



# Kitseles First Nation Community Wildfire Protection Plan



Copperside Estate Fire 2005  
Photo: courtesy of Ralph Ottens

Prepared for: Kitseles First Nation  
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## **Endorsement**

The following individuals have reviewed and endorsed this report and the identified actions:

Glenn Bennett, Chief Councilor - Kitselas First Nation

Wilfred McKenzie, Resource Manager - Kitselas First Nation

## Executive Summary

This Community Wildfire Protection Plan was completed by Northwest Timberlands Ltd for the Kitselas First Nation. The intent of the report is to:

- Improve community safety.
- Protection of traditional and cultural heritage sites.
- Identify and map wildfire threat ratings for the wildland-urban interface.
- Discuss and identify with community stakeholders measures that should be taken to mitigate those risks.
- Outline a plan of action to implement those measures.
- Support and diversify current community economic opportunities.
- Enhance capacity of the Kitselas First Nation in undertaking long term forest fuel management activities including maintenance work.

The community's objective is to reduce the threat to developments from wildfires and to also reduce the threat of fires starting in the interface and spreading to the wildland.

- In the short term, the goal of the Kitselas First Nation is to fire-smart the communities in terms of creating fuel-free and modified fuel areas that are directly adjacent to the community cores.
- In the long term, Kitselas is looking at developing strategies and tactics to further fire-smart their communities. This will come in the form of evaluation and improvement of fire preparedness levels, educational training on fire smart principles and fuel management treatments outside of the core areas and outside the IR boundaries.
- An additional goal for the long term is ongoing maintenance of areas that receive fuel treatments. This will require additional pruning and ground fuel removal as well as the treatment of currently untreatable fuel types due to their current stage of development.
- Fuel treatment areas within and adjacent to the core development of Kitselas IR # 1 will enhance the community's objective of maintaining green space and buffers. This objective will enhance the aesthetics of the community as well as providing refuge for birds and small mammals.

The measures and actions identified in this plan can reduce the devastating effects of wildfire. Although the wildfire threat rating for the plan area has been determined to be moderate, there are critical conditions that do occur that will create high intensity and potentially devastating urban interface fires in which properties and lives could be at great risk. There are many examples throughout the province of large, intense fires that have occurred in the wildland-urban interface: the danger to lives and the damage caused have been significant.

It is the responsibility of local governments, the province, and the home owner to review the potential hazards and make changes that will reduce the effects of wildfires within the interface. There are many actions summarized in this plan that can be done to fire-proof our communities. They all begin with a proactive prevention program, planning and preparing for a fire occurrence, and reducing hazards where they exist.

A few small steps by people and groups in positions of responsibility will allow a collective approach to safeguarding and minimizing the risk. These steps have been itemized at the end of this report as "ACTIONS" and are summarized on pages 26 to 30.

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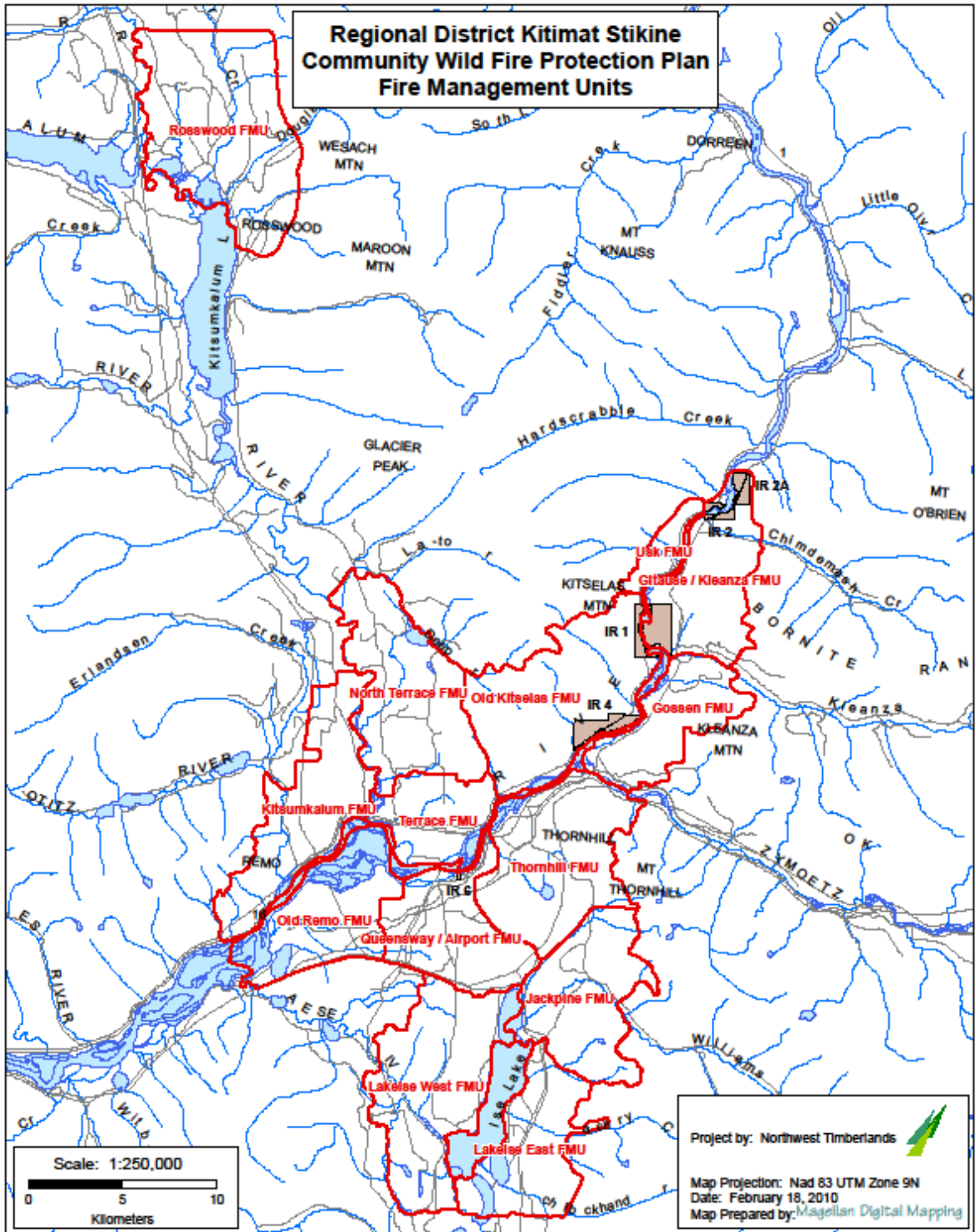
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### FMU Key Map



## Glossary of Terms

<b><u>Term</u></b>	<b><u>Description</u></b>
<b>BCTS</b>	BC Timber Sales
<b>C5 fuel type</b>	Classification of fuels as described by the Canadian Forest Fire Prediction System (FBP). C5 is a type of forest fuel as described in the report.
<b>FPB</b>	Canadian Forest Fire Behavior Prediction System. A tool that helps fire suppression agencies in predicting fire behavior given current weather conditions and forest fuel types
<b>Critical Fire weather</b>	When weather conditions reach levels where predicted fire behavior will produce high intensity fires
<b>Cross over days</b>	When humidity levels are lower than air temperature. This condition can produce extreme fire behavior with high intensity fires
<b>CWH</b>	Coastal Western Hemlock Bio-geo Climatic Ecosystem classification
<b>CWPP</b>	Community Wildfire Protection Plan
<b>EBAP</b>	Employment Bridging Assistance Program
<b>FFMC</b>	Fine Fuel Moisture codes
<b>Fire Protection Zone</b>	A geographic area that has fire protection services for structural fires. These areas are defined by distance and time to a designated fire hall
<b>Fire Smart Manual</b>	This interactive manual provides individuals with the necessary tools in planning and mitigating the risk of fire in interface areas
<b>FMU</b>	Fire Management Areas are designated to group smaller planning units into geographical areas that have similar terrain, development types, forest fuels, predicted fire behavior characteristics, fire protection services, and local government
<b>FNESS</b>	First Nations Emergency Services-British Columbia is a non profit organization to assist First Nations in developing and sustaining safer and healthier communities by providing programs, services and related training and education
<b>Fuel Modification Projects</b>	Projects designed to modify forest fuels in such a way as to effect, the chance of ignition starts , or the expected fire behavior in a given fuel type. Changes in expected fire behavior are designed to improve the success of control actions
<b>High intensity fires</b>	Fires that will exhibit very vigorous behavior and control actions are either indirect or can not be attempted until burning conditions ameliorate

<b>MOFR</b>	Ministry of Forests and Range
<b>OBSCR</b>	Open Burning Smoke Control Regulation
<b>OFC</b>	Office of the Fire Commissioner. The provincial body tasked with the Fire Smart Program
<b>RDKS</b>	Regional District of Kitimat Stikine
<b>Series 100/215</b>	Some of the fire suppression training courses as defined in the Fire Smart manual that are designed for cross training of suppression agencies in wildland and Urban interface fires
<b>Stand Management Plan</b>	A prescription/Plan for a parcel of land that sets management objectives and treatment options for the growing/tending and harvesting of trees
<b>Thresholds</b>	Bench mark conditions where changes in wild fire threat or fire behavior could be expected
<b>UBCM</b>	Union of BC Municipalities
<b>Wildfire Act</b>	Provincial Legislation pertinent to prevention, detection and suppression of wildfires
<b>Wildland Urban Interface (WUI)</b>	The area where structures and human development meet or intermingle with undeveloped wild land vegetation
<b>Wildland Urban-Interface Wildlife Threat Rating</b>	A numerical rating system that looks at four main components in assessing threats to structures and development from wildland fires. These components are forest fuels, terrain, structural placement and historic fire weather



## 1 Introduction

This report has been prepared in response to a request from Kitselas First Nation community leaders to participate in the Community Wildfire Protection Planning (CWPP) process, and has been funded by the First Nation's Emergency Services (FNESS). The basis of the report is to establish an assessment of local fuel types: i.e. to determine what fuel types exist and what hazard they contribute to the risk of wildland-urban interface fires.

