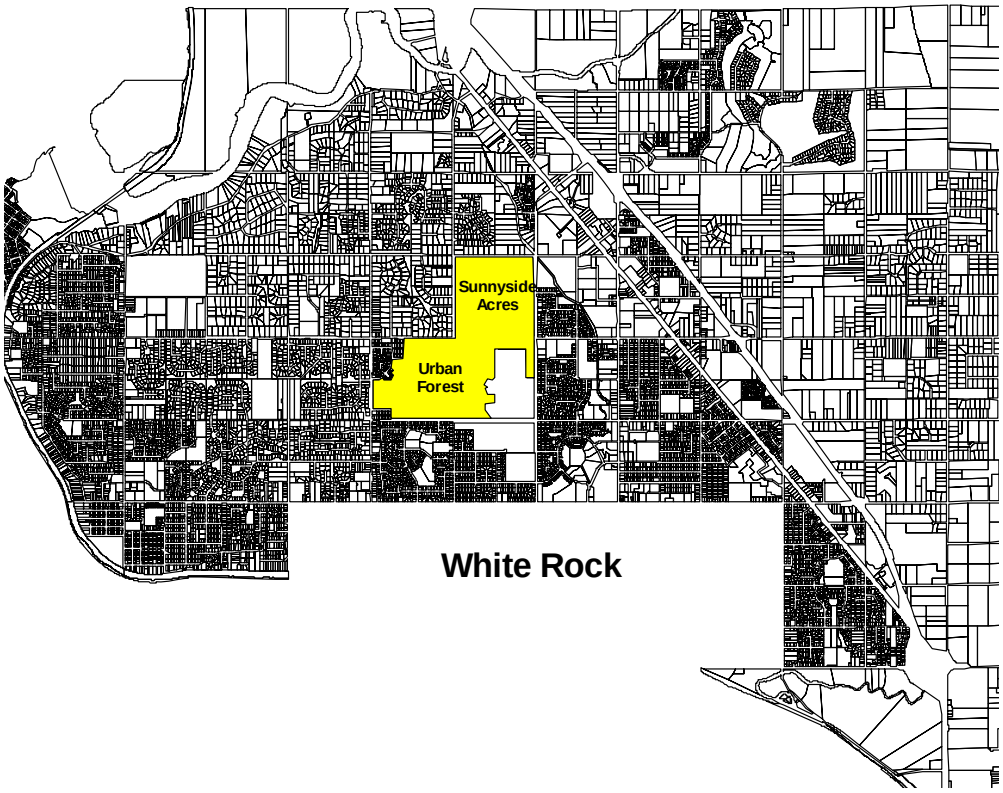
A growing population and increasing risk of *human-caused* ignition make effective fire management a serious concern and goal for the protection of Sunnyside Acres. The unique nature of the Acres as a designated Urban Forest and rare ecosystem on the urban interface calls for a fire management plan with specific adaptations.

Recent changes in fire suppression responsibility have made the need for a Sunnyside plan even more critical. Until 1998, an Memo of Understanding (MOU) of 1993 "assured the Fire Department and the City that the City's forested parks would be adequately protected" through the cooperative efforts of the City of Surrey and the Chilliwack Forest District, "with Ministry of Forests being the lead agency and City providing support services." However, in 1998 the MOF issued "Operating Guideline #1.06.01 Wildland Suppression and Local Government"
which replaced the previous MOU. According to Chief J.G. Bale, the new operating guideline "place[s] the responsibility for suppression of fires within the City's forested parks with the City" such that "the one hour control or extinguishment criteria established under the MOU no longer applied." The Guideline "identifies the key element between the MOF and a local fire department as one of `mutual aid' with the City being the lead agency and the MOF providing support services" (see Appendix 1: letter from Fire Chief J.G. Bale to Roy Strang, Aug. 10/99). This change in responsibility is reflected in the Sunnyside Acres fire management plan, specifically where suppression is concerned.

The Sunnyside fire plan is also well synchronized with provincial initiatives. The Auditor General's audit of interface fire risk management, carried out by the province between December 1999 and July 2000, indicates serious inadequacies throughout the province—many of which the City of Surrey has already addressed or is in the process of addressing. The "2001/02 Report: Managing Interface Fire Risks" states that "fire and emergency experts believe that interface fire prevention work has been insufficient in many communities with high or moderate risks" (p.6) and cites costs and losses associated with personal injury, business interruption, destroyed historical sites, destroyed wildlife and habitat, and lost tourism opportunities (p. 4). The Sunnyside Acres fire plan has considered these risks and will make the City of Surrey a leader among municipalities in its initiatives towards interface fire management.

To a great degree, this plan has been influenced by the general fire plan for Surrey's natural areas. The City has developed a formal *Natural Areas Fire Management Strategy* that provides a framework for site-specific plans.

Map 1: Sunnyside Acres (small scale location)



2. PURPOSE AND SCOPE

The primary focus of fire management planning in Sunnyside Acres is on the prevention, detection, and suppression of *human-caused* fires. More specifically, all strategies involved in the fire management of Sunnyside Acres must address the special designation of the Acres as an Urban Forest and should therefore minimize any ecological damage to the forest.

A mountain bike park located in a park forest immediately adjacent to the Urban Forest is included in the fire management plan because of its impact on the Forest. There are two important implications of the proximity of the bike park to the Forest:

1) The designation differences between the bike park forest and the Urban Forest indicate different strategies for fire management: while the forest must be approached as an ecologically sensitive natural area, more ecological intervention can be tolerated in the bike park forest. As a high use area, the bike park is also a high fire risk area.

2) However, the adjacency of the bike park to the Forest indicates the necessity of fire management activities in the bike park that are sensitive to the ecological values of the forest. (See Map 2.)

3. DIVISION OF RESPONSIBILTIES

As the land manager, the Parks, Recreation and Culture Department is responsible for all aspects of Fire Management in natural areas except suppression. Fire suppression in Sunnyside Acres and all other natural area parks, is the responsibility of the City of Surrey Fire Department. This normally includes initial attack, suppression, and mop-up of all fires. All suppression efforts within the Surrey Fire Department are in cooperation with the Ministry of Forests, Provincial Forest Protection Branch, following Operating Guideline #1.06.01, Wildland Suppression and Local Government and specifically as stipulated in the operating guideline, #2.17.13, Fire Suppression Wildland/Urban Interface, developed between the City and Ministry of Forests.

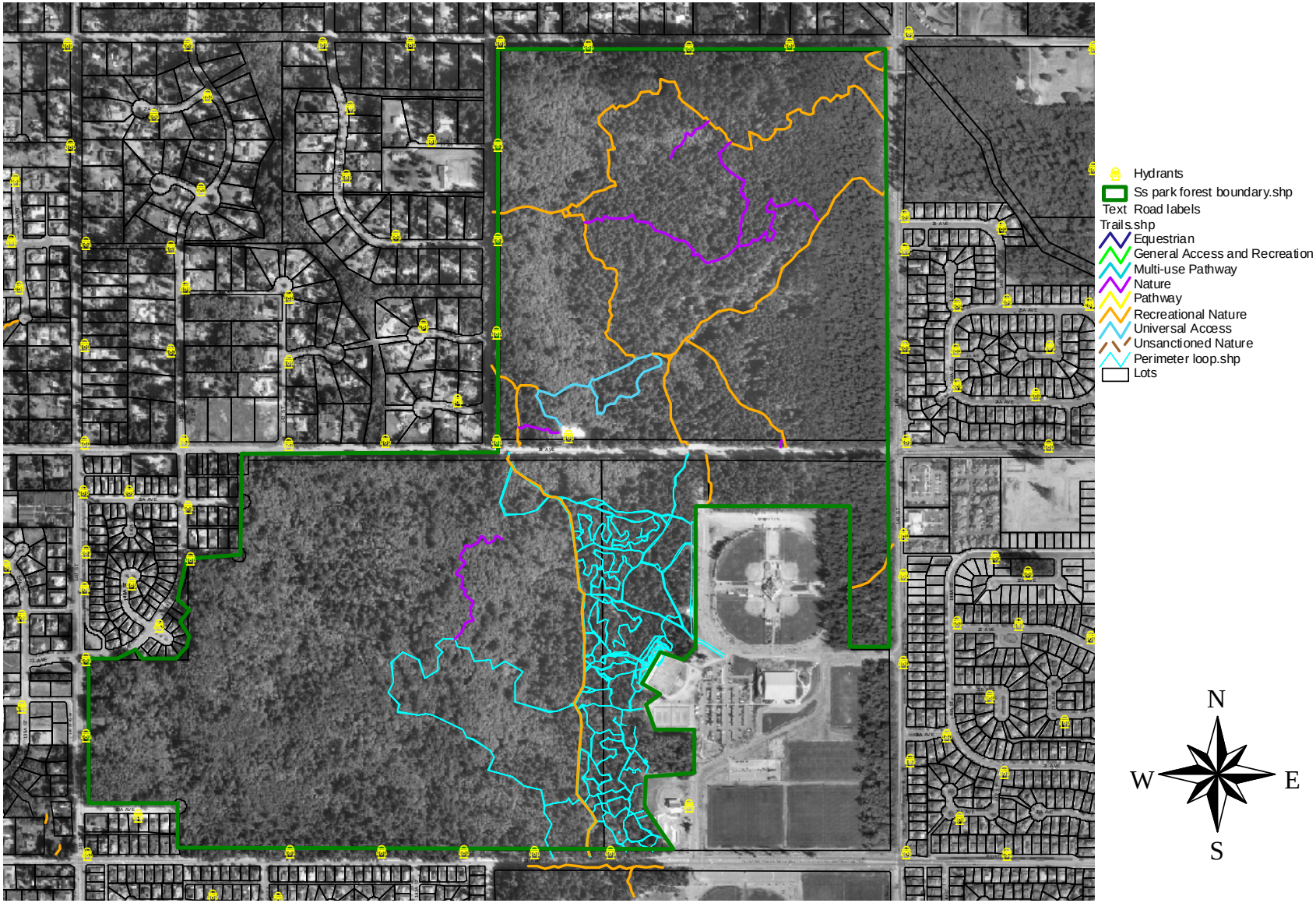
4. SUNNYSIDE FIRE HISTORY

The City's *Strategic Fire Management Plan* for natural areas takes into consideration its overall climate which is described as the biogeoclimatic Coastal Douglas-fir (CDF—which is designated "rare") and Coastal Western Hemlock (CWH) zones. The natural fire regime within these zones is characterized by long return interval crown fires and occasional surface fires in combination (100- to 300 year return intervals). Sunnyside Acres Urban Forest is at the wet extremity of the moist maritime subzone (CDFmm) of the CDF or, at the transition to the very dry maritime coastal western hemlock subzone (CWHxm) (Klinka, 2001). (See Appendices 2, 3 and 4 for climatic and rainfall data.)

In the past, fires have occurred in Sunnyside. Charcoal and charred logs and stumps are evident throughout the Forest indicating that fire has been widespread but it is unclear how much burning was due to lightning and how much to human activity. Anecdotal evidence suggests that small, local fires were likely common from the time of logging (between 1880 and the early 1900s), and that the last known fire burned in 1929. Fire scars on one old Douglas-fir tree conform to this timing, and may indicate a slash burning.

Although there have been no recorded large-scale fires within Sunnyside Acres over the last 70 years, a number of intentional or accidental fire incidents have occurred recently and could have resulted in large-scale fires. Of greatest concern is the large percentage of fires which are deliberately set in close proximity to facilities and structures adjacent to or within the Urban Forest. These types of fire

pose the greatest risk to property and public safety and are considered the most difficult to control. In the past three years at least six bonfires have burned. The evidence of discarded beer cans and other debris left at the sites suggests these were probably lit by party-goers. One fire was set deliberately as an act of vandalism to destroy trail marker posts and signs.



Map 2: Sunnyside Acres and Sunnyside Athletic Forest: trails, access points, perimeter fire hydrants, and forest types.