The potential for devastating fires that destroy homes and properties is very much a real threat in the rural environment that dominates our communities. Fuel types combined with topography, fire weather and structural density will assist community planners in defining where risks occur and what can be done to reduce losses from fires and to improve the overall safety within the wildland-urban interface.

Areas in and around the reserves of the Kitselas First Nation are surrounded by forest fuels that are intermixed with development, which requires interface stakeholders to prepare for the potential of a wildland fire within the interface zone. This preparation will normally require a combination of strategies such as initiating public education programs in risk and hazard reduction, implementation of fuel management techniques, and ensuring fire preparedness levels meet the potential of fires starting and expected fire intensities. This report provides background and describes the appropriate strategies to be applied in the planning area. Implementation of these strategies will require the participation and involvement of all stakeholders to work together to mitigate the risks and damages caused by fire.

### 1.1 Area Description /Access /Location

This plan covers the inhabited reserves of the Kitselas First Nation located in the northwest region of British Columbia. The following reserves were included in the CWPP planning and assessment of forest fuels and the associated threats of wildland fires on the community core. Fuel modification treatments were completed within the boundaries of Kitselas and Kshish IRs in 2009 under the Natural Resources Canada Federal Mountain Pine Beetle Program.

Kitselas IR # 1 (Gitaus)	434.60 ha
Kshish IR # 4 and 4a	258.30 ha
Kulspai IR # 6	6.90 ha
Chimdemash IR #2 and 2A	184.40 ha
Total Area	<u>884.20 ha</u>

## 2 Overview Description

The Kitselas First Nation has established communities on the Gitaus, Kshish, Kulspai and Chimdemash reserves situated along the Skeena River just south and east of Terrace BC. Located within the Mountain Pine Beetle (MPB) zone there is a component of pine within the surrounding fuel types that is susceptible to attack. Mountain pine

beetle has been identified on overview flights conducted by the Ministry of Forests and Range (MOFR) in 2008. There are pine leading stands directly adjacent and west of the Gitau development and hemlock leading stands with a pine component surrounding the western and northern flank. Stands are mostly mature (greater than 100 years) with some second growth within the developed area. Some minor salvage work has been done adjacent to the community core as well as fuel modification treatments on the Kitselas canyon development and Gitau subdivision of IR # 1.

**Kitselas Reserve IR #1** is a modern urban development surrounded by forests and scattered rural acreages. Kitselas also contains buildings that provide community services to the members of the Kitselas First Nation.

**Kulspai Reserve IR #6** is set in a more rural urban development and has a scattered forest intermixed with residential development. There are scattered pine trees throughout this development that are approximately 80-90 years old.

**Chindemash and Kshish Reserves IR #2, 4 and 4A** are also rural development and are surrounded by mature coniferous and deciduous forests. There are pockets of pine leading stands within the reserve boundaries that are susceptible to MPB attack.

**Chindemash IR # 2A** contains one dwelling that is a full time residence as well as traditional fishing sites and fish processing areas. See appendix A: IR orthophotos.

## 2.1 Kitselas IR #1

The Kitselas IR 1 (Gitau) subdivision was established in the 1980s and is a modern, well planned residential area that boasts an administration and public services building as well as a newly completed fire hall. The subdivision currently has approximately 58 residential structures with developed lots prepared for an additional 40 to 50 houses. Roads, lot development and infrastructure services are in place for the planned housing construction, with building expected to occur over the next several years. From a fire smart perspective, the development at Kitselas is well planned. Streets have multiple entry and exit points, fire protection services are available and for the most part, there will be fuel free areas adjacent to the structures. The development has been planned to incorporate green space between the streets and back yards.

Gitau subdivision was developed from a heavily forested area where mature mixed coniferous and deciduous forest existed. Since the initial clearing, forest fuels have regenerated creating fuel loading between streets and adjacent to resident's houses. The fuel type is a C6 fuel type as described in the Canadian Forest Fire Behavior Prediction System (FBP), with a crown base height of less than 2 meters, ground fuels and dense thickets of regeneration. The surrounding forest fuels are C3 and C5 fuel types. These forest fuel types have very little ground or ladder fuels. There is also a large contiguous D1 fuel type located on low benches that are adjacent to the Skeena River and other lowlands (refer to Wild Fire Threat Rating Map Appendix 1). The subdivision is located on a high glacial fluvial plain above the Skeena River. The terrain slopes upwards toward the subdivision in all directions.

Fuel modification treatments were completed within the boundaries of Kitselas and Kshish IRs in 2009 under the Natural Resources Canada Federal Mountain Pine Beetle Program. Treatments were concentrated within the first 100 meters from existing structures. Total treated area was 7.2 hectares.

**Kitselas IR 1 (Gitaus)**



**2.2 Kulspai IR # 6**

Kulspai subdivision is an urban subdivision located south of Terrace on a fluvial flood plain of the Skeena River. This development is a high density residential subdivision that has a community, administration and health services buildings intermixed among the residential structures.

**Kulspai IR 6**



The Kulspai IR is surrounded by other high density residential and agricultural developments. The site is flat and has a significant deciduous component of cottonwood forests on three sides with the Skeena River on the north side of the development. This deciduous fuel type is a D1 fuel type as described in the Canadian Forest Fire Behavior Prediction System (FBP). There are small pockets of between 100 and 300 square meters of mixed coniferous pine hemlock and deciduous forest scattered through out the area. Approximately 150 meters in elevation above Kulspai IR #6 is a large contiguous fluvial plateau that contains 100 year old pine leading forests that are currently infected at low levels of MPB (less than 1%). These stands are considered to be at high risk to continued and ongoing attack. There is a significant understory of hemlock that is the climax forest for this ecosystem and is expected to eventually replace the pine overstory as forest succession progresses.

### 2.3 Kshish IR #4 and 4a

Kshish is a rural development situated approx four kilometers east of Terrace on the north side of the Skeena River. This development is an important summer fishing site that is inhabited both seasonally and year round. The structures range from cabins to permanently occupied residential properties. The lots are large and are intermixed within two different fuel types. The developed area is also located on a fluvial flood plain of the Skeena River. Fuel types are predominately D1 deciduous types within the IR and around the majority of structures, with pockets of pine leading and mixed coniferous/deciduous types located around two of the existing structures. Fuel modification treatments were completed within the boundaries of Kitselas and Kshish IRs in 2009 under the Natural Resources Canada Federal Mountain Pine Beetle Program. Treatments were concentrated within the first 100 meters from existing structures. Total treated area was 0.9 hectares.

#### Kshish IR 4

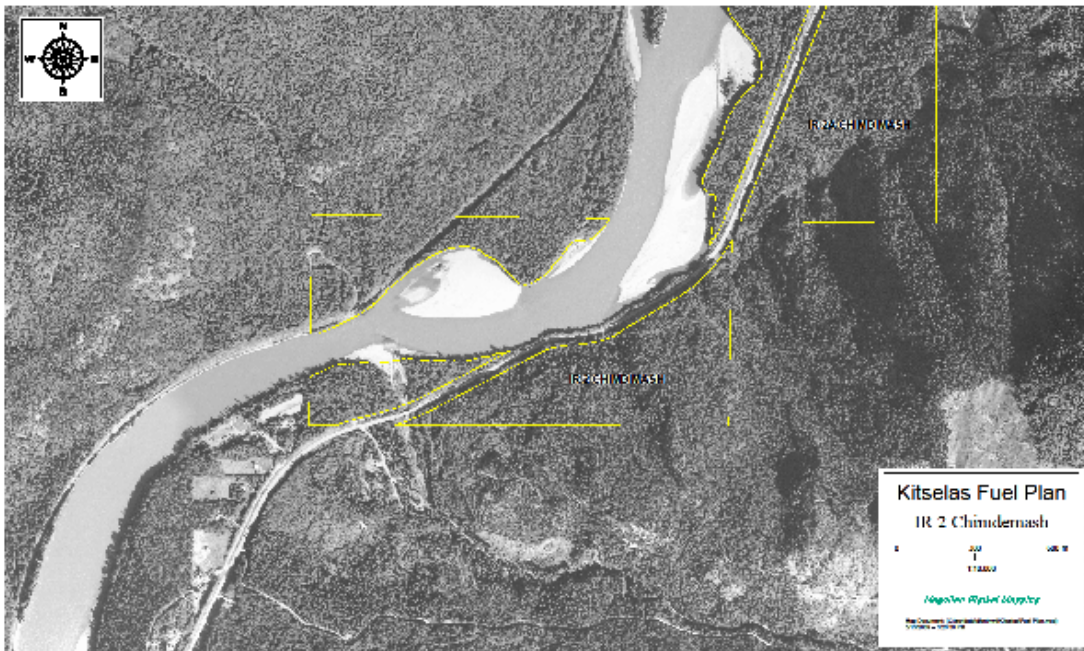


## 2.4 Chimdemash IR #2 and 2A

Chimdemash IR 2 is located east of Gitaus adjacent to Highway 16 on the north side of the highway bisected by the Skeena River. The site is mostly treed and does not have any structures located within its boundaries. The western edge abuts up against the small development of Chimdemash Loop where there are several residents established on small rural acreages. Many local fisherman access the Skeena River during the fire season via a walking trail through this IR.