II. SUNNYSIDE ACRES FIRE MANAGEMENT PROGRAM

The Sunnyside Plan outlines management principles, goals and objectives designed to minimize the hazard and risk of uncontrolled natural and human-caused fires in the urban forest. The following describes the key activities of the Sunnyside Acres Fire Management Program and should be implemented as part of the Parks, Recreation and Culture Department's annual work plan for managing park natural areas.

1. PRINCIPLES

The Sunnyside Acres fire management plan is based on management principles developed to ensure a balanced approach that values both human needs and ecosystem protection. The informing management principles are to:

- preserve and protect the integrity of natural area ecosystems
- protect human life and private property
- comply with other existing policies affecting the management of Surrey's natural areas

2. GOALS AND OBJECTIVES

The primary goal is to protect people, habitat, and wildlife, through the prevention and timely suppression of fire using ecologically sensitive means.

The primary objectives of Sunnyside's Fire Management Plan are to:

- ensure the long-term conservation of the Forest and its inhabitants
- minimize the risk of ignition and fire damage to persons and property
- minimize the City's associated potential liabilities
- control potential fire behaviour utilizing accepted hazard reduction techniques
- ensure a high level of preparedness through community prevention and detection programs
- ensure that fire suppression activities are compatible with the natural area management principles, themes, goals and objectives as outlined in the *Overview of Natural Area Management Plan: Strategic Directions*
- ensure that post-fire rehabilitation is conducted promptly and appropriately from both an ecological and environmental perspective

3. GENERAL RECOMMENDATIONS

The following list previews the recommendations in general:

- Assess, prevent, and reduce/manage fire hazard risk in Sunnyside Acres Urban Forest.

- Minimize potential fire severity utilizing accepted hazard reduction techniques for fuel management.

- Restore ecosystem structure and function, after a fire, through rehabilitation and mitigation of fire effects, in accordance with the constraints posed by the environmentally sensitive features of the Forest..

- Foster public education on the negative impacts of fire on the urban/interface. These educational initiatives should be conducted as a cooperative effort between the City of Surrey, BC Parks, and the Surrey Fire Department. Initiatives should include the following:

- Organize annual basic fire suppression training for park staff working in the park.

- Once the fire danger rating reaches extreme, stop all work with motorized machinery in the park and within 20 metres adjacent to the park. This includes activities such as grass cutting, brushing, trail building and maintenance.

- Develop, maintain, and annually update a fire history and environment data-base. The database needs to include a number of retrievable attributes. From a vegetation management and public safety point of view the most important attributes are as follows:

  i) the cause (if known)
  ii) location
  iii) date and time of day
  iv) the site association and successional stage (fuel type)
  v) the area burned
  vi) the Canadian Forest Fire Weather Index (FWI) System codes and indexes
  vii) control/suppression tactics and results
  viii) interval between fire report and initiation of suppression
  ix) type of fire: ground or crown
  x) structural damage resulting

- Enlist community volunteers for training in fire hazard reduction and for patrolling and reporting on fire behaviour in the forest.

- Collect and disseminate all information on fire behaviour and related activities, including patrolling activities, and make it accessible to all parties. Ensure a mechanism for two-way communication between the Department of Parks, Recreation and Culture and the Surrey Fire Department.

- Upgrade maps regularly.

4. DEFINITIONS

For the purpose of the plan the following definitions apply:

Fire Risk: (1) a measure of the expected severity (e.g. how many deaths, injuries, dollars or damage per fire) for all fires or a particular type of fire,
(2) a measure of the probability of occurrence of all fires or that of a particular type of fire,
(3) an analysis of potential factors (e.g. human or natural) which can contribute to the potential for fire occurrence.

Fire Hazard: a fuel complex defined by volume, type, condition, arrangement, and location, that determines the degree both of ease of ignition and of fire suppression difficulty.

5. ASSESSMENT: WILDFIRE HAZARD RATING FOR SUNNYSIDE ACRES URBAN FOREST

A. OVERVIEW OF WILDFIRE HAZARD IN SUNNYSIDE ACRES

To incorporate the various factors contributing to the risk from wildfire and to identify high, medium, and low hazard areas, a global information system (GIS) model was used. This assessment provided a platform from which to develop and prioritize detailed prescriptions for minimizing these hazards. The model documents potential fire behavior characteristics, ignition sources, constraints on suppression resources and structures at risk from a wildfire.

Most structures surrounding Sunnyside are separated by a fuel-free buffer. The north, west and south boundaries of the Urban Forest adjoin two-lane paved roadways—28th Avenue, 140th Street, and 20th Avenue respectively—while the eastern edge is bounded by a four-lane boulevard, 148th Street. The housing development at 24th Ave and 140th Street is the only area where the forest abuts directly on to homes and yards. The forest immediately adjacent to this development contains a mix of flammable conifers and fire resistant hardwoods. A wildfire in this stand would pose a threat to the adjacent housing but would not likely spread far into the adjacent fire resistant hardwood forests located to the east and south.

Between 24th Avenue, which bisects the Forest in a east/west direction, and 20th Avenue (the southern boundary), the Forest adjoins a mountain bike park which is part of the South Surrey Athletic Park complex. This Park is frequented by youths and teenagers, particularly in the south-east corner towards 20th Avenue in the vicinity of the skateboard park and youth facility. The forest in this area is dominated by a closed stand of mature Douglas-fir trees which poses a high risk of a crown fire. In such areas of this hazardous fuel type, careless activities (usually involving teenagers who may be partying, drinking, smoking and lighting bonfires) make this the highest risk area in the park.

At the time of preparation of this Plan (Fall 2001), some 11 hectares of the mature Douglas-fir are infected with a root rot disease which is spreading radially at a rate of about 50 cm/year. Dead standing trees created by this disease act as ladder fuels which facilitate the movement of ground fires into the crowns of adjacent stands making these fires much more difficult to control. The disease attacks and decays the root systems of Douglas-fir eventually killing them and causing them to fall over. Initial defoliation, the early symptom of disease, contributes to an unusual build-up of needles and small branches on the ground and constitutes a significant load of fine fuels. With time (two to three years), the fallen needles decay and become much less flammable; however, they produce ladder fuels while standing with limbs. Later, these trees fall or drop large branches increasing the component of large fuels which is not readily ignited, but, once alight, burns steadily and is not easily extinguished. It is recommended that fuel accumulations adjacent to trails be minimized to reduce the chance of ignition from human activity in this area.

The following sections provide a detailed description of the hazard assessment methodology (Section B) and a detailed analysis of the fire hazard assessment for the five fire management zones in Sunnyside Acres Urban Forest (Section C).

B. METHODOLOGY

i) Wildfire Hazard Rating System (WHRS)

The "Wildfire Hazard Rating System" is a global information system (GIS) based model which spatially quantifies and analyses the relationships that exist between the critical factors affecting wildfire risk. The objective of this model is to provide park managers with a decision-making tool that spatially identifies the severity of wildfire hazard within a specified area. This information allows managers to analyse and explore the implications of different management activities in relation to wildfire risk.

The WHRS measures wildfire hazard by incorporating four key components:

1. Fire behaviour
2. Risk of ignition
3. Structures at risk
4. Suppression constraints

These four components are in turn calculated from a number of contributing factors, each of which is represented by a layer in a GIS environment. The wildfire hazard of each of the four components is calculated by overlaying the relevant contributing factors. The layers representing these four components are then overlaid to produce the final wildfire hazard rating

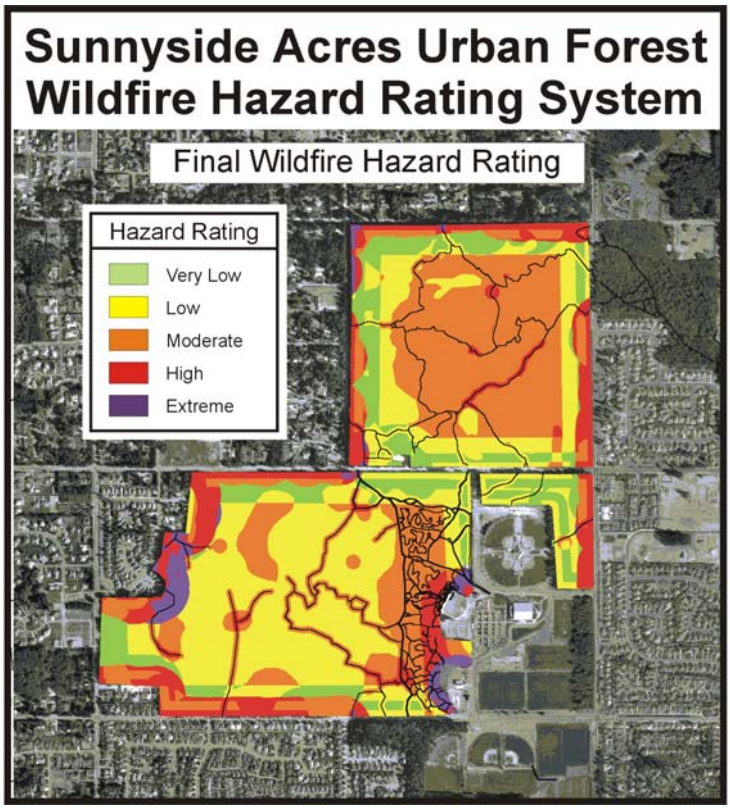
Each of the contributing factors has been designated a maximum possible weight that reflects each layer's relative importance and contribution towards the overall wildfire hazard. The weighting of the individual layers combine to a maximum of 25 points per component and 100 for the overall wildfire hazard. These numeric weightings are used to categorize the wildfire hazard as low, moderate, high and extreme.

The final wildfire hazard rating has been calculated by adding together the ratings of the four primary components. The final weightings are categorized as follows:

Final Wildfire Hazard Rating

Weight	Category
0-21	Very low
22-31	Low
32-41	Moderate
42-51	High
>51	Extreme

Map 3. Final Hazard Ratings



ii) Fire Behaviour

The fire behaviour component of the WHRS measures how a wildfire will behave under extreme weather conditions. The Canadian Fire Behaviour Prediction System is a model that provides quantitative outputs of fire behaviour characteristics for the major Canadian fuel types. Specific information pertaining to fuel types, topographical attributes, and fire weather has been analyzed in accordance with this model to calculate the following three output fire behaviour layers:

1. Fire Intensity. This layer is a measure of the rate of heat energy released per unit time per unit length of fire front. It is based on the rate of spread and the predicted fuel consumption. The units for this layer are kilowatts per metre (Kw/m).

2. Rate of Spread. This layer is a measure of the speed at which a fire extends its horizontal dimensions. It is based on the hourly Initial Spread Index (ISI) value and is adjusted for the steepness of slope, the interactions between the direction of

the slope and wind. The increasing fuel availability is accounted for through the Build Up Index (BUI). The units for this layer are metres per minute (M/min).

3. Crown Fraction Burned. This value is a measure of the proportion of the tree crowns involved in the fire. It is expressed as a percentage value and is based on the rate of spread , the crown base height and the foliar moisture content.

iii) Fuel Types.

Sixteen national benchmark fuel types, which are divided into five categories, are used by the Canadian Fire Behaviour Prediction System to forecast how a wildfire will react. Sunnyside Acres Urban Forest has been stratified into similar fuel types and categorized according to this system. Four main fuel types were identified in Sunnyside Acres:

Note: These fuel types represent a type of behaviour pattern. The names do not necessarily reflect the type of stand that is found.

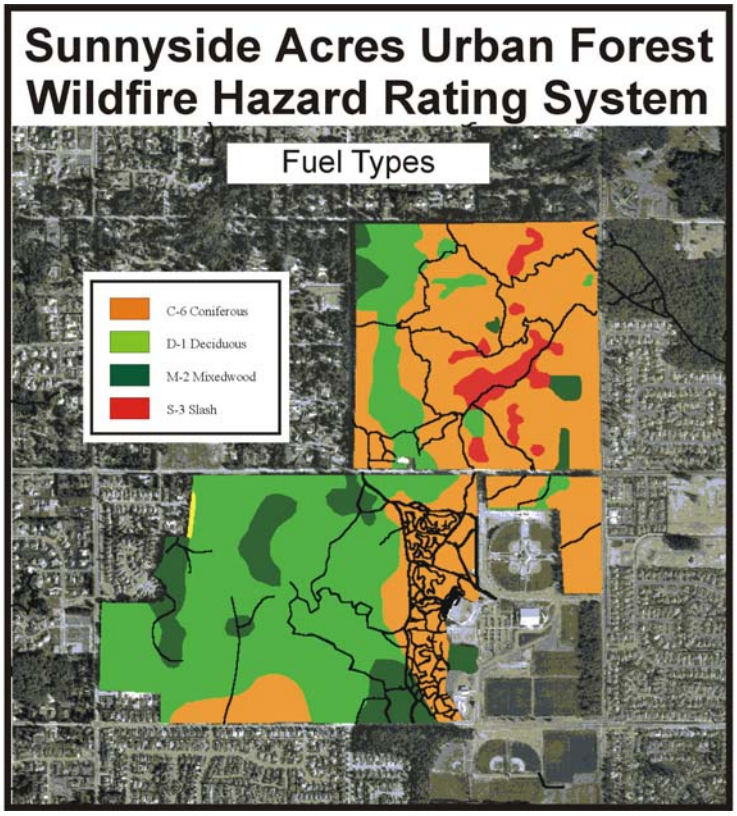
C-6 Coniferous : "Coniferous Plantation." This fuel type is characterized by stands dominated by mature Douglas-fir trees. The tree crowns are close together and are generally located greater than 5 metres above the forest floor. The bark of these trees is thick and resistant to fire although the crowns are flammable. This fire-resistant bark, combined with the low to moderate ladder fuels, reduces the chance of a ground fire spreading to the crowns. However, if this were to happen, the fire would spread readily and be difficult to control.

D-1 Deciduous: "Leafless Aspen." This fuel type is dominated by deciduous tree species. These trees are generally resistant to fire and are located in the wetter portions of Sunnyside Acres. Ground fuels are generally low in these areas. This fuel type poses the least hazard for wildfire.

M-2 Mixedwood : "Boreal mixedwood-green." This fuel type is characterized by stand mixtures of both coniferous and deciduous species. In Sunnyside Acres, these stands are composed of primarily Douglas-fir, western red cedar, red alder and big leaf maple. These stands contain enough of the flammable coniferous species to sustain and spread a wildfire. The stands are multistoried and as such contain the critical ladder fuels which will help move ground fires into the crowns of the stands.

S-3 Slash: "Coastal cedar-hemlock-Douglas-fir slash." In Sunnyside this fuel type is used to represent the heavy fuel accumulations found in the root rot centres. These areas contain heavy ground fuels as well as dead standing trees which act to spread a ground fire into the crowns of the adjacent stands.

Map 4. Fuel Types



iv) Weather Conditions

Weather conditions used to calculate these layers were derived from established Ministry of Forests weather stations nearest to Sunnyside Acres: the UBC research stations in Maple Ridge and on Saltspring Island. Historic records were compiled and statistically analyzed to determine the 90th percentile fire weather indices for each station. The fire weather indices required include: the fine fuel moisture code (FFMC), the build-up index (BUI) and wind speed. The cardinal wind direction was calculated was assumed to be upslope and the elapsed time was set at 24 hours.

The fire weather indices used for the fire behaviour calculations are:

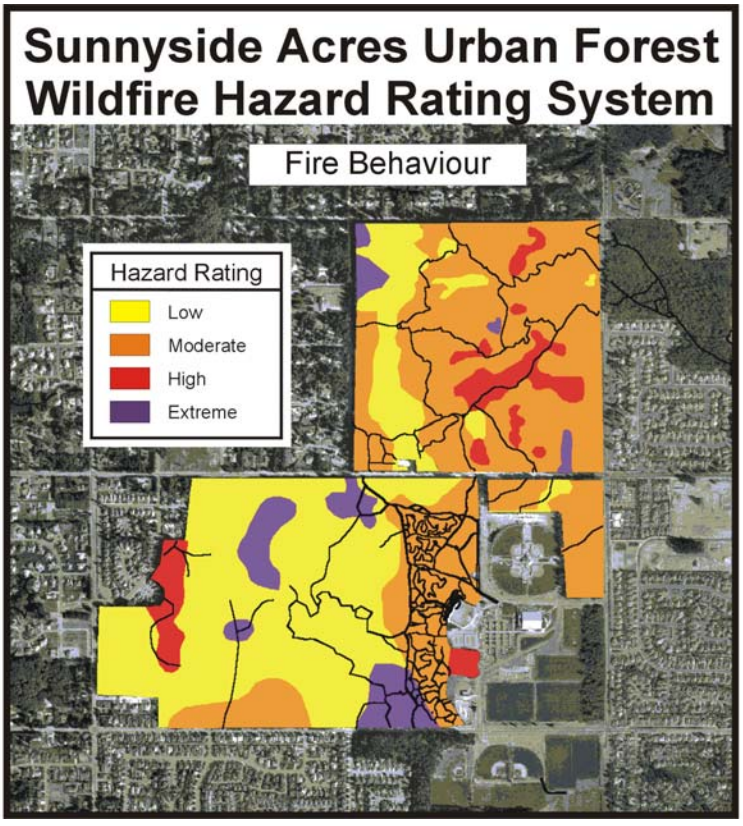
- Fine fuel moisture code (FFMC) =89
- Build-up Index (BUI) =95
- Wind speed =15 km/hr

The outputs from the fire behaviour prediction system were categorized and weighted as follows:

Fire Behaviour Outputs Based on Weather Condition Predictions

Layer	Units	Unit Value = Weight
Fire Intensity	Kilowatts per metre (kW/m)	0-500 = 2 501-2000 = 4 2001-4000 = 6 4001-10000 = 8 10001-30000 = 9 >30000 = 10
Rate of Spread	Metres per minute (m/min)	0-5 = 1 6-10 = 2 11-20 = 3 21-40 = 4 >40 = 5
Crown Fraction Burned	Percent of canopy crown burned	0 = 0 1-9 = 3 10-89 = 6 90-100 = 10

Map 5. Fire Behaviour



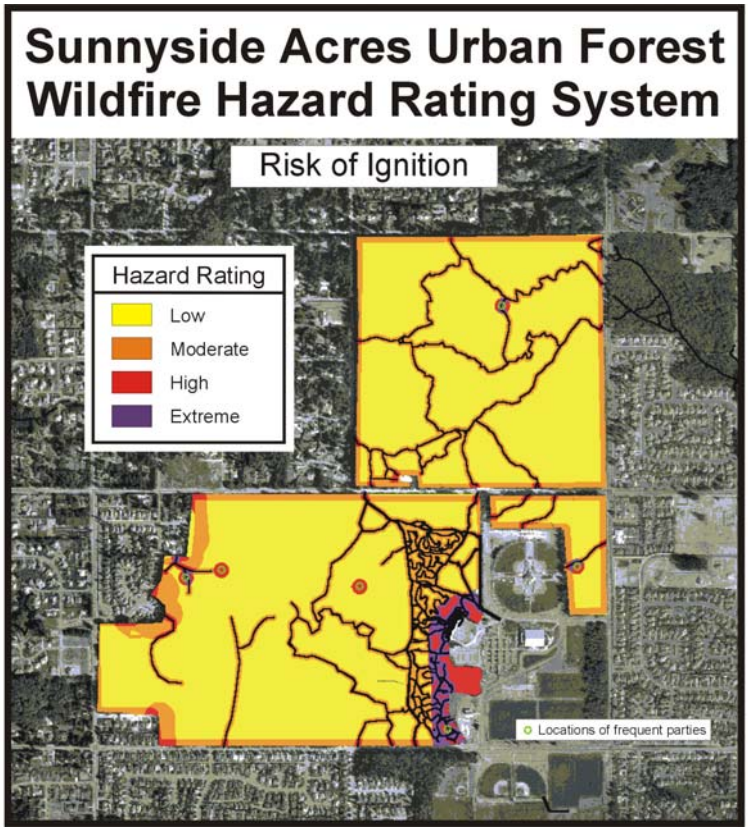
v) The Risk of Ignition

The risk of ignition in Sunnyside Acres Urban Forest is primarily from human activity. The most common source of ignition includes the use of motorized machinery, discarded cigarettes and matches from smoking, fires started in houses adjacent to the park and from bonfires lit within the park. Additionally there is a low risk of ignition from trees falling and displacing live wires from adjacent power lines. Generally, however, because of BC Hydro's intensive monitoring along hydro corridors, the risk is low.

The risk of ignition has been accounted for by buffering the locations where fires are most likely to be started and assigning them a higher hazard rating. A 10 metre buffer was placed around all trail systems and a 20 metre buffer around all roads adjacent to the park. Buffers of 100 metres were also placed around the interface areas where housing developments have been built up against the forest edge. Areas that are frequented by party goers and where bonfires have been previously lit have been identified. Additionally, a 20 metre buffer was placed around the forested areas adjacent to power lines. These areas were all given a higher ignition hazard weighting. Weight designations are assigned assuming regular hazard tree assessments are done.

Layer	Weight
Areas within 10 metres of any trail	5
Areas within 20 metre of any roads	5
Areas within 20 metres of power lines[1]	2
Areas within 50 metres of housing	3
Areas frequented by party goers	10

Map 6. Risk of Ignition

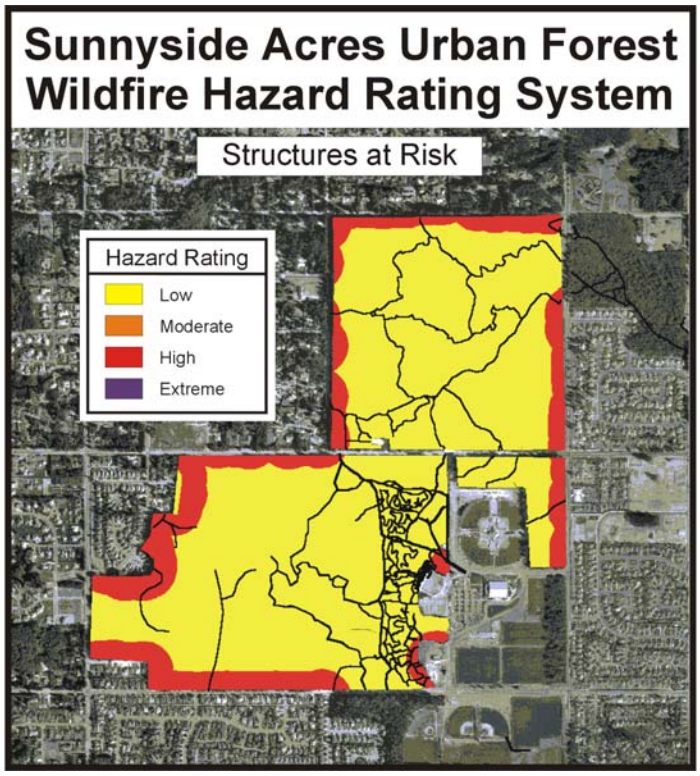


vi) Structures at Risk

Structures at risk include all human-made structures of significant value that have the potential to be destroyed or damaged by a wildfire. The locations of these structures (primarily housing) were identified from air photos and through ground visits. All areas within 100 metres of these structures were given a higher hazard rating of 25.

Layer	Weight
All areas within 100 metres of an adjacent structure	25

Map 7. Structures at Risk.