Chimdemash IR 2A is directly east from IR2 and is on both sides of highway 16. This IR has one year round residential structure as well as a fishing cabin and fish processing site. The majority of this IR was harvested in the winter of 2010 using clearcut, small patch clear cut and selective harvesting methods. The remaining fuel types are comprised mostly of deciduous leading or a C6 immature coniferous type.

### Chimdemash 2



**Chimdemash 2A****3 Methodology**

The planning area was defined by the proponents as a radius within 2 km of the Kitselas IRs included in this plan. The base information collected during the CWPP report for the Regional District of Kitimat Stikine (RDKS) and the City of Terrace was used in the preparation of the Kitselas CWPP. (See Appendix 1 Wildfire Threat Rating Map)

The initial step in the RDKS and City of Terrace CWPP was to produce a base map from the Ministry of Forests and Range inventory data that delineated the attributes associated with forest cover. The forest cover mapping was used as the basis for establishing fuel types that would exhibit similar fuel characteristics and fire behavior. The planning area was divided into fourteen geographic **fire management units (FMUs** - refer to Key Map) that correspond to descriptions that are similar in terrain, aspect, development densities, protection services and topographic features. The base map contains

- Crown Land/Private Land
- Indian Reserves
- Roads/ Railways/Highways/Railroads
- Utilities/ Gas lines/Hydro lines
- Water bodies
- Forest cover
- Wildland Urban Interface (WUI) Threat Rating
- WUI assessment plot locations
- Fire protection boundaries
- Fire hall locations
- Fire hydrant and tanker re-load locations
- Municipality boundaries
- Historic fire start locations
- Planning boundaries
- Fire Management Units (FMU) - fourteen units

Six main fuel types were identified and assessed throughout the planning area and FMUs to identify not only the differences in fuel type hazards but to rate the effects of topography and development on wildland-interface hazards.

Plots were established in the field to measure the fire threat, and this, in conjunction with information on fuel, weather, topographical, and structural factors, was used to develop a Wildland Urban- Interface Wildfire Threat Rating. The plots were located in representative fuel types of various aspects, slopes, and urban development to determine the range of hazards that could be expected. The fuel types were first delineated using forest cover mapping. They were then coalesced to reduce the number and variation of categories into fuel types that would exhibit similar hazard characteristics and fire behavior. The forest inventory types were further confirmed and refined using local knowledge, satellite imagery, and orthophotos.

Following completion of the Wildland Urban-Interface Wildfire Threat Rating, the assessment locations were transferred to the base map and the results were summarized. This summary and analysis was used in discussions with stakeholders.

Then a review of the fire history and fire weather records was undertaken to assess the relative risk of historical conditions and, through an analysis of the data, determine when critical conditions occur. In addition, local by-laws, provincial statutes, relationships between agencies, and fire suppression preparedness levels were reviewed to confirm the ability within the planning area to prepare and respond to fires. Actions / recommendations for improvement are included within these sections.

Discussions with stakeholders occurred throughout the process to provide a perspective on what opportunities existed to reduce the risk of wildfires through the introduction of effective fuel management techniques, landowner education, implementation of Fire Smart principles and existing bylaws. The current level of fire preparedness and the communication between suppression agencies was also discussed as were the effects of the mountain pine beetle infestation and the predicted changes to fuel hazard in the pine leading forest that occur in the interface zone.

Based on stakeholder and threat rating information, options and recommendations for fuel management were developed. In conjunction with this process, a literature review was done of other completed Community Wildfire Protection Plans for communities such as Burns Lake, Revelstoke and Prince George. The outcomes of these reports were assessed for applicability to the RDKS and City of Terrace, and additional recommended treatments or actions were incorporated where appropriate.

Drafts of the RDKS and City of Terrace CWPP were provided and discussed with key stakeholders to ensure buy-in of recommendations and clarity of responsibilities. The Kitselas CWPP incorporates the final outcomes of the RDKS and City of Terrace CWPP.

Actions are identified which relate to the information provided in this report and are based on information gathered, interviews with local and regional experts, and local knowledge.

## 4 Description of Fire Management Units

The planning area for the RDKS and City of Terrace CWPP was divided into fourteen geographic fire management units (FMUs) that correspond to areas of similar terrain, aspect, development densities, protection services, and topographic features. The Kitselas CWPP includes portions of four of these FMUs (Gitaus/Kleanza, Old Kitselas, Gossen, Usk, and Queensway/Airport). Where the 2 kilometer planning radius contained small portions of an adjacent FMU that had significantly different characteristics and little or no effect on the relevant Kitselas IR, they were excluded from the Kitselas CWPP.

### 4.1 Gitaus-Kleanza FMU

This Fire Management Unit extends north from Kleanza Creek to the east side of Chimdemash Creek. Highway 16 transects this unit from north to south. The west side is bordered by the Skeena River and the east side by large forested mountains.

The development in this area ranges from high density residential in **Gitaus, IR #1** subdivision to small acreage residential at Kleanza Creek subdivision and the settlement of Usk on the Highway side.

Gitaus subdivision is a high density development that sits on a small plateau above Kitselas Canyon on the Skeena River. The main fuel type located around Gitaus is dense stands of predominately thrifty hemlock less than 100 years old with some small pockets of pine leading fuel types. There is significant brush and deciduous leading fuels to the north along the Skeena River and adjacent to Kleanza Creek in the south. Gitaus is bordered on the east by Highway 16.

Kleanza Creek Subdivision is bordered by Highway 16 on the west and thrifty hemlock or pine leading fuel types surrounding or intermixed amongst the acreages. The subdivision is located at the base of a large mountain which is forested in similar fuel types.

On the Kleanza Forest Service road which is adjacent to the Kleanza Creek Subdivision are a few larger more dispersed developments with larger parcels of cleared land. These properties are intermixed and surrounded by the same fuel types of thrifty hemlock or pine leading forests.

Usk is an old community of medium density structures concentrated around the ferry crossing on the highway side of the Skeena River. Bordered by the Skeena River on the north and west flank, the main fuel type is deciduous leading. Across the highway there are a few developments as far as Chimdemash Creek. These developments are sparsely located, directly adjacent to the highway, and are surrounded by thrifty hemlock, second growth hemlock-balsam and some isolated patches of old growth hemlock.

There is an extensive history of harvesting activity upslope on Singlehurst Mountain that has created a second growth hemlock-balsam fuel type. Intermixed and further above the harvested area is old growth hemlock-balsam.

Kleanza Creek, Gitaus and Chimdemash Creek are within a fire protection zone. Services are provided by the Thornhill Volunteer Fire Department which has a satellite station at **Gitaus on Kitselas IR#1**. The lone dwelling on Chimdemash IR # 2A located on the northern end is outside the fire protection area of the Regional District.



#### 4.2 Old Kitselas FMU

The Old Kitselas Fire Management Unit is bordered on the west by the height of land with the North Terrace FMU, the Skeena River to the south and east and Alpine to the north. The development in this FMU is low density rural acreages that are primarily located along the river and railway tracks with some scattered development upslope near the end of the old Kitselas Road.

The development on the floodplain and the site of old Kitselas, is primarily located in deciduous leading fuel types with the upslope properties intermixed with pine leading or second growth fuel types. **Kshish IR #4 & 4a is within the FMU.**

This area is not within a fire protection zone.

#### 4.3 Terrace Airport – Queensway FMU

The Terrace Airport/Queensway Fire Management Unit is defined as the area west of the Highway 37 and North of Lakelse Lake. The unit includes the rural settlements of Queensway, **Kulspai IR #6**, the Matson Road area and the airport plateau.

The settlement along Queensway Drive includes a range of development from high density to an intermix of less than 1 structure per hectare. Most of the high density is established along the Skeena River corridor and the upland subdivision of Churchill Drive. The Matson/ Farkvam Road area and west primarily contains development primarily in the less than one structure per hectare category.