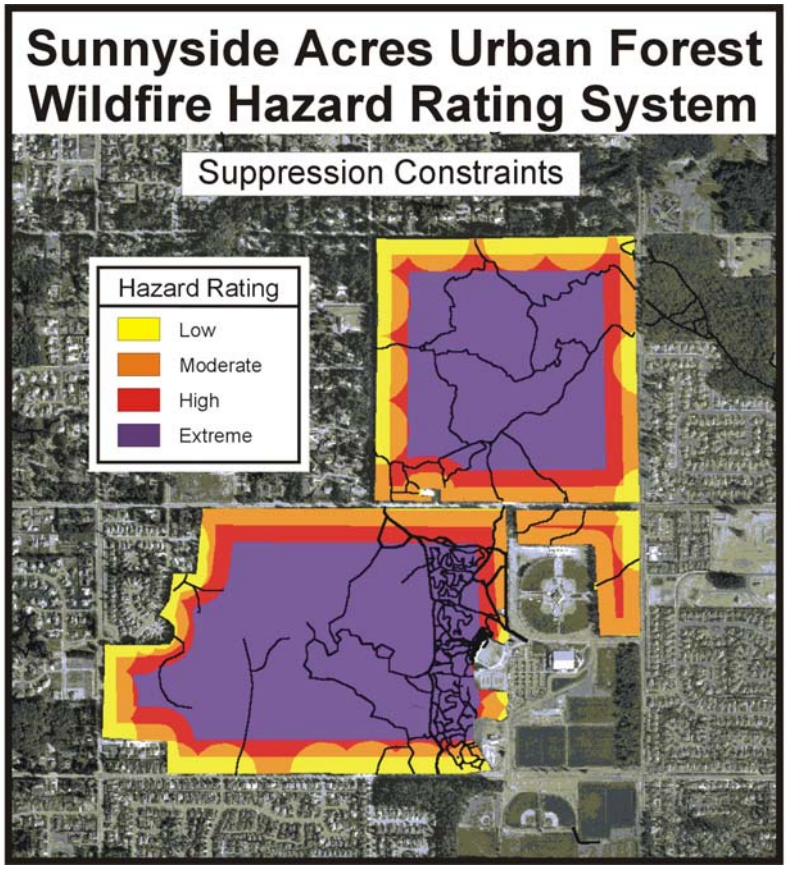


vii) Suppression Constraints

The assessment of suppression constraints is based on the availability of suppression resources, access restrictions and topographical features. Because Sunnyside Acres exists in an urban setting where resources are located nearby, suppression response will be relatively fast. Additionally, the terrain is fairly flat and easily accessible. The greatest constraint is the isolation of the fire within the park and access to water sources (fire hydrants). This increased isolation factor is accounted for by assigning increasing hazard ratings with distance from the roads. Areas further than 100 metres from fire hydrants have been given a higher hazard rating. The weighting scheme used is as follows:

Layer	Units	Weight
Distance from roads	0 – 50 metres from a road 50-100 metres from a road >100 metres from a road	5 10 20
Availability of water sources	Areas less than 100m from a fire hydrant Areas greater than 100m from a fire hydrant	0-4.5 5+

Map 8. Suppression Constraints.



C. FIRE MANAGEMENT ZONES

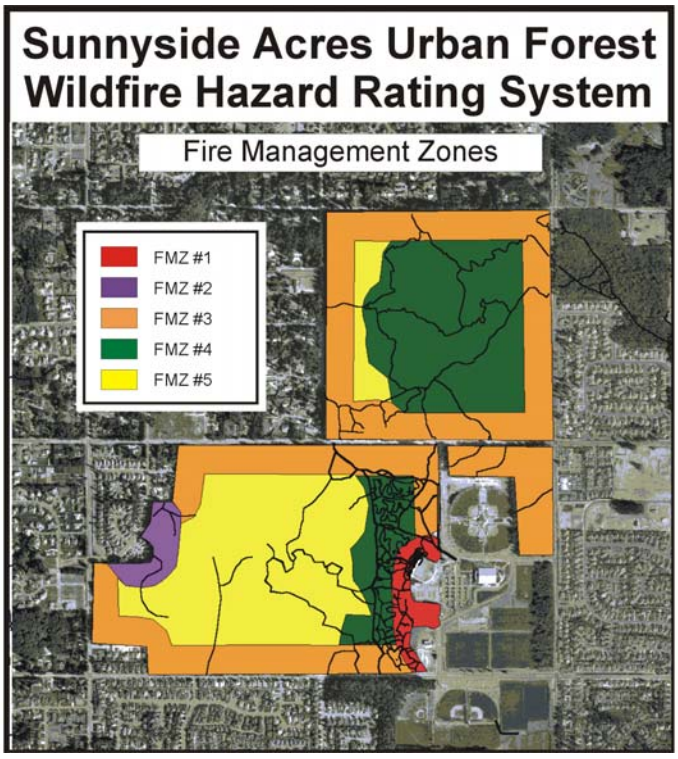
The wildfire hazard rating for Sunnyside Acres Urban Forest forms the basis for the establishment of five fire management zones. Each of these zones is characterized by distinct hazards and conditions that require specific stand level management prescriptions. These characteristics have been summarized and actions recommended for each management zone. The hazard ratings for the Wildfire Hazard Rating System are summarized in Table 1.

Table 1. Summary of the hazards within each fire management zone.

Management zone	Fire Behaviour	Risk of Ignition	Structures at Risk	Suppression Constraints	Overall wildfire hazard
1. Bike Park	M-H	E	M	L	H-E
2. Adjacent Housing: 24th Ave. and 140th St.	M	M-E	H	L-M	H-E
3. Perimeter Interfaces	L-H	M	M	L	L-H
4. Isolated Douglas-firs with Root Rot Pockets	M - E	L-M	L	M	M
5. Isolated Deciduous Stands	L-M	L	L	M	L-M

*L = low, M = moderate, H = high, E = extreme

Map 9. Fire Management Zones



1. FIRE MANAGEMENT ZONE 1 (FMZ-1): BIKE PARK

Fire Management Zone 1 is located in the bike park adjacent to the skateboard park, tennis courts and BMX track. It is adjacent to but *not* in the Urban Forest. The primary concern in this area is the risk of ignition. People are often found smoking and drinking in this area and have been known to light bonfires. The overall fire behaviour hazard is moderate to high. If a ground fire is started in this area, it could spread into the crowns of the trees and threaten to move through the adjacent Douglas-fir stand and "mixed wood" fuel types. Additionally there are dead standing fuels and significant ground fuel accumulations caused by a number of small root rot centres. These fuels would increase the intensity and rate of spread of any fire started in this area.

The two significant structures at risk are the Youth Centre and the communications tower although there is a significant fuel-free buffer separating them from the forest. A fire in this area would likely be detected quickly by local residents and nearby traffic. Suppression efforts would be facilitated by the numerous trails, the proximity to roads and by the presence of two fire hydrants in the athletic park. Measures to reduce wildfire hazard include removal of ground and ladder fuel accumulations (fallen trees, dead standing trees, etc), discouragement of party goers, signage, access restrictions and monitoring.

a. Fire Behaviour

The overall fire behaviour hazard in this area is moderate to high. Under 90th percentile weather conditions the rate of spread of a wildfire would be from 3-6 metres per minute, the fire intensity would be from 2500-4000 kW/m and the crown fraction burned would be from 0 to 22%. According to the MOF Forest Protection fire intensity ranking system, this would be classified as a rank 4 fire.

This area is generally dominated by mature Douglas-fir trees classified as fuel type C6. The ground fuel loading is predominantly low to moderate with localized high accumulations caused by a number of small root rot centres in the area. The ladder fuels are low to moderate. Where present, these ladder fuels pose a risk of carrying a ground fire into the crown where it would become more difficult to bring under control.

If a fire started in this area, the greatest risk would be movement up the ladder fuels into the crowns of the trees, and then north and west through the adjacent C-6 and M-2 fuel types.

b. Risk of Ignition

The risk of ignition in this management zone is extreme. Because it is located in the bike park and is adjacent to the skateboard park, BMX track and tennis courts, this area experiences heavy pedestrian traffic. Potential ignition sources in this area include motorized work machinery in and adjacent to the park, smoking from human traffic and party goers who frequent the area, and occasionally light bonfires in the park.

c. Structures at risk

There are two significant structures at risk along this interface area-- the Youth Centre and the communications tower. Although a high intensity fire could pose a threat to these structures, there is currently an adequate buffer between them and the forested stand.

d. Suppression constraints

Adjacent roads and numerous trails throughout the stand provide good access for suppression resources. Additionally there are two fire hydrants located relatively nearby in the athletic park.

e. Primary Concerns

- The risk of ignition from pedestrian traffic and party goers
- Pockets of heavy fuel accumulations both standing and on the ground from root rot disease centres
- Moderate levels of ladder fuels which could potentially carry a ground fire into the crown

f. Actions to Reduce Wildfire Hazard

- In the 20 metres adjacent to the athletic park, reduce the amount of ladder fuels under 5 metres. This will include removing the suppressed conifers, dead standing trees, tall woody brush species and dead branches.

- Identify and reduce heavy ground fuel accumulations.

- Identify areas where partying is frequent and there are remains of past bonfires. Rehabilitate these areas by removing all fire pits and dismantling any shelters. Discourage any future partying by placing

obstacles across the area and, where feasible, plant brush species and small deciduous trees.

- Put a fence up along the west edge of the skateboard park to discourage access into the forest.

- When the MOF Fire Danger Rating is high, set up a monitoring program so that volunteers patrol this area on Friday and Saturday nights just after dark.

- Once the MOF Fire Danger Rating reaches extreme, increase monitoring to every night after dark

- .Ensure that grass adjacent to the park is kept short to prevent curing.

2. FIRE MANAGEMENT ZONE 2 (FMZ-2): ADJACENT HOUSING AT 24TH AVENUE AND 14OTH STREET

Fire Management Zone 2 is located in a mixed conifer and deciduous stand adjacent to the housing development at 24th Avenue and 140th St. The primary concern in this area is the risk of ignition caused by fires started in the adjacent housing units and from party goers in the park. A focal point of concern is an area where a small shelter has been built and there is evidence of smoking and drinking. The overall fire behaviour hazard in this area is moderate; however, if a fire ignited here it would not spread far for this area is surrounded by wet, deciduous dominated forest. The greatest risk posed by a wildfire is to the housing developments which are located against the forest edge. A fire would likely be detected quickly by local residents and there is good access for suppression resources to this area from adjacent roads. Measures to reduce the hazard include the removal of ground and ladder fuel accumulations (fallen trees, dead standing trees, etc), discouragement of party goers, distribution of wildfire awareness brochures to residents, and monitoring.

a. Fire Behaviour

The overall fire behaviour hazard in this area is moderate. Under 90th percentile weather conditions the rate of spread of a wildfire would be about 5.3 metres per minute, the fire intensity would be about 3800 kW/m and the crown fraction burned would be about 17%. According to the MOF Forest Protection fire intensity ranking system, such a fire is classified as a rank 4. Descriptions of the fire behavior characteristics and fire suppression interpretations for this rank can be found in Appendix B.

The stand is composed of about 50% conifer and 50% deciduous species. This fuel type is classified as primarily M-2. The ground fuel loading is generally

moderate with some localized heavy accumulations of fuel from illegal dumping. The ladder fuel accumulations are generally moderate.

If a fire started in this area, it would not easily spread eastward through the rest of the park as most of the surrounding area is dominated by a wetter deciduous forest. It could, however, spread south through the small island of drier M-2 fuel type.

b. Risk of Ignition

The risk of ignition in this management zone ranges from moderate to extreme. There are a number of houses located up against the forest edge. Any fires started in or around these houses could easily spread into the park. One of the greatest concerns in this zone is an area where a small shelter has been built and there is evidence of smoking and drinking. Of less concern are two small trails which experience a low level of traffic.

c. Structures at risk

There are numerous houses which have been built along this interface area. These houses are located up against the forested edge and are at high risk if a fire started in this area.

d. Suppression constraints

From adjacent roads there is good access for suppression resources to this area, and there are numerous fire hydrants nearby. Direct access, however, is complicated by the location of the houses against the forest edge.

e. Primary concerns

- The risk of ignition from party goers in the park
- The risk of fires started in the adjacent houses
- Fuel accumulations on the ground caused primarily by the dumping of woody materials
- Moderate levels of ladder fuels which could potentially carry a ground fire into the crown
- The threat to adjacent houses from a wildfire

f. Actions to reduce wildfire hazard

- Distribute an educational brochure to adjacent homes regarding the protection from wildfire
- In the 20 metres adjacent to the athletic park, reduce the amount of ladder

fuels under 5 metres. This will include removing the suppressed conifers, dead standing trees, tall brush species and dead branches.