Fuel types include a significant band of low hazard deciduous along the Skeena River portion and the Queensway Drive area to more concentrated thrifty hemlock leading mixed stands in the Matson Road Area

The Airport Plateau contains the airport development lands and utility right of ways, including the Kitimat Spur extension of the Canadian National Railway. This area is comprised of predominantly lodgepole pine and hemlock forest of 90-100 years of age with a hemlock understory representing all three height class layers.

The Thornhill Volunteer Fire Department provides fire protection services to some of the areas outside the airport core lands while the Terrace Fire Department provides services within the Terrace-Kitimat Airport Core lands.

Fire hydrant development extends down Queensway Drive and the Churchill Road Subdivision including **Kulspai Reserve #6**. No hydrant services are located within the Matson Road area; however, a water source has been developed at the end of Munson Road for reloading water tankers.

#### 4.4 North Usk FMU

This Fire Management Unit is defined by the avalanche slide tracks in the south that separate this unit from the old Kitselas FMU to Shannon Creek in the north and the Skeena River to the east. The mountain above Usk is extremely steep and rises quickly to an alpine forest cover.

The development is primarily medium density and is situated along the floodplain. The north axis of the development is intermixed and surrounded by a large predominately pine leading fuel type. This type is upslope of the development. To the west is a series of slide tracks and deciduous types intermixed with fingers of old growth hemlock-balsam. The southern and eastern edge is bordered by the Skeena River and is directly across from Highway 16.

This area is not within a fire protection zone. Portions of undeveloped areas of **Kitselas Reserve #1** across from the Gitau subdivision are within this FMU.

## 5 Wildland and Urban Interface Wildfire Threat

Plots were established in the field to measure fire threat. This information, in conjunction with information on fuel, weather, topographical, and structural factors, was used to develop a Wildland Urban-Interface Wildfire Threat Rating. There were thirty-three fuel management plots located throughout the RDKS planning area. The plots were established and recorded following the procedures of the *Wildland Urban Interface User Guide*. Summaries of the wildfire threat hazard ratings are provided in Appendix 2.

The result is the map in Appendix 1 that not only illustrates the various wildland urban interface wildfire threat ratings, but is also correlated to the wildfire intensity rank that could be expected in those fuel types.

The entire planning area represented by the thirty three fuel assessment plots indicate that the highest wildfire threat rating that occurs in the planning area is **‘Moderate’**.

### 5.1 Rating Factors

The fuel types found in the planning area exhibit a wide range of attributes that describe the potential wildfire urban interface hazard as assessed using the required assessment procedures. The rating system assesses four main components:

- Fuels
- Weather
- Topography
- Structural

### 5.2 Fuel Factors

Fuel as a factor is related to the type of forest that exists in a given area. The five fuel types identified in the FMUs are such that they range from a low to a moderate wildfire threat rating. As fuel and development are the only two factors in the assessment equation that can be modified, it indicates that fuels alone do not exhibit a significant fire hazard to development.

**Table 1: Table of Fuel type / Hazard Summary for Planning Area**

Fuel Type	Cultivated/ cleared	Fuel Type 1 WUI HAZ D1	Fuel Type 2 WUI HAZ C5	Fuel Type 3 WUI HAZ C3	Fuel Type 4 WUI HAZ C6	Fuel Type 5 WUI HAZ C6	Total Ha
<b>WUI Hazard</b>	<b>Low</b>	<b>Very low- Moderate</b>	<b>Low- Moderate</b>	<b>Moderate</b>	<b>Moderate</b>	<b>Moderate</b>	
<b>Area (ha)</b>	2188	2751	4282	1103	1665	1021	<b>13010</b>

*WUI HAZ = Wildland-Urban Interface Hazard Threat Rating*

*C3 = Pine leading; C5 = Mature Hemlock-Balsam; C6 = Immature Coniferous; D1 = Deciduous*

The Table 1 summarizes the areas of the five fuel types found and the Wildland-urban interface (WUI) threat rating. These fuel types total 13,010 hectares within the planning area. Total fuel modification within the interface zone through timber

harvesting is expected to be 399 hectares over the next five years, and will be distributed across these fuel types. A summary of Land ownership is included with the Wildfire Threat rating map in Appendix 1. Of the total planning area, 942 hectares is IR (7 %), 1774 hectares is private land (14%), and 10,296 hectares is Crown Land (79%).

All of the WUI wildfire threat data collected indicated a similar trend with the forest fuels in the planning area. It is apparent, given our climate, that there is very little forest floor debris that contributes to an increased threat rating. The small and large debris quickly rots in our coastal influenced climate and does not create a build up of fuels that would contribute to fire intensity.

Due to our fuel types, crown closure, and ecosystems, we also experience a low availability of flammable surface vegetation as fuel. We consistently have a low rating in this category as the majority of the ground cover is moss or herbs.

The other value that is consistently low is the amount of standing dead and down coniferous forest with or without foliage. This factor may change in time if the mountain pine beetle infestation is successful in reaching epidemic levels (see section 6.3.1 below).

Some of the fuel factors that have an impact on moderating our wildland urban interface wildfire threat rating are:

- Consistently average duff depths rating.
- Consistently lower than average vegetation fuel.
- Consistently lower than average fine and large woody debris continuity rating.
- Consistently lower than average coniferous crown base height rating.
- Consistently lower than average ranking for coniferous forest health rating.

The fuel types were also roughly categorized to reflect the fuels as described in the Canadian Forest Fire Behavior Prediction System (FBP). The fuels described in the FBP system can aid in assessing the following factors

- The critical fire weather conditions that need to exist for high intensity fires in a particular fuel type.
- The frequency of those critical conditions existing for each fuel type.
- The timing of when those conditions exist.
- Historical wildland forest fire starts and causes.
- The timing of when those fire starts occur.
- The trend of historical fire starts during critical fire weather conditions.

Through this analysis a correlation can be made to the risk of a fire start during critical conditions, as well as an assessment of current suppression preparedness levels when those conditions exist. The following sections describe the five main fuel types found in the planning area.

### 5.2.1 *Deciduous leading forest fuels*

Deciduous leading forest fuels are found along the active floodplain in valley bottoms, rivers and creeks and in some areas that had been heavily disturbed from fire or have had an increase in the water table. They provide natural fuel breaks and differing fire behavior characteristics than the other four main fuel types. The deciduous leading fuel type provides the lowest overall WUI threat rating on the wildfire urban interface hazard rating. This fuel type is characterized

by fire behavior as a D-1 fuel type as defined in the Canadian Forest Fire Behavior Prediction System

*Deciduous leading - D-1 Fuel Type (Plot 5)*  
*photo: T. Jobb*



### 5.2.2 *Second growth hemlock-balsam fuels*

Second growth hemlock-balsam fuels are primarily the result of over 80 years of harvesting activity of which the last 50 years could be considered heavy activity. Located predominately on the valley floor and mid-slope elevations, some activity has reached just below the alpine fuel types. They are mostly made up of hemlock-balsam regeneration and range in age from recent harvesting to 80 years plus. This fuel type commonly has a shorter crown height and is more susceptible to temperature fluctuations, precipitation, humidity changes and the effects from wind. Fire behavior in this fuel type would exhibit higher intensities and rate of spreads than in the old growth hemlock-balsam fuel types. Use of this fuel for strategic fire control could aid in suppression actions (e.g. by taking advantage of differing crown heights from adjacent fuels). This fuel type is characterized by fire behavior as a **C6** fuel type as defined in the Canadian Forest Fire Behavior Prediction System.

*Second growth hemlock-balsam - D6 fuel type (Plot 28)*  
*photo: T. Jobb*



### 5.2.3 *Old growth hemlock-balsam fuels*

Old growth hemlock-balsam fuels are found primarily away from the valley floor on the mid to upper slope elevations. There are small areas intermixed within the developed areas along the valley bottom but there are no large areas of contiguous fuel. This fuel requires above-average fire weather conditions to

create high intensity fires that can affect the difficulty of control for suppression forces. This fuel can act as a good fuel break from other fuels as there can be higher humidity levels and lower temperatures within the associated canopy. Other than deciduous leading fuels, this fuel type will exhibit much lower fire intensity with different spread rates than adjacent valley floor fuels. Use of this fuel for strategic fire control could aid in suppression actions. This fuel type is characterized by fire behavior as a **C5** fuel type as defined in the Canadian Forest Fire Behavior Prediction System



*Old growth hemlock-balsam - C5 Type Fuel (plot 20)*

*photo: T. Jobb*

#### 5.2.4 Pine leading fuels

Pine leading fuels are located primarily on the benches in the valley bottom and on steep, rocky outcrops or knolls. Burned in the 1920s, the area that the pine leading fuels occupy is diminishing due to a significant amount of development on sites where pine occurred.

These fuels are primarily a pine leading stand with an emerging or well established understory of western hemlock. Given high or extreme weather indices, this fuel type and its proximity to development could pose the greatest control difficulties of all the local fuel types. The current mountain pine beetle infestation may have an impact on the future hazard of this type by modifying the fuels (see section 4.2.7). Other fuel types, fuel breaks such as right-a-ways, rivers and topography breaks would anchor control lines for this fuel type. This fuel type is characterized by fire behavior as a **C3** fuel type as defined in the Canadian Forest Fire Behavior Prediction System



*Pine leading - C3 Type Fuel (plot 14)*

*photo: T. Jobb*

### 5.2.5 Thrifty hemlock-balsam fuels

Thrifty hemlock-balsam fuels are found on sites that either have a fire history or sites from some of the first logging over 80 years ago. This stand usually has a very dense canopy with very little underbrush or herbaceous layer and commonly a 5-10 percent deciduous component of birch and/or aspen. This type found primarily on the valley floor, extends upslope in a few places such as Kleanza Creek and Copperside Estates. The expected fire intensity would be somewhat less than that found in the pine leading stands primarily due to being found on moister sites and containing a deciduous component. This fuel type is characterized by fire behavior as a **C5** fuel type as defined in the Canadian Forest Fire Behavior Prediction System

*Thrifty hemlock-balsam - C5 Type  
Fuel (plot 32)  
photo: T. Jobb*



### 5.2.6 Developed agriculture and swamps

This type includes urban and agricultural development as well as some of the larger swamp systems. As these polygons are essentially the fuels that we wish to protect (i.e. developments), they also represent a fuel type that forms a control point due to changing forest cover, intermixed fuel breaks and different fire behavior. The swamp systems delineated also form areas for control points and the opportunity to take advantage of varying fire behavior. These types range in size from very large (City of Terrace) to small scattered development throughout the planning area. Large swamps are located between the developments of Jackpine and Thornhill as well as between Jackpine and Lakelse Lake.

## 5.3 Weather Factors

Weather as a factor can not be altered. Weather is expressed as a numerical rating of the surrounding local fire weather and historical fire starts. The Terrace area is situated in a moist, coastal influence zone, and therefore has a very low rating in this category

Low historical fire weather and fire start history consistently results in the Terrace area having the lowest threat rating attainable. This is discussed further in the section on fire weather.

## 5.4 Topography Factors

Topography is another factor that can not be changed. Extreme wildfire threat ratings are related to south aspects with steep slopes and gullies. The primary development

within the CWPP planning area is located on flat benches or gentle slopes indicating a low to moderate influence on the wildfire threat rating. An overview of the local development shows that most occurs on the valley bottom or on river terraces or benches with some development on gentle rising slopes such as the upper portion of the Kleanza Subdivision.

Developed areas that are situated on flat ground consistently have a lower wildfire threat rating. Increased fire behavior would be expected if a developed area is located on a west or south aspect on steeper slopes, with gullied terrain. In some cases the topographic ratings were increased to a high rating in fuel types found on steeper south aspects with gullied terrain. This rating accounted for 25% of the WUI wildfire threat rating plots established (see Appendix 2).

Topographic fire breaks such as ridges, drainages, and mountains, combined with a mosaic of fuel types provides natural defense lines to prevent wildland fires from spreading into the interface. The general topography of the Terrace area is favorable for control efforts to contain fires to one FMU.

## 5.5 Structural Factors

Structural factors relate to the proximity of structures to fuel areas, and the types of structures/ development. This category had the greatest variation in ratings which ranged from low to moderate-high, which is a normal characteristic of semi rural development, where structures are often located next to forest fuels or within interface areas. Modification of this factor can be achieved when planning for new development or replacing existing structures.

## 6 Fire Weather and Fire History

### 6.1 Fire Weather

Terrace and area is situated within the Coastal Western Hemlock (CWH) Biogeoclimatic Zone. Summer and winter climates are moderated by weather patterns from the Pacific Ocean, where extreme temperatures, when they occur, are short lived.

The weather patterns and historical fire weather place this planning area as one of the lowest weather rating areas in the province, when using the wildland urban interface wildfire threat worksheet.

A summary of historical fire weather and fire starts has been collected from the Ministry of Forests and Range protection division data base. The methodology was to set parameter thresholds of conditions that would cause high intensity fires in excess of 4000 kW/m. This threshold is widely understood as the condition when a fire will become extremely difficult to control. This is when control tactics such as direct attack are not feasible, and large landscape characteristics are used in control through back burning.

For each fuel type encountered in the planning area, fire intensities will reach this critical point at different thresholds. Figure 2 summarizes these thresholds from the historical fire weather data for three different fuel types. There have been no adjustments for factors such as wind, slope, aspect or time of day to the weather indices used.

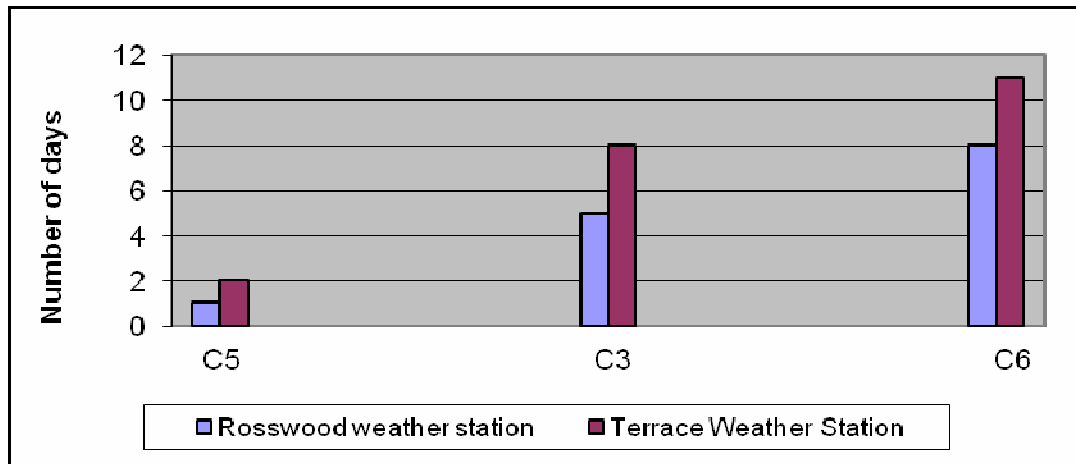
Although it is possible to refine the prediction of fire behavior based on the above variables, it would be difficult to predict or plan for the multitude of variations experienced through out the planning area. Therefore the threshold levels will most likely occur more often than illustrated due to an increase in the Fine Fuel Moisture codes because of the time of day, allowances for slope or aspect and changes to wind speeds. The three types that have been compared are the C5 fuel type (mature hemlock balsam stands), the C3 fuel types (pine leading stands) and the C6 fuel type (coniferous plantation with crown base heights > 2 meters). The data illustrates that there is an average of 12 critical days per year where high intensity fires could occur in the C6 fuel type. The critical days for a pine leading type fuel (C3) is lower at approximately 8 days per year and less than 2 days per year in the mature hemlock balsam forests (C5) (Figure 2).

Critical fire weather occurs sporadically and must be considered when promoting or planning large scale fuel management programs and the associated costs.

However, elevated risk conditions can take place when a weakening of a significant high pressure system can cause strong inflow winds from the Pacific to occur. Although this change usually brings moist and cooler air, there is a critical period when the winds can create conditions favorable to extreme fire behavior.

History has shown that such fires will make the biggest gains during the initial period, as once the new front is established, the winds will decrease, the humidity will rise and the air temperatures will lower. Fire intensity will respond accordingly.

**Figure 2: Graph of number of average annual days when fire weather thresholds exist for high intensity fires (greater than 4000kw/m) by fuel types described by the FBP system.**



C3 = Pine leading; C5 = Mature Hemlock-Balsam; C6 = Immature Coniferous

(Source: Ministry of Forest and Range.)

Another high risk condition that exists in our fuel types is the time prior to green up in the early spring of each year. This is when there is more surface vegetation available for easy ignition at a relatively fast rate of spread. The significant advantage for suppression efforts on this type of fire is that control is easier compared to late spring or summer conditions. Although a fire may ignite easily and may spread fast in fine fuel types, it does not burn as intensely at this early time of



year due to the lack of time that large and medium size fuels have had an opportunity to dry. This “spring “ hazard would be found in lighter fuels with ground cover such as plantations, cultivated fields and forested areas with a surface vegetation or forest floor fuels such as small woody debris or dry leaves.

Late spring, specifically the month of June, is a time when we can expect an increase in fires starts, and elevated fire weather conditions could support large intense fires. June is also the month when most cross over days occur, as a result of the longer days leading up to summer (cross-over days are when humidity levels are lower than air temperature).