- Identify and remove fuel accumulations from dumping.
- Identify areas where partying is frequent and where there are remains of past bonfires. Rehabilitate these areas by removing all fire pits, and dismantle any shelters. Discourage any future partying by placing obstacles across the area and, where feasible, plant brush species and small deciduous trees.
- When the MOF Fire Danger Rating is high, set up a monitoring program so that volunteers patrol this area on Friday and Saturday nights just after dark.
- Once the MOF Fire Danger Rating reaches extreme, increase monitoring to every night after dark.

3. FIRE MANAGEMENT ZONE 3 (FMZ-3): PERIMETER INTERFACES

Fire Management Zone 3 includes the interface areas which extend around the perimeter of the park excluding the areas in FMZ's 1 and 2. Because it contains a wide variety of fuel types, the fire behavioiur hazard varies from low to high. The greatest risk exists in the area north of 24th Avenue where the fuel type is dominated by coniferous species. The greatest risk of ignition comes primarily from pedestrians and cars on the adjacent roadways. There is a small risk of ignition from power lines located along the edge of the forest. The numerous structures adjacent to the park are protected by the roads, although a severe wildfire could cross this buffer. A fire starting in this area would likely be detected quickly by local residents or traffic and would be easily accessible for suppression resources. Additionally there are numerous fire hydrants located along the residential streets bordering this zone. Preventative measures should include removing dumping materials, keeping the grass short on boulevards and removing hazard trees adjacent to power lines.

a. Fire Behaviour

Due to the varying fuel types and topographical attributes, under 90th percentile fire weather conditions the fire behaviour hazard varies from low to high across this management zone. The predominantly deciduous forest type south of 24th Avenue and west of the athletic park makes the fire behaviour hazard here generally low. There are some islands of coniferous stands with moderate to high fire behaviour hazards. North of 24th Avenue. and in the north-east section of the athletic park, the forest is predominantly coniferous and the fire behavior hazard is generally moderate. The ground fuels and ladder fuels vary from low to moderate throughout this zone.

A fire starting in this zone would not spread quickly through the deciduous forest type. The greatest danger is in the area north of 24th Avenue where a fire could spread into the park through the C-6 and M-2 fuel types.

b. Risk of Ignition

The risk of ignition in this management zone is moderate and would primarily come from the automobile and pedestrian traffic along the adjacent roadways. This risk is slightly higher where power lines are located along the forest edge and where trails emerge onto the street.

c. Structures at risk

Residential housing exists adjacent to most of the park. Most of these houses are separated by the roads around the park although a high intensity fire could cross this buffer. A few houses are located against the forest edge in the housing development just south of 24th Avenue at 141st Street and would be a greater risk.

d. Suppression constraints

There is good access for suppression resources in this zone from the adjacent roads. Fire hydrants are generally accessible on all adjacent roads except along 24th Ave.

e. Primary concerns

- The risk of ignition from vehicle and pedestrian traffic along the adjacent roads
- The risk of ignition from trees falling and displacing live wires from adjacent power lines
- The risk of wildfire to adjacent structures
- The spread of a wildfire into FMZ 4

f. Actions to reduce wildfire hazard

- Identify and remove all fuel accumulations from illegal dumping
- Ensure that grass adjacent to the park is kept short to prevent curing
- Ensure all hazard trees adjacent to power lines are removed

4. FIRE MANAGEMENT ZONE 4 (FMZ-4): ISOLATED DOUGLAS-FIR STANDS WITH ROOT ROT POCKETS

Fire Management Zone 4 consists primarily of coniferous fuel types with scattered root rot centres located away from the edges of the park. Most of the

area is located north of 24th Avenue with a smaller portion adjacent to the west side of the athletic park. The fire behaviour hazard in this zone is moderate to extreme. The ground fuel loading is moderate in the coniferous fuel type and high in the root rot centres. The risk of ignition in this zone is low to moderate with the greatest risk from pedestrian traffic along trails.

The primary concerns in this area are the potential fire behaviour characteristics and the accessibility for suppression resources. Under extreme fire weather conditions, a ground fire could spread into the crown and move quickly throughout these coniferous stands. There are a number of large root rot centres which contain dead standing fuels and heavy ground fuel accumulations. These areas would greatly increase the fire intensity and rate of spread of a wildfire. A fire may not be detected quickly in this isolated part of the park, nor would it be easily accessible for suppression resources. Preventative measures should include discouraging party goers and removing heavy fuel accumulations along trails.

a. Fire Behaviour

The overall fire behaviour hazard in this area is moderate to extreme. Under 90th percentile fire weather conditions, the rate of spread of a wildfire would be from 3-4 metres per minute in the C-6 fuel type to 7-8.5 metres per minute in the root rot centres. The fire intensity would be from 2500-3000 kW/m in the C-6 fuel type to greater than 50 000 kW/m in the root rot centres. The calculated output for crown fraction burned is 0%, although the dead standing fuel in the root rot centres could easily carry a ground fire into the crown. According to the MOF Forest Protection fire intensity ranking system, a fire in the C-6 fuel type and in the root rot centres would be classified as a rank 4 and rank 6 respectively. Descriptions of the fire behavior characteristics and fire suppression interpretations for this rank can be found in Appendix B.

The ground fuel loading is generally moderate in the C-6 fuel type to high in the root rot centres. The ladder fuels are generally low with high ladder fuels along the borders of the root rot centres where there is standing dead fuel. If a fire started in this area, the greatest risk would be movement into the crown of the trees and then through the Douglas-fir (C-6) fuel type.

b. Risk of Ignition

The risk of ignition in this management zone is generally low to moderate with the greatest risk from pedestrian traffic along trails. There is a significant risk of a fire starting in the fuel accumulations along trails located in root rot centres. There is also one confirmed area of risk with evidence of party goers smoking and drinking.

c. Structures at Risk

There are no structures at risk near this zone as it is located away from the edges of the park.

d. Suppression Constraints

Because this area is located away from all roads, access for suppression resources is somewhat limited. However, the suppression constraints are moderate overall as there are numerous trails and the terrain is relatively flat .

e. Primary Concerns

- The risk of a fire starting or spreading into one of the root rot centres
- The risk of ignition along trails by pedestrians
- The risk of ignition from party goers in the park
- Poor access for suppression resources

f. Actions to reduce wildfire hazard

- Identify areas where partying is frequent and there are remains of past bonfires. Rehabilitate these areas by removing all fire pits, and dismantle any shelters. Discourage any future partying by placing obstacles across the area and, where feasible, plant brush species and small deciduous trees.
- Identify and remove all heavy fuel accumulations along trails. Concentrate on areas where trails are located in root rot centers.

5. FIRE MANAGEMENT ZONE (FMZ-5): ISOLATED DECIDUOUS STANDS

Fire Management Zone 5 consists primarily of the deciduous fuel types located away from the edges of the park. The zone includes the areas located south of 24th Avenue and a smaller portion located just east of 144th Street and north of 24th Avenue. Overall, this zone poses a relatively low wildfire hazard as the site contains a high moisture regime and is dominated by fire resistant deciduous species.

The risk of ignition is generally low with the greatest risk from pedestrian traffic along trails. There are a number of small pockets dominated by coniferous species which pose the greatest concern in this zone. It is unlikely a fire would spread very quickly in this zone, although there is the risk of a fire moving through one of the islands of mixed conifer stands.

A fire may not be detected quickly in this isolated part of the park, nor would it be easily accessible by suppression resources. Preventative measures should include discouraging party goers.

a. Fire Behaviour

The overall fire behaviour hazard in this area is low in the deciduous stands to moderate in the islands of conifers. Under 90th percentile fire weather conditions the rate of spread of a wildfire would be about 2 metres per minute in the deciduous stand and 3-7 in the mixed stands. The fire intensity would be about 750 kW/m in the deciduous stands to 2500-6000 kW/m in the mixed stands. The crown fraction burned would be from 0% in the deciduous stands to 50% in the mixed stands. According to the MOF Forest Protection fire intensity ranking, this would be classified as a rank 3 to 5 fire. Descriptions of the fire behavior characteristics and fire suppression interpretations for this rank can be found in Appendix B.

The ground fuel loading is generally low and the ladder fuels are medium. Due to the high moisture regime and fire-resistant tree species, a fire would not likely spread very quickly in this zone. The greatest risk is of a fire moving through one of the islands of mixed conifer stands.

b. Risk of Ignition

The risk of ignition in this management zone is generally low with the greatest risk from pedestrian traffic along trails. There is also one confirmed area of risk with evidence of party goers smoking and drinking.

c. Structures at Risk

There are no structures at risk near this zone as it is located away from the edges of the park.

d. Suppression Constraints

This area is located away from all roads, limiting access for suppression resources. The suppression constraints overall are moderate as there are trails and the terrain is relatively flat .

e. Primary Concerns

- The risk of ignition within one of the pockets of M-2 fuel type.
- The risk of ignition from party goers in the park

f. Actions to reduce wildfire hazard

- Identify areas where partying is frequent and there are remains of past bonfires. Rehabilitate these areas by removing all fire pits and dismantle any shelters. Discourage any future partying by placing obstacles across the area and where feasible plant brush species and small deciduous trees.

6. GENERAL PREVENTION RECOMMENDATIONS

A. FIRE RISK ABATEMENT:

i) Ensure the City maintains its S-100 and urban forest awareness training program. It is the responsibility of Parks, Recreation and Culture Department to educate other City operations Departments on forest fire conditions.

ii) An additional high risk factor is the Canada Cup softball tournament which draws many visitors to Softball City in the Athletic Park. The tournament organizers should be asked to draw spectators' attention to the fire hazard; special monitoring may also be advisable.

iii) Assign a forest fire risk classification for Sunnyside Acres activities to ensure that during periods of high fire danger operational activities are conducted to minimize the risk of fire. This may mean that during certain periods of the fire season high-risk activities are either stopped or restricted to early morning hours. During extreme hazard periods, thorough wetting of fine fuels in the areas adjacent to Forest Edge and to the Youth Centre will suffice to minimize risk. Refuse, garden wastes and other debris should be cleared away from these two areas regularly during the fire season and entry discouraged. (The *Natural Areas Fire Management Plan Strategy* specifies that a scheme specific to Park operations is to be developed.)

iv) In extreme hazard conditions, the authority having jurisdiction over fire management decisions in Sunnyside may enforce closure of the Forest.

B. PUBLIC EDUCATION: provide public education programs focused on awareness, prevention and detection of fire in Sunnyside Acres. In order of priority, these initiatives are as follows:

i) The Parks, Recreation and Culture Department will establish signage to inform the public of fire danger risk ratings during the fire season by standard hazard rating display boards at the main parking lot entrance (off 24th Avenue) and at the weather station near the Athletic Park arena. (See "Fire Weather" below.)

ii) Public education should be focused on residents who live adjacent to

Sunnyside Acres Urban Forest. Within the City both the Fire Department and the Parks, Recreation and Culture Department should initiate a cooperative program to promote fire prevention strategies and provide information on fuel and fire conditions in the forest. The Surrey Fire Department will help edge residents do fire hazard audits (Communication from Surrey Fire Department).

The Ministry of Forests has a comprehensive information package (*Fire Safe*) that should form the foundation of materials required for this type of program. An annual awareness mail-out or delivery of flyers from *Fire Safe* in May might be an effective strategy.

iii) Other education opportunities include development of fire awareness through interpretive displays at public functions, such as Earth Day, Mayfair and tournaments at South Surrey Athletic Park. The local news media could also be helpful.