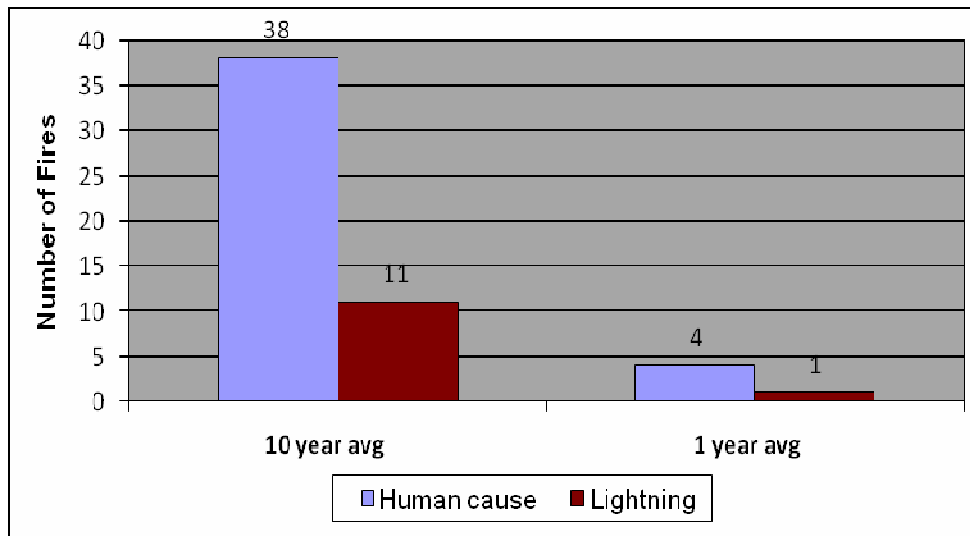
## 6.2 Fire History

Terrace and the surrounding area have experienced significant climatic changes over the past two decades. As global warming effects become more apparent, changes in weather patterns will have a significant impact on wildland fires and their behavior.

The annual average number of fires that start in the Kalum Forest District is twenty fires per year. Approximately five of these fires start within the Wildland Urban Interface. Of these five wildland interface fires per year, approximately four are human caused and one lightning (Figure 3). In addition to the wildland fires, the Thornhill Fire Department responds to approximately 14 fires per year that are not accounted for in the Ministry of Forests and Range statistics. The Thornhill Fire Department fires are usually associated with back yard fires and grass fires.

The fires that occurred in the Kalum Forest District were plotted to determine the occurrence of both lightning and man caused fires in or adjacent to the planning area. It is important to quantify not only the fire intensity one could expect in our fuel types, but also the risk and history of actual fire starts.

**Figure 3: Graph of Number of Wildland-Urban Interface Fires**



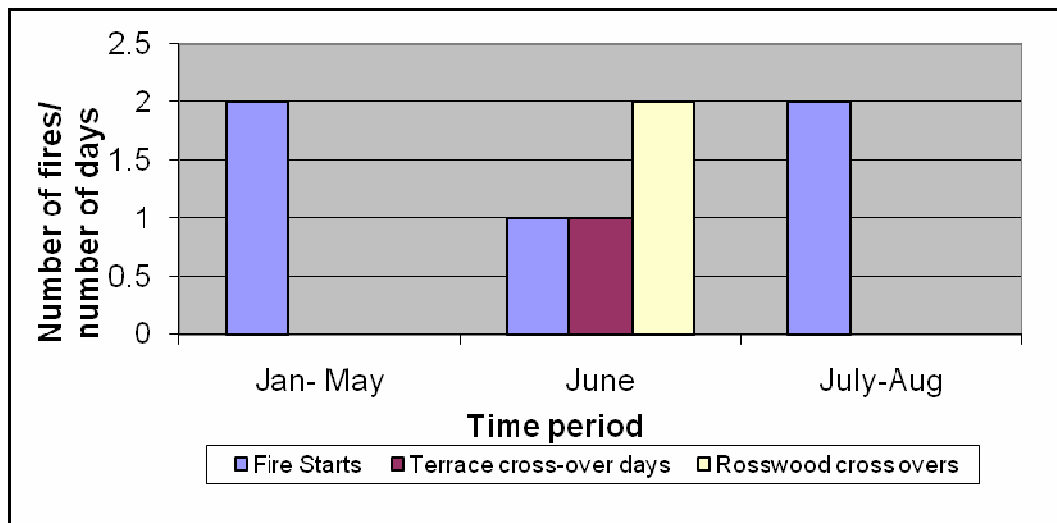
(Source: Ministry of Forest and Range.)

The majority of the fire causes are abandoned camp fires, children/juveniles or lightning strikes.

For a breakdown of historic fire starts and specific causes refer to Appendix 3. Fire history data was also used to correlate fire starts that occur during critical fire weather conditions such as “cross over days” when humidity levels are lower than air temperature. Figure 4 illustrates that cross over days and fire starts occur mostly in the spring, specifically June. Fewer fire starts and cross over days occur after June 30<sup>th</sup> when more intense fires could be expected due to long term drying trends.

- Cross over days are when extreme fire behavior and intensity can result due to the air temperature being higher than the air humidity
- 85% of Cross Over days occur before June 30<sup>th</sup> (Spring Hazard)
- Fire starts occur on average five times per year
- Three of the average annual fire starts occur prior to the end of June

**Figure 4: Graph of Historic annual fire starts compared to historic annual cross over days**



(Source: Ministry of Forest and Range.)

## 7 Important Forest Health Issues

Forest health issues in the Kitselas CWPP planning area include Mountain Pine Beetle, windthrow, and other forest pests and pathogens.

### 7.1 Mountain Pine Beetle influences

#### 7.1.1 Changes to fuels

Although mountain pine beetle (MPB) has long been found in the local forests in endemic populations, the area has not seen a significant outbreak since the early 1980s. At least, that was the situation until 2006 when the beetle has been found in increasingly greater numbers. This increase was the result of a weather system from the east that carried in large amounts of mountain pine beetle at precisely the time of their flight<sup>1</sup>.

The mountain pine beetle affects the pine forests which happen to be one of the predominant fuel types located in or around the wildland urban

<sup>1</sup> Aaron Benterud, Ministry of Forests and Range. Personal conversation, November 13, 2008

interface. The largest tracts of pine forest are on the airport industrial lands, Jackpine flats, Thornhill, Terrace bench, Terrace Mountain, Rosswood, old Kitselas, Gitaus and Kleanza / Usk areas. This fuel type comprises 1191 ha within the Kitselas planning area, but more importantly is a significant feature of the forest fuels found close to developed areas.

The approach by staff in the Ministry of Forests and Range is to monitor through aerial surveys the spread of the infestation. The exception to this is direct ground assessments and control strategies (fall/burn/harvesting) in and around the Rosswood area. This strategy is an attempt to stop the northern advance of the mountain pine beetle into the Nass valley.

Any measures to apply beetle control actions such as the fall and burn in 2007/2008 around the Terrace area are now generally considered ineffective. However, the City of Terrace has implemented a program to identify and remove beetle infested trees that may pose a fire or safety hazard within and directly adjacent to parks, green spaces and trails in the municipality.

It is interesting to note that the beetle infestation has not become catastrophic and that the pine leading stands remain infested but not as severe as predicted. The thought is that our moist climate could actually inhibit the life cycle and reproduction of the mountain pine beetle. Differences in the species of pine found here compared to the interior, as well as our stand compositions could also be contributing factors

The next few years should provide a clearer picture on the severity of this outbreak and the damage caused.

#### *7.1.2 MPB effects on Wildland-Urban Interface Fire Hazard*

Depending on the severity of the MPB outbreak, a complete attack such as that experienced in the interior of British Columbia will change the hazard of this fuel type. The type will go from green foliage to standing red. This change in foliage will immediately increase the flammability of the fuel type and the expected fire intensities. Fires under certain weather conditions that would have normally produced moderate fire intensities with somewhat predictable behavior would react with extreme behavior and high intensities. These are the fires that are extremely difficult to control with suppression forces, other than with very limited action or strategic defenses.

The red and dead phase of the mountain pine beetle infestation will change to a grey phase in two years, where the hazard would previously have been predicted to drop due to the loss of needles. However, the experience of fire specialists within the MOFR on fires in the pine forests of the Interior indicates that this is not the case. Grey phase fuel types in the Interior have produced crowning fires of very high intensities due to the amount of dry/dead fuel available. There is thought that as pine goes grey and falls down, there could be a significantly higher hazard than the current "green" stage<sup>2</sup>. If this occurs, the need to remove or modify these fuel types will be all the more important.

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<sup>2</sup> Brad Martin, Ministry of Forests and Range. Personal conversation, December 16, 2008

7.1.3 *Windthrow*

With the exception of pine leading stands where fire plays a key role, the majority of disturbances causing stand succession are windthrow events. The Terrace area is located within the main river and inlet valleys of the Pacific North Coast, where high winds are a common occurrence. Fuel modification treatments where removal of the stand canopy is prescribed should consider the prevailing winds, type and size of treatment as well as boundary location. Where a prescribed fuel management treatment could pose a risk from windthrow, a windthrow risk assessment should be carried out while developing the fuel treatment prescription and prior to implementing the treatment.

7.1.4 *Forest Pests and Pathogens*

Aside from the Mountain Pine Beetle Infestation, there are limited forest pests or pathogens that have significantly impacted the regional forests in terms of changes to fuel loading and the resultant effects on wildfire behavior and hazard. Any fuel treatment prescription should evaluate the possibility for root rots, such as tomentosus and annosus root disease as well as defoliators such as the hemlock looper.

As well, the maintenance of species diversity should be considered to lessen the impacts of pests and pathogens on forest health and to mitigate the potential effects of climate change.