C. ACCESS MANAGEMENT: Develop an access management plan for identified areas of high fire risk in the forest.

Access controls provide an additional tool to reduce the level of fire risk within natural areas. Controls can limit the number of people entering into a specific area and reduce the potential for unwanted activities (such as late night parties). Additionally, where fire risk is high, access can be maintained, improved, or constructed to ensure prompt fire response. Other important access considerations include:

- regular inspections to insure that all gates and culverts are in good working condition
- standardization of locks on all gates on all subject lands
- distribution of keys to:

    1. Parks staff directly involved with Sunnyside Acres
    2. Caretaker of Crescent Park
    3. RCMP Community Policing Station, District 5

D. FIRE WEATHER: Collect fire weather data at both the fire weather station in Central Surrey (Parks Works Yard) and the Ministry of Forest's weather station in Chilliwack (TURF-ET).

Data should be recorded daily, at 1200 standard time, and should include the following:

- Maximum and minimum temperatures
- Ambient air temperature

- Relative humidity
- Wind run and direction
- Precipitation in the previous 24 hours

If climatic warming develops as many scientists predict, the fire regime in Sunnyside Acres, and elsewhere, can be expected to change, necessitating modifications to this Plan. It is recommended that in the future an additional weather station be installed in South Surrey.

E. PLANNING: Incorporate natural area fire prevention principles into all planning, design and construction activities for Sunnyside Acres.

It is also important that planning staff adhere to urban/interface fire prevention standards as outlined in the *Beware and Prepare Community Planner* as part of the planning process.

7. DETECTION

Fire detection activities in Sunnyside Acres should utilize city staff, trained volunteers, the local RCMP Bike Patrol (Community Policing Station District 5), the general public, signage, and effective communication strategies. This concerted effort will foster the early detection of a fire in the forest. Such coordinated participation and communication should be a key component of the City of Surrey's overall fire management effort. The earlier smoke is located and suppression crews from the Fire Department are dispatched, the greater the probability of reduced damage to public and private property.

The City can facilitate fire awareness through improved park signage and the education programs discussed above. To provide park visitors with accurate fire location information, signage should include the identification of park entrances and trail systems, and the instruction to call "911" if a fire is detected. Fire reporting information should be posted at strategic locations in Sunnyside—at the parking lot and all other entrances--allowing visitors to respond quickly and report fires to the Fire Department. To enhance response time, trails should be marked with numbers for easy location information. These numbers can be added to the Heart and Stroke distance markers and should use materials that will make them readable in the dark with a flashlight.

During periods of high to extreme hazard the Parks, Recreation and Culture Department will schedule regular patrols of these areas. These patrols could utilize staff, temporary volunteer fire wardens, and the RCMP Bike Patrol. Where the risk of hazard is considered high within a specific area, the use of resident caretakers should be considered. In addition to the detection function, these caretakers can serve in a dual role by alerting the public to current fire danger conditions.

Effective detection is heavily dependent on good communication. All departments within the City must be made aware of the chain of command, protocols and procedures for reporting a fire in Sunnyside Acres. A formal contact list will be developed and circulated by Parks, Recreation and Culture through all jurisdictions of the City. Once a year, and prior to May 30th, this contact information should be reviewed, updated and circulated to all involved parties, including RCMP District 5.

8. SUPPRESSION

Ensure that fire suppression activities are consistent with vegetation management goals.

A. THE SURREY FIRE DEPARTMENT

The City's Fire Department will take charge of suppression activities. According to the "Operational Guideline # 2.17.13" for fire suppression in "wildland/urban interface" areas, once a fire exceeds "400 feet from a hard surface" or "cannot be controlled or suppressed within one hour," the Fire Department's Incident Commander will "request immediate assistance from the Ministry of Forests" (see Appendix 6). The guideline further states that for such fires "the Fire Department and the MOF will work within a spirit of Unified Incident Command throughout the duration of the Urban Forest Fire incident.

In the year 2000, all Surrey firefighters received urban forest awareness training. This program instructs structural firefighters in the differences and nuances of interface firefighting. The Fire Department also has two service instructors who help provide S-100 training. A number of Surrey firefighters now have S-100 training (the completion of MOF training) and are available as "red carded" Forestry trained firefighters for urban/wildland interface fire incidents.

The "Suppression" component of the Sunnyside Acres plan provides an elaboration of the Fire Department's preparedness, available equipment, and strategy for a fire in Sunnyside Acres. The Fire Department also receives fire weather forecasts every second day and has acquired detailed maps of Sunnyside's trails, access points, and high-fire risk areas. (Communication with Officer in Charge, Training, Surrey Fire Department.)

A fire on Sunnyside Acres would involve the coordinated efforts of local Surrey Firehalls, Number 13 (South Surrey), 12 (Crescent), and 17 (32nd Avenue), and a water tanker team from the MOF at Hazelmere. Those firefighters with the S-100 qualification who have received urban forestry awareness training will be mobilized for the effort.

B. THE FIRE DEPARMENT'S RESPONSE PLAN

Should a fire occur, Firehall 13 will respond initially with one truck and call in additional resources if the Incident Commander (truck captain) deems it necessary. Each firehall will have a map of Sunnyside Acres that will go into the fire truck upon receiving the call. An initial report form and fire-ranking form, with pictures, will also go into the truck. The Fire Department will mount an aggressive manual attack up to 400 feet from the forest's edge. An elevated fire stream could be utilized from a tower. The fire service could commandeer a bobcat, depending on the availability of one from the South Surrey Parks workyards. (A constraint is that the bobcat should not exceed 1.5 metres in width.) Other available resources include a three-quarter ton pickup truck, a one ton booster truck from Hall 8, and, through a mutual aid agreement, Surrey could access quads from the Delta Fire Department.

If the fire continues to grow, the Battalion Chief for the City would take over. If necessary, the Chief would then call for air support, the most environmentally benign tactic, and fax a fire report to Victoria. An aerial reconnaissance would be carried out and a strategy decided upon. Sources for water drops would be the Nicomekel River and/or water hydrants at Softball City.

The Coastal Unit Crew would then be mobilized. This crew is a contracted forestry firefighting cadre of forestry suppression experts based out of the Green Timbers forestry camp (9800 140th Street). If this unit were busy, the call would then go to the Abbotsford Tanker Base (MOF), who will leave a revenue fire (on crown land or land with saleable timber) for a life-threatening or interface fire. Other air support resources could also be called upon, specifically a special operations group, the Emergency Services Detail, dedicated to helicopter response for a 300 mile radius emanating from Langley. This Emergency Services Flight Crew includes both tactical and flight crews and has access to helicopters in Langley; it would coordinate air support with the Rescue Coordination Centre in Victoria and the provincial emergency program. Should the air tankers at Abbotsford Tanker Base be relocated for fires in the interior of the province, a tanker could also be called in from Salmon Arm.

C. MINIMIZING ECOLOGICAL DAMAGE

To minimize ecological damage, any fire suppression activities should be consistent with fire management priorities for Sunnyside Acres. Earth-moving vehicles such as bulldozers should not be used except as a very last resort because of the disturbance which they cause to the environment. Machine-made firebreaks would be used only where deemed absolutely necessary. The

construction of temporary trails will be necessary for initial manual attack, with immediate trail closures and rehabilitation after mop-up. No wetting agents should be used for they can be very destructive if they miss their target. Measures to achieve these objectives are detailed above under "Fire Risk and Hazard Abatement."

9. REHABILITATION AND MITIGATION

Ensure that post-fire monitoring occurs and that rehabilitation is conducted promptly and appropriately from both an ecological and environmental perspective, and that it is compatible with vegetation management goals

For areas disturbed by fire, rehabilitation and mitigation strategies should be developed to be consistent with the ecosystem and vegetation management goals for Sunnyside Acres, recognizing the overall desire to maintain natural succession. These strategies should focus on trail rehabilitation and post-fire erosion control, limiting the effects of fire on accelerated sediment and nutrient release, and providing for re-establishment of native vegetation.

- The City's Parks Division will undertake and coordinate rehabilitation efforts, adopting the following strategies as needed:

  i) hazard abatement
  ii) erosion control
  iii) restoration of lost habitat elements
  iv) planting site preparation
  v) revegetation and reforestation, using native plant species
  vi) selective reintroduction of key wildlife species (when needed)
  vii) wildlife rescue

- Members of the rehabilitation team should include Parks Division employees, Fire Department members, Engineering Department employees, local environmental and community groups, volunteers, and possibly representatives from government agencies.

- The simplest approach to post-fire rehabilitation is to monitor the effects of fire in terms of plant recovery, erosion, and impacts on downstream water quality, and to rely on natural processes to mitigate fire effects. This approach is appropriate for small fires that result in a small burned area. For larger fire areas it may be necessary to intervene in natural processes. Basic rehabilitation techniques include erosion control and seeding or replanting with indigenous plant species.

In coastal BC, there is a growing body of information on watershed restoration

following disturbance. In Washington, Oregon, and California, a number of rehabilitation efforts have been successfully carried out following large fires. The Parks, Recreation and Culture Department should draw on this information base.

10 . TRAINING AND EQUIPMENT

Designated and appropriate Parks Operations Staff should have formal basic fire training. The Fire Department will provide an annual refresher course for designated Operations staff at the beginning of each fire season.

This should include training specific to Sunnyside Acres, including risk and hazard assessment, fuel management, fire ecology, and public education. Training will include the handling and use of fuels and other flammable materials in compliance with WCB operational guidelines and equipment.

There are a number of training courses available through the BC Ministry of Forests Protection Branch. Training could be facilitated through a Ministry approved private consultant or through a cooperative agreement with staff from the Protection Branch of the Ministry of Forests and the Surrey Fire Department.

The following courses are possibilities:

- S-100: Basic Wildland Fire Suppression and Safety
- S-210: Fire Cause Investigation
- S-211: Fire Weather
- WCB: Fallers Certification Course

11. ANNUAL REVIEW

The Sunnyside Acres Fire Management Plan should be reviewed and updated regularly. It is strongly recommended that an annual meeting involving all key stakeholders be held to review and, if necessary, augment and change or modify the Plan as needed (e.g. in response to climatic change). The review should take place in December and should include representation from the Parks Department, Fire Department, Sunnyside Acres Urban Forest Advisory Committee, and Forests Protection Branch.

12. MUTUAL AID AGREEMENTS

Where appropriate for Sunnyside Acres, mutual aid agreements as to roles and responsibilities should be cooperatively entered into to ensure that the principles of the Sunnyside Acres Fire Management Plan are implemented.

The Surrey Fire Department has mutual aid agreements with the MOF, GVRD and surrounding municipalities (White Rock, Langley, and Delta).

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IV. APPENDICES

Appendix 1. Letter from Surrey Fire Chief, 1999

SURREY
CITY OF PARKS

CITY OF SURREY
Fire Department

George Shaw G.
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August 10, 1999
File: 4900-019 (x 8350-001)

R.M. Strang, Ph.D.
Chairman, Sunnyside Acres Urban Forest
Advisory Committee, and
Chairman, Sunnyside Acres Heritage Society
2456 - 141 Street
Surrey, B.C., V4P 2E7

Dear Mr Strang:

In response to your letter of July 8, 1999, the Parks, Recreation and Culture Department (PR&C) has been working in consultation with the Fire Department, and the Ministry of Forests (M.O.F.) to develop a Fire Management Plan that can be implemented in "all" forested parks throughout the City. Your draft *Fire Management Plan for Sunnyside Acres Urban Forest* was certainly an informative document, based on the quality of your plan, the PR&C has utilized it as the basis for the City's "*Draft Urban Forest Fire Management Plan.*"

Background on the Issue of Protecting the Sunnyside Acres Urban Forest

- In the Fall of 1992, members of the Sunnyside Acres Heritage Society wrote the Mayor and Council expressing concerns regarding the consequences of a fire in the urban forest. Their letter also indicated an agreement for fire fighting could be made between Municipalities and the Ministry of Forests for all forest lands in our City.

- On May 20, 1993 the M.O.F. and the City of Surrey signed a Memorandum of Understanding (M.O.U.) pursuant that they will cooperate in attacking, controlling and extinguishing forest fires burning within the boundaries of the City of Surrey and the Chilliwack Forest District, with M.O.F. being the lead agency and the City providing support services.