**8 Proposed Treatment Units /Estimated Budget**

The planning area was assessed for potential fuel management projects that would reduce the chances of a wild fire from starting and or the intensity of a wildfire if one did occur. This is primarily accomplished through fuel modification which can affect fire behavior. The areas were assessed in conjunction with the MOFR fuel management specialist and projects were identified that would have a positive impact on reducing the devastating effects of wildfire on life and property. (Refer to wildfire threat map Appendix 1 for proposed treatment locations). Priority treatment areas were based on proximity to development, potential of fire starts, adjacent fuels, values at risk and expected fire behavior and direction of spread. The Table in Figure 5 summarizes the proposed treatment areas.

**Figure 5: Table of Proposed Fuel Treatment Projects**

Treatment #	Est Area ha)	Prescribed Treatment	Treatment Method	Priority of Treatment	Protection criteria	Resource issues
1	0.25	G/L/T	Hand	7	Residential/ Life/ Property	Adjacent to hwy/gas line
2	2.5	G/L/T	Hand	2	Residential/ Life/ Property	Adjacent to hwy/gas line
3	0.5	G	Hand	3	Residential/ Life/ Property	Adjacent to hwy
4	7.0	G/L/T	Hand	1	Residential/ Life/ Property	Within a provincial park
5	2.0	G	Hand/Machine	6	Residential/ Life/ Property	Adjacent to hwy gravel reserve
6	1.5	G/L/T	Hand	4	Residential/ Life/ Property	Adjacent to homeowners
7	0.75	G/L/T	Hand	5	Residential/ Life/ Property	Adjacent to homeowners and hwy

## 8.1 Treatment Area Descriptions

The following provides a brief description of the proposed treatment, location, proximity to development and infrastructure and fuel types.

### Treatment Area #1

Treatment Area #1 is a five meter wide by approximately 500m long strip directly adjacent to a Hemlock leading type that contains a dominant pine overstory. The proposed treatment would remove the ground/ladder fuel by pruning and thinning this area that is directly adjacent to the highway right-of-way. Being directly adjacent to the highway right-of way, there is a possibility of a grass fire occurring that could reach the timber edge, and use the ground/ladder fuels to gain access into the crowns of the standing timber. This type is contiguous to Treatment Area #2 and directly adjacent to the eastern flank of Kitselas IR#1, Gitaus subdivision

### Treatment Area #2

Treatment Area #2 is a five meter wide strip by approximately 700 meters long directly adjacent to a Pine /Hemlock leading type. Mountain Pine Beetle is found within this type. The proposed treatment would remove the ground/ladder fuel by pruning and thinning this area that is directly adjacent to the highway right-of way. Being directly adjacent to the highway right-of way, there is a possibility of a grass fire occurring that could reach the timber edge, and use this fuel type to gain access into the crowns of the standing timber. This type is contiguous to Treatment Area #1 and directly adjacent on the eastern flank of Kitselas IR#1, Gitaus subdivision.

### Treatment Area #3

Treatment Area #3 is a 0.5 ha area of blowdown located adjacent to the access road leading into the Gitaus subdivision. This blowdown has seen fire wood cutters salvage a portion of the blown down trees. There remains an accumulation of ground fuels that should be removed. This treatment area is within 200 meters of the Kitselas IR boundary.

### Treatment Area #4

Treatment Area #4 is a hillslope directly below the rural development of the Kleanza Creek subdivision and within/adjacent to Kleanza Provincial Park. This fuel type is comprised of mixed forests and pine or hemlock leading types. There is a significant amount of Mountain Pine beetle infected trees across this hillslope. Proposed fuel treatment would be to modify ground and ladder fuels within 30 meters of trails and access roads within the park. Hillslope fuel treatment would be difficult and costly to accomplish. Risk of a fire start by park patrons and the public is a concern. Referral and authorization by BC Parks would need to occur during the development of the prescription and before any work commenced.

### Treatment Area #5

Treatment Area #5 is a 2.0 ha area of blowdown located adjacent to the north flank of the Gossen Creek subdivision. This blowdown has seen local fire wood cutters salvage a portion of the blown down trees. There remains an accumulation of ground fuels that should be removed. This treatment area is located within a predominately hemlock fuel type on a "dry" fluvial terrace. Large fuels could be accumulated and piled for use as firewood. A combination of machine and hand crews would be the most effective method of modifying this fuel type. Notification

and involvement of homeowners would be prudent prior to implementation of any fuel treatment activities. Use of the Ministry of Transportation and Highway (MOTH) gravel reserve area for staging and fuel disposal would be a benefit to the project. Authorization with MOTH would need to be obtained prior to use of this area.

Treatment Area # 6

Treatment Area # 6 is a 30 meter wide by 500 meter long area directly adjacent to the northern boundary of the Gossen Creek subdivision. This area is comprised primarily of a dense immature stand that abuts directly up to rural residential properties. The prescribed treatment is to reduce stand densities and remove ground and ladder fuels. This area will also showcase fire smarting principles to local residents and could provide an incentive for direct treatment by homeowners on their properties. Notification and involvement of homeowners would be prudent prior to implementation of any fuel treatment activity in this area.

Treatment Area # 7

Treatment Area # 7 is a 0.75 hectare predominantly hemlock fuel type that is adjacent to homes on the eastern edge of the Gossen Creek subdivision. This area has moderate ground and ladder fuel concentrations. The adjacent highway right-of-way contains a grass fuel type that could act a possible ignition source for this fuel.

8.2 Estimated Fuel Treatment Budget

The following is an estimated budget for completing the proposed activities. Field assessment and layout will determine actual budget estimates.

**Figure 6: Table of Costs for Proposed Fuel Treatment Projects**

Treatment #	Est Area (ha)	Prescribed Treatment (Ground, Ladder, T)	Treatment Method	Prescription Cost * (\$)	Hand Cost (\$/ ha)**	Machine Cost (\$/ ha)***	Total estimated cost
1	0.25	G/ L/ T	Hand	600.00	7000.00		2350.00
2	0.35	G/ L/ T	Hand	Included in 1 above	7000.00		2450.00
3	0.5	G	Hand	600.00	7000.00		4100.00
4	7.0	G/ L/ T	Hand	3000.00	10000.00		73000.00
5	2.0	G	Hand/ Machine	1400.00	5000.00	3000.00	17400.00
6	1.5	G/ L/ T	Hand	2500.00	9000.00		16000.00
7	0.75	G/ L/ T	Hand	Included in 6 above	9000.00		6750.00
<b>Total</b>	<b>11.35</b>						<b>\$122050.00</b>

- \* Estimated Prescription costs include prescriptions/assessments as required,, stakeholder consultation and permitting/authorizations
- \*\* Estimated Hand Costs include use of chippers
- \*\*\* Estimated Machine Costs are for hydraulic log loader

## 9 Fire Preparedness and Prevention

### 9.1 Fire Smart Program – Fire Smart Manual

The Fire Smart Manual is available on line at the Office of the Fire Commissioners website at [www.pssg.gov.bc.ca](http://www.pssg.gov.bc.ca).

This manual provides details in discussions on

- hazard assessments for your property
- solutions and mitigation actions
- emergency measures
- wildland urban interface training
- communications and public education
- land use planning

The low density development that occurs in the interface zone (a large component of the planning area), puts these areas at particular risk to wildfire and the risk of structural fires entering onto the wildlands. The potential damage caused by wildland-interface fires to homes and property can be reduced by employing the basic components of a Fire Smart program.

It is for these reasons “**Fire Smart**” principles should be promoted to the land owners and local governments should require that Fire Smart principles be considered for new development or planned expansion of existing developments.

Fire suppression agencies, local governments and landowners all have a role to play in protecting our community. The implementation of Fire Smart programs will provide the most cost effective impact on reducing losses and damage from wildfires.

UBCM Operational Fuel Management Treatments should include Fire Smart education and delivery as an eligible project. Delivery of this material and buy in from landowners has the potential to result in more effective fuel management treatments directly adjacent to structures and development, providing defensible positions for suppression forces.

This approach has been discussed with representatives of the Office of the Fire Commission (OFC), the provincial authority on the Fire Smart program. Under the current OFC budget, the primary delivery mechanism for Fire Smart is through the production of educational material (pamphlets). The OFC are pursuing funding for the training of suppression forces in WUI fires, but at time of writing this report, the OFC has no avenue for the training of suppression agency personnel in the delivery of material to landowners.<sup>3</sup>

*Fire Suppression agencies, local governments and land owners all have a role to play in protecting our communities. The implementation of the Fire Smart Program will provide the most cost effective impact on reducing losses and damages from wildfires.*

### 9.2 Resource Issues and Operational Constraints

Local resource values important to the Kitselas First Nation include sites of traditional, cultural and historical significance. Primary to these values are old village sites concentrated within the vicinity of Kitselas Canyon and Old Kitselas. These sites represent some of the best examples of the cultural history of the Kitselas First Nation. As part of a joint development with parks Canada, the Kitselas Canyon area is a modern day show case of the Kitselas First Nation Culture.

<sup>3</sup> Dave Ferguson, Office of the Fire Commissioner, personal conversation, February 26,2009

Other areas of significant traditional use include a multiple of known fishing sites, where fish is gathered and processed for sustenance and cultural purposes. Lands identified within this plan represent only a small portion of the Kitselas Traditional Territory. Within the territory numerous archeological sites in the form of culturally modified trees, food cache pits, house pits, middens and artifacts have been found that represent the history of the Kitselas.