  Existence of the M.O.U. assured the Fire Department and the City that the City's forested parks would be adequately protected from fire. The Fire Department did not require extensive forest fire fighting training or specialized equipment, because it was agreed that upon receipt of a report of, or upon arrival at a forest fire, the Fire Department would determine if it could control or extinguish the fire within one (1) hour of attack and immediately notify the Forest Service of that determination. If the Fire Department determined that it could not extinguish or control the fire within one (1) hour it would immediately request assistance from the M.O.F.

- On April 23, 1998, the M.O.F. issued Operating Guideline #1.06.01 Wildland Suppression and Local Government. This O.G. replaced all previous agreements (M.O.U.'s) with the

M.O.F. and placed the responsibility for suppression of fires within the City's forested parks with the City (the one (1) hour control or extinguishment criteria established under the M.O.U. no longer applied), and identifies the key element between the M.O.F. and a local fire department as one of "mutual aid" with the City being the lead agency and the M.O.F. providing support services.

Summary

The original M.O.U. with the M.O.F. permitted the Fire Department to rely heavily on the Forest Service to provide the necessary expertise and equipment to extinguish a fire within a forested park. With the issuance of the Operational Guideline the City is now expected to be self reliant and take full responsibility for fighting fires within the City's forested parks.

Since receiving notification from the M.O.F. in April 1998 that they had withdrawn or reduced their role in actively being engaged in the extinguishment or containment of a fire occurring within the City's urban forest, the PR&C has initiated a very active and concerted effort in developing a plan that would apply to all forested areas within our City Parks. We as the Fire Department have worked closely with Parks to ensure that our fire suppression activities are in support and in concert with the Plan.

The undertaking of the development of this Plan has not been taken lightly nor has it been considered a low priority.

The sudden notice of cancellation by the M.O.F. was untimely to say the least, had they given our City notice of or intent of cancellation we most assuredly would not have experienced the time lag between the cancellation of their plan and the development of ours. Although forest fire fighting is a specialized field I have every confidence that our fire fighting and support staff could respond to an emergency incident, assess and implement an operational tactic that would mitigate extended damage to our forests and the surrounding area.

I thank you for allowing us an opportunity to address your concerns and can assure you that both your Parks and Fire Departments have been working diligently on the development of an Urban Forest Fire Plan since receiving notification from the M.O.F. in April 1998 that they were downloading their prior responsibilities to the local jurisdiction, as in their opinion our City's forests were classified as Parkland and not Forests Land.

Sincerely,

J.G. Bale
Fire Chief

JGB/jc

c.c. Edmund P. Caissie, Councillor
Jeanne Eddington, Councillor
Owen Croy, Parks, Recreation and Culture: For your information

Appendix 2. Climatic Data

CLIMATIC DATA FOR SOUTH SURREY													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
PRECIPITATION (MM)													
Mean Rainfall	142	125	94	78	52	53	33	50	73	141	156	162	115
Mean Snowfall*	173	48	46	-	-	-	-	-	-	-	33	147	44
Mean Total	159	130	99	78	52	53	33	50	73	141	159	177	120
DAYS OF													
Measurable rain	18	16	15	15	10	9	7	8	9	17	19	19	162
Measurable snow	6	1	1	-	-	-	-	-	-	-	1	4	13
Measurableprecipitation	20	16	16	15	10	9	7	8	9	17	20	21	169
TEMPERATURE (Degrees C)													
Daily maximum	4.5	7.7	9.5	13.1	17.2	19.3	22.5	21.8	19.4	14	8.5	5.8	13
Daily minimum	-1.3	0.6	2.0	4.2	7	9.4	11.6	11.7	9.6	6	2.2	0.6	5
Daily mean	1.9	4.2	5.6	8.5	12.1	14.6	17	16.5	14.5	10.3	5.3	3.3	9
Extreme max.	12.2	17.5	18	25.6	26.1	29.4	36	34	31	25	17.5	15	36
Extreme min	-12	-8	-15	-3.9	1.7	1.1	5.6	5	4	-0.6	-7.8	-13	-15
Days w/frost	20	14	9	2	-	-	-	-	-	1	10	12	68
Degree days above 18 C**	-	-	-	-	0.4	3.8	17.9	13.3	0.9	-	-	-	36.3
Hours of bright sunshine**	53.5	87.2	129.3	180.5	246.1	238.4	307.1	256.2	183.1	121	69.3	47.9	1919.6
Water equivalent = 10%													Source Canadian Climatic Normals
**Data from Vancouver International Airport													

Appendix 3: Consecutive Days With No Measurable Precipitation.

# of Days	Beginning on
58	June 14, 1951
53	July 18, 1986
42	July 02, 19??
41	July 07, 1990
38	July 20, 1939 July 08, 1961
34	July 13, 1972 July 02, 1984
32	June 07, 1940 June 30, 1985 Sept 13, 1991 July 16, 1998
30	August 18, 1998
28	March 30, 1951 July 24, 1952 July 06, 1959 August 31, 1975
27	July 11, 1938 August 27, 1975
26	July 20, 1954 April 23, 1958 August 13, 1974
25	August 21, 1989

Appendix 4: Summer Rainfall at Sunnyside Acres.

	1989		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		Mean	
	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days	mm
May	13	118.8	14	45.1	8	64.0	6	14.8	13	85.8	9	31.2	6	35.9	11	75.2	14	139.5	8	95.0	11	56.0	10.3	69.2
June	10	45.7	15	90.8	14	51.4	6	68.6	14	89.0	10	63.0	13	43.0	8	16.5	10	75.7	6	32.8		nd	10.6	57.7
July	8	37.4	5	8.4	8	26.2	6	57.6	12	62.6	3	14.2	3	65.2	5	14.4	8	90.2	8	25.8	8	59.0	6.7	41.9
Aug	8	94.2	5	39.8	11	124.6	5	27.0		nd	6	22.2	13	75.2	5	26.7	7	32.6	1	7.0	11	36.4	7.2	49.3
Sept	2	13.2	5	25.8	3	7.8	5	50.2		nd	7	91.4	8	20.4	9	82.3	10	96.2	3	18.4	5	11.0	5.7	41.7
TOTAL	**41**	**309.3**	**44**	**209.9**	**44**	**274.0**	**28**	**218.2**	**39**	**237.4**	**35**	**222.0**	**43**	**239.7**	**38**	**215.1**	**49**	**434.2**	**26**	**179.0**	**35**	**162.4**	**40.5**	**259.8**

Appendix 5: Interface Community Fire Hazard Form (*Fire Safe*).

INTERFACE COMMUNITY FIRE HAZARD FORM

Location:

Forest District: Map Reference:

Completed By: Date:

COMMUNITY DESCRIPTION:

Fire Weather Potential	Rarely Class 3 and above 0 Points	Sometimes Class 3 and above 4 Points	Often Class 3 and above 10 Points	Long Periods Class 3 and above 20 Points	
Area Description	Strictly Urban 0 Points	Suburban; Scattered Forest 2 Points	Rural; Scattered Forest 4 Points	Rural; Continuous Forest 6 Points	
Thickness of Duff Layer	<5cm. 1 point	≥ 5cm to < 13cm 3 Points	≥ 13cm to <20cm 5 Points	≥20 cm 6 Points	
Fine and Coarse Debris	None or spread > 5m. apart; Not elevated 1 point	Scattered branches and tops; Not elevated 2 Points	Scattered branches; grouped, crossed,< 1 m high 5 Points	Contiuous; grouped, crossed, > 1m high 6 Points	
Forest Stand Description	Generally Deciduous 0 Points	Mixed Deciduous and Coniferous 3 Points	Generally Coniferous 6 Points	Dense Pine Stand 8 Points	
Other Vegetation	Primarily Domestic 0 Points	Domestic or Wildland Grasses 2 Points	Primarily Wildland Brush, Salal, etc. 4 Points	Primarily Broom or Gorse 6 Points	
Topographic Features	Generally Flat 0 Points	Gently Rolling 2 Points	Rolling and Gullied 4 Points	Many Steep Areas 6 Points	
Values Protected	No Significant Dev;Wildland Values Only 2 Points	Complete Dev.; Fire potential perimeter only 4 Points	Incomplete Dev.; Fire potential throughout 6 Points	Lot sizes larger than 1 hectare 6 Points	
Recreational Use	No signs of Obvious Use 2 Points	Infrequent Use 4 Points	Frequent Use 6 Points	High use 8 Points	
Fire Potential on Adjacent Lands	No Significant Fire Potential 0 Points	Low Fire Potential 2 Points	Medium Fire Potential 4 Points	High Fire Potential 6 Points	

FIRE SUPPRESSION CAPABILITIES:

Fire Protection	Fully Paid Fire Dep't. 0 Points	Volunteer Fire Dep't. Multiple Halls 2 Points	Volunteer Fire Dep't; Single Hall 6 Points	No local Fire Protection 10 Points	
Available Water	Good Hydrant Coverage 1 point	Partial Coverage; Water within 350m 2 Points	No Hydrants but good water supply within 500m 4 Points	No Hydrants and Poor water supply 6 Points	
Mutual Aid	Multi-dep't. mutual aid agreements 0 Points	Limted Mutual aid with fire dep'ts 2 Points	Only B.C.F.S. aid through agreement 4 Points	No agreement with any agency 6 Points	
Response Time to Fire	>15 minutes 0 Points	30 minutes 2 Points	60 minutes 4 Points	90 minutes 10 Points	
Access for Emergency Vehicles	Area generally fully accessible (tank truck) 0 Points	Some areas have access problems (mini pumper) 2 Points	Narrow winding road; Bridge load limits (mini pumper) 5 Points	Significant areas of inaccessability (air/foot) 6 Points	
Fire History of Area	0-2 fires 0 Points	2-5 fires 3 Points	5-15 fires 6 Points	15+ fires 11 Points	

OTHER FACTORS:

Frequent wind speeds over 30km/h	Extensive areas of steep south or west exposure slopes	Large scale industrial project anticipated	Large scale recreational project anticipated	Fuel loading increase due to logging or land clearing activity	Railway activity within the interface zone	Utilities within the interface zone	TOTAL POINTS
0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	

INTERFACE COMMUNITY FIRE HAZARD RATING:

0-55	**Low**	**Green**
56-70	**Moderate**	**Yellow**
71-85	**High**	**Orange**
86 +	**Extreme**	**Red**

RATING

Location:

Forest District: Map Reference:

Completed By: Date:

COMMUNITY DESCRIPTION: *Points:*

Fire Weather Potential	Rarely Class 3 and above 0 Points	Sometimes Class 3 and above 4 Points	Often Class 3 and above 10 Points	Long Periods Class 3 and above 20 Points	
Area Description	Strictly Urban 0 Points	Suburban; Scattered Forest 2 Points	Rural; Scattered Forest 4 Points	Rural; Continuous Forest 6 Points	
Thickness of Duff / Litter	< 5 cm 1 Point	≥ 5 cm to < 13 cm 3 Points	≥ 13 cm to < 20 cm 5 Points	≥ 20 cm 6 Points	
Fine and Coarse Debris	None or spread > 5 m apart; Not elevated 1 Point	Scattered branches and tops; Not elevated 2 Points	Scattered branches; grouped, crossed, < 1 m high 5 Points	Continuous; grouped, crossed, > 1 m high 6 Points	
Forest Stand Description	Generally Deciduous 0 Points	Mixed Deciduous and Coniferous 3 Points	Generally Coniferous 6 Points	Dense Pine Stand 8 Points	
Other Vegetation	Primarily Domestic 0 Points	Domestic or Wildland Grasses 2 Points	Primarily Wildland Brush, Salal, etc. 4 Points	Primarily Broom or Gorse 6 Points	
Topographic Features	Generally Flat 0 Points	Gently Rolling 2 Points	Rolling and Gullied 4 Points	Many steep areas or Rock outcrops 6 Points	
Values Protected	No significant dev.; Wildland values only 2 Points	Complete dev.; fire potential perimeter only 4 Points	Incomplete dev.; fire potential throughout 6 Points	Lot sizes larger than one hectare 6 Points	
Recreational Use	No signs obvious use 2 Points	Infrequent use 4 Points	Frequent use 6 Points	High use 8 Points	
Fire Potential on Adjacent Lands	No significant fire potential 0 Points	Low fire potential 2 Points	Medium fire potential 4 Points	High fire potential 6 Points	

FIRE SUPPRESSION CAPABILITIES:

Fire Protection	Fully paid fire dept. 0 Points	Volunteer fire dept.; Multiple halls 2 Points	Volunteer fire dept.; Single hall 6 Points	No local fire protection 10 Points	
Available Water	Good hydrant coverage 1 Point	Partial coverage; water within 350m 2 Points	No hydrants; but good water supply in 500m 4 Points	No hydrants and poor water supply 6 Points	
Mutual Aid	Multi - dept. mutual aid agreements 0 Points	Limited mutual aid with fire depts. 2 Points	Only B.C.F.S. aid through agreement 4 Points	No agreement with any agency 6 Points	
Response Time to Fire	15 minutes 0 Points	30 minutes 2 Points	60 minutes 4 Points	90 minutes 10 Points	
Access for Emergency Vehicles	Area generally fully accessible (tank truck) 2 Points	Some areas have access problems (mini pumper) 4 Points	Narrow winding road; Bridge load limit (mini pumper) 5 Points	Significant areas of inaccessibility (air/foot) 6 Points	
Fire History of Area	0 -2 Fires 0 Points	2 - 5 Fires 3 Points	5 - 15 Fires 6 Points	15+ Fires 11 Points	

OTHER FACTORS:

Frequent high winds over 30 km/h	Extensive areas of steep south or west exposure slopes	Large scale industrial project anticipated	Large scale recreational project anticipated	Fuel loading increase due to logging or land clearing activity	Railway activity within the interface zone	Utilities within the interface area	Total Points
0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	

Interface Community Fire Hazard Rating:

0 - 55	Low	Green
56 - 70	Moderate	Yellow
71 - 85	High	Orange
86+	Extreme	Red

Notes: **Rating:**

Shawn\fire3.doc

Appendix 6. Surrey Fire Department Operational Guideline # 2.17.13, Fire Suppression—Wildland/Urban Interface.

SURREY FIRE DEPARTMENT
OPERATIONAL GUIDELINE

Fire Suppression Wildland/Urban Interface	O.G. # 2.17.13	Page 1 of 2
	Eff. October 12, 1999	Init. of FC

PURPOSE: To state the response protocol for fires in urban-forested areas.

SCOPE: Deputy Chief, Assistant Chiefs, Battalion Chiefs, Fire Suppression Crews, Fire Prevention Inspectors and Communication Personnel.

POLICY: To provide a consistent and effective response to all fires in urban forested areas.

PROCEDURE:

1. Upon arrival of Fire Suppression Crews at a fire in an urban-forested area, the IC shall:

   - Conduct a thorough size-up.
   - Determine whether the initial-response suppression crews can control or suppress the fire within one hour.
   - Notify the Battalion Chief, Duty Chief (Assistant Chief), and the M.O.F immediately of the determination.

2. If the fire cannot be controlled or suppressed within one hour, or if the fire is more than 400 feet from a hard surface, the IC shall:

   - Request immediate assistance from the Ministry of Forests.
   - Notify the Fire Chief or designate for the purpose of assessing the need to initiate the City's Emergency Plan.

   If the fire can be controlled or suppressed within one hour, and is less than 400 feet from a hard surface, but is of significant size, the IC shall:

   - Request assistance from the M.O.F. for a "second opinion".
   - Request assistance from the M.O.F to work in concert with the fire department's investigator for fire cause determination.

3. When the IC is reporting a fire and/or requesting assistance the following information (Appendix "C" Ministry of Forest's *Initial Fire Report*) must be provided to the Ministry of Forest's Fire Control Officer in Parksville:

   - **Location of fire.**
   - **Size of fire.**
   - **Character of fire (open flame at ground or tree tops).**
   - **Rate of fire spread (slow, moderate, fast).**
   - **Wind speed/direction (if known).**
   - **Slope of land (flat, moderate, steep).**

SURREY FIRE DEPARTMENT
OPERATIONAL GUIDELINE

Fire Suppression Wildland/Urban Interface	O.G. # 2.17.13	Page 2 of 2
	Eff. October 12, 1999	Init. of FC

- What is burning (grass, brush, heavy timber, etc).
- Water available (hydrants, ponds, etc).
- Access to the fire.
- Apparatus, equipment and agencies enroute or on scene.
- Type of assistance required (Air tanker, ground crew, 2nd opinion).
- Radio frequency and IC.
- Power lines, gas lines, or other known safety concerns.
- What is threatened (life, property, environment).

4. The Fire Department and the M.O.F. will work within a spirit of Unified Incident Command throughout the duration of the Urban Forest Fire incident.

5. The M.O.F. may withdraw its services and return responsibility to the Fire Department when the fire is under control, its services are no longer required, or when its services are required at a higher risk incident.

6. Once the fire has been suppressed, fire watch is required for a period of two hours, or until the Duty Chief determines that a flare-up is unlikely.

7. It is the responsibility of the Fire Prevention Division in cooperation with the Ministry of Forests to determine the fire cause and prepare a provincial fire report. It is therefore imperative that all agencies make every effort to preserve and collect evidence.

Reference: Ministry of Forests O.G. #1.06.1 Wildfire Suppression and Local Government

Attachments:

Appendix A - Map of City of Surrey's major urban forests
Appendix B - Chart of Response Determination based on flame length. US Forest Service
Appendix C – Ministry of Forests Initial Fire Report Form

Signature of Fire Chief	This O.G. Replaces Issued on:

Appendix 7. Description of fire behaviour characteristics and fire suppression interpretations according to the MOF Forest Protection (BC Ministry of Forets, 2000).

Chart Rank	Frontal fire Intensity (Kw/m)	Description of fire behavior characteristics and fire suppression interpretations
1	<10	Smoldering ground or creeping surface fire. Firebrands and going fires tend to be virtually self-extinguishing unless high Drought Code (DC) and/or Buildup Index (BUI) values prevail, in which case extensive mop-up is generally required.
2	10-500	Low vigor surface fire. Direct manual attack at fire's head or flanks by fire-fighters with hand tools and water possible. Constructed fire guard should hold.
3	500-2000	Moderately vigorous surface fire. Hand-constructed fire guards likely to be challenged. Heavy equipment (bulldozers, pumpers, retardant aircraft, skimmers, helicopter w/bucket) generally successful in controlling fire.
4	2000-4000	Highly vigorous surface fire or passive crown fire (torching). Control efforts at fire's head may fail.
5	4000-8000	Extremely vigorous surface fire or active crown fire. Very difficult to control. Suppression actions must be restricted to fire's flanks. Indirect attack with aerial ignition (ie. helitorch and/or AID dispenser) may be effective.
6	>8000	"Blow-up" or "conflagration" type fire run; violent physical behaviour probable. Suppression actions should not be attempted until burning conditions ameliorate.

Appendix 8. Description of the Ministry of Forests Protection Branch fire danger ratings.

Fire danger ratings are calculated for the entire province based on the fire weather indices from a network of automated weather stations (www.for.gov.bc.ca/protect). The Danger Ratings are defined as follows:

Low: Low fire hazard

Moderate: Carry out any forest activities with caution

High: Fire Hazard is serious. Extreme caution must be used in any forest activities. Burning permits and industrial activities may be restricted

Extreme: Extremely high fire hazard. General forest activities may be restricted, including burning permits, industrial activities and campfires

Appendix 9. Operational Guideline #2.17.13, Response Determination

OPERATIONAL GUIDELINE # 2.17.13 **SCHEDULE "B"**

Appendix B
Response Determination Based On Flame Length
U.S. Forest Service

Flame Length	Appropriate Response
< 4 feet	- fire can generally be attacked at head by responders using hand tools - hand lines should hold the fire
4 – 8 feet	- too intense for direct attack with hand tools - hand lines cannot be relied on to hold fire - use dozers, pumpers, retardants and aircraft
8 – 11 feet	- serious control problems torching, crowning and spotting - control efforts at head of fire will most likely be ineffective
> 11 feet	-crowning, spotting and major runs are possible - control at head of fire will be ineffective

Appendix 10. Operational Guideline #2.17.13, Initial Fire Report

OPERATIONAL GUIDELINE # 2.17.13 SCHEDULE "C"

Province of British Columbia Ministry of Forests

INITIAL FIRE REPORT

GEOGRAPHIC LOCATION | ELEVATION | DATE Y M D | TIME

GRID: MAP 81 | GRID SQ. | NO. SQ. | SUB. SQ.

BEARING: DEGREE | MINUTE | VERTICAL ANGLE

REPORTED TO

REPORTED BY: AIRCRAFT IDENT. | C/O | OTHER | NAME | PHONE NO.

ALPHA - ESTIMATED SIZE
- ☐ 1. SPOT
- ☐ 2. < 0.2 ha
- ☐ 3. 0.2 - 1 ha
- ☐ 4. 1 - 2 ha
- ☐ 5. 2 - 4 ha
- ☐ 6. _____ ha

BRAVO - CHARACTER OF FIRE
- ☐ 1. SMOULDERING
- ☐ 2. OPEN FLAME
- ☐ 3. CROWNING
- ☐ 4. SPOTTING
- ☐ 5. _____

CHARLIE - RATE OF SPREAD
- ☐ 1. SLOW
- ☐ 2. MODERATE
- ☐ 3. FAST

DELTA - WIND SPEED/DIRECTION
- ☐ 1. CALM
- ☐ 2. 0 - 10 km/hr.
- ☐ 3. 10 - 30 km/hr.
- ☐ 4. 30+ km/hr.
- ☐ 5. N. W. S. E.

ECHO - SLOPE
- ☐ 1. FLAT
- ☐ 2. MODERATE
- ☐ 3. STEEP

FOXTROT - SLOPE EXPOSURE
- ☐ 1. NORTH
- ☐ 2. SOUTH
- ☐ 3. EAST
- ☐ 4. WEST

GOLF - POSITION ON SLOPE
- ☐ 1. BOTTOM
- ☐ 2. LOWER THIRD
- ☐ 3. MIDDLE THIRD
- ☐ 4. UPPER THIRD
- ☐ 5. TOP

HOTEL - FUEL TYPE
- ☐ 1. GRASS
- ☐ 2. BRUSH
- ☐ 3. DECIDUOUS
- ☐ 4. SLASH
- ☐ 5. REPRODUCTION
- ☐ 6. OPEN TIMBER
- ☐ 7. HEAVY TIMBER
- ☐ 8. _____

INDIA - ADJACENT FUEL
- ☐ 1. GRASS
- ☐ 2. BRUSH
- ☐ 3. DECIDUOUS
- ☐ 4. SLASH
- ☐ 5. REPRODUCTION
- ☐ 6. OPEN TIMBER
- ☐ 7. HEAVY TIMBER
- ☐ 8. _____

JULIET - AVAILABLE WATER
- ☐ 1. NONE
- ☐ 2. ADJACENT
- ☐ 3. _____ METRES
- ☐ 4. N. W. S. E. OF FIRE

KILO - ACCESS
- ☐ 1. ROAD _____ km
- ☐ 2. HELISPOT _____ km
- ☐ 3. BOAT _____ km
- ☐ 4. FLOAT PLANE _____ km
- ☐ 5. N. W. S. E. OF FIRE

LIMA - PAPER TRAILED
- ☐ 1. YES
- ☐ 2. NO

REMARKS (SPECIAL INFORMATION, e.g. LOCATION OF IMPROVEMENTS, CREWS, ON FIRE, TOURISTS, CAMPSITES, ETC.)

FIRE NAME | FIRE NO. | DISTRICT | RECEIVED BY | TIME

REMARKS (ACTION TAKEN, ETC.)