An archeological overview assessment has been completed for the planning area which identifies areas by probability of archaeological significance. All treatment areas will need to be assessed for the presence of archeological resources prior to any fuel treatment activities. Proposed treatments that potentially could impact archaeology resources will need to comply with regulations pertaining to the assessment and protection of those resources.

The Kitselas CWPP planning area contains a significant portion of private land within the wildland interface zone (1774 hectares) that will restrict the amount of fuel management activities that can be carried out. The private land is mostly comprised of rural acreages. The remaining areas outside the reserve boundaries and private land are crown land, utility right-of-ways and provincial parks. Vacant Crown land would lie within the operating Forest Licenses of Kitselas Forest Products and Coast Tsimshian Resources. Fuel treatment prescriptions should consider licensee operating plans prior to implementation. Proposed harvesting areas from these licensees (399 hectares) have been identified on the wildfire threat rating map (see Appendix 1 for area summaries).

All fuel management activities will need to conform to riparian management guidelines, and management of wildlife habitat for Grizzly Bear, Moose and Mountain Goat. The Kitselas Forest Products Forest Stewardship Plan will direct higher level resource issues for prescriptions developed for fuel management activities. The Kitselas FSP can provide reference information to the prescribing Forester on Visual Quality Objectives, Domestic water use (intakes/diversions), and proposed water supply areas such as Skovens and Kleanza creek. A review of the FSP will aid in developing fuel management prescriptions consistent with other resource values.

No immediate operational restrictions are apparent that will have an impact on conducting forest fuel treatment projects on crown land.

Any treatments that could affect road right-of-ways, utility right-of-ways, private and leased crown land, and provincial parks must be discussed with stake holders prior to implementation. The planning area wildfire threat rating map identifies natural gas and hydro transmission lines as well as the road networks of the Ministry of Transportation and the Ministry of Forests and Range. The Canadian National Railway (CNR) line transects IR# 1, 4 & 4a on the north side of the Skeena River.

### 9.3 Higher Level Plans

Higher level plans that are relevant to the Kitselas Community Wildfire Protection Plan include the Kitselas Forest Stewardship Plan, the Regional District of Kitimat Stikine and the City of Terrace Community Wildfire Protection Plan, and the Patch and Seral Stage Analysis plan for the Kalum Forest District.



## 9.4 Funding Opportunities

Funding opportunities to achieve actions and recommendations as outlined in the Kitselas CWPP will come from a variety of sources. These could be government sponsored programs that deliver operational fuel treatment dollars through agencies like FNESS or Natural Resources Canada Mountain Pine Beetle Program or existing government entities such as the Regional District of Kitimat-Stikine and the Ministry of Forests and Range.

In Section 13, Recommendations and Action Items, each action identifies an entity that is tasked with moving forward on suggested action.

## 10 Band Contact Names

The following lists key personnel from the Kitselas First Nation that would be available to assist in the planning and implementation of fuel management treatments. In addition, the Kitselas FN concluded fuel management activities under the Natural Resources Canada Mountain (NRCAN) Pine Beetle Program, where capacity in the implementation of fuel treatment projects was increased. This capacity was in program management, supervision, administration and labour.

- Wilfred McKenzie, General Manager - Kitselas Forest Products
- Glen Bennett, Chief Councilor - Kitselas First Nation
- Fred McKenzie, Field Supervisor/Guardian - Kitselas First Nation
- Web Bennett, Tour Coordinator - Kitselas Canyon
- Roger Leclerc, Economic Development Coordinator Kitselas First Nation
- Terry Collins, Resource Technician - Kitselas Forest Products
- Ken McDames Jr., Habitat Technician - Kitselas First Nation
- Fred Mason, Head of Public Works - Kitselas First Nation

## 11 Partnership Contact List

The following lists key personnel that may be required to participate in fuel management work, both the planning and implementation.

- Tony Falcao, Fuel Management Specialist - Northwest Fire Zone, MOFR  
Tel: 250-635-0251 email: [Tony.Falcao@gov.bc.ca](mailto:Tony.Falcao@gov.bc.ca)
- Steve Schmidt, Forest Fuel Management Specialist - First Nation Emergency Services (FNESS)  
Tel: 250-377-7600 email: [sschmidt@fness.bc.ca](mailto:sschmidt@fness.bc.ca)
- Thomas Blank, Coordinator Forest Fuel Management - FNESS  
Tel: 250-377-7600 email: [tblank@fness.bc.ca](mailto:tblank@fness.bc.ca)
- Grant Watson, Area Manager - Ministry of Transportation and Highways  
Tel: 250-638-6403 email: [Grant.Watson@gov.bc.ca](mailto:Grant.Watson@gov.bc.ca)
- Mike Maser, Transmission Maintenance Technologist - BC Hydro  
Tel: 250-638-5632 email: [Mike.Maser@bchydro.com](mailto:Mike.Maser@bchydro.com)
- Sandy Paterschuk, Utilityman - Pacific Northern Gas  
Tel: 250-638-5319 email: [spaterschuk@png.ca](mailto:spaterschuk@png.ca)
- Ted Pellegrino, Planning Manager - Regional District of Kitimat Stikine  
Tel: 250-615-6100 email: [tpellegrino@rdks.bc.ca](mailto:tpellegrino@rdks.bc.ca)
- Jon Schultz, Planner - Coast Tsimshian Resources- Licencee  
Tel: 250-615-2040 email: [jon\\_schulz@brinkman.ca](mailto:jon_schulz@brinkman.ca)
- Wes Patterson, Fire Chief - Thornhill Volunteer Fire Department

Tel: 250-638-1466 email: [fire\\_chief@thornhillfire.ca](mailto:fire_chief@thornhillfire.ca)

- Brian Wilman, Service Manager - Telus  
Tel: 250-638-4280 email: [brian.wilman@telus.com](mailto:brian.wilman@telus.com)
- Marvin Kwiatkowski, Director of Development Services - City of Terrace  
Tel: 250-615-4041 email: [mkwiatkowski@city.terrace.bc.ca](mailto:mkwiatkowski@city.terrace.bc.ca)
- Mitch Drewes, Habitat Technician - Department of Fisheries and Oceans  
Tel: 250-615-5353 email: [Mitch.Drewes@dfm-mpo.gc.ca](mailto:Mitch.Drewes@dfm-mpo.gc.ca)
- Brian Last, Parks Supervisor - BC Parks (Ministry of Environment)  
Tel: 250-798-2277 email: [bryan.last@gov.bc.ca](mailto:bryan.last@gov.bc.ca)

## 12 Band Capacity /Experience

The Kitselas First Nation has a Resource Management Department as well as a forest licensee that manages the forest resources on licenses granted by the Province of BC. The forest license requires the management of all forest resources and the integration of the values and objectives of each of those resources in prescribing and implementing land use decisions. The Kitselas First Nation has a track record of resource management in terms of program oversight, site supervision along with a trained and experienced work force that has a vast experience in the forest industry as saw operators, fallers, logging crews, equipment operators and resource technicians. The capacity of Kitselas First Nation to implement fuel management work has recently been demonstrated on the NRCAN mountain pine beetle program where fuel treatment work was completed on Kitselas IR #1 and Kshish IR # 4 and 4a.

## 13 Recommendations and Action Items

For the Kitselas First Nation to achieve the greatest benefit from having a CWPP several Action Items should be considered.

### ***ACTIONS for the Kitselas Band Council:***

- Continue to implement fire smart principles when planning and constructing development within the Kitselas First Nation IRs.
- Promote fire smart principles to homeowners within the planning area. This could be accomplished by utilizing personnel from the Thornhill Volunteer Fire Department which includes some Kitselas Band members.
- Pursue funding changes to UBCM and FNESS Operational Fuel Management Treatments to include Fire Smart education and delivery as an eligible project. Delivery of this material and buy in from landowners has the potential to result in more effective fuel management treatments directly adjacent to structures and development, providing defensible positions for suppression forces.
- Implement fuel management activities within the Kitselas CWPP planning area as identified in this report.
- Pursue funding through Natural Resources Canada or other agencies to complete identified fuel management activities within the Kitselas IR #1.

In addition the Kitselas Band supports the following recommended actions by other local governments and agencies as identified in the Regional District of Kitimat-Stikine and the City of Terrace CWPP. That report contains actions that will improve the safety of all communities from the devastating effects of wildfire.

**ACTIONS for the Office of the Fire Commissioner (OFC):**

**Regarding Fire Smart**

- Pursue changes to the eligibility of UBCM funding so that it can be applied against training of fire suppression forces in urban wildland interface fires, training of suppression forces in Fire Smart principles, and on the ground delivery and education of landowners by fire suppression forces in Fire Smart techniques

**ACTIONS for Local Governments and First Nation Villages**

**Regarding Fire Smart**

- Commit to applying the Fire Smart principles in issuing development permits or planned expansion. Ensure building codes are adhered to.
- Commit to continued and enhancing training and cross training of fire suppression agencies on wildland interface fires.
- Commit to training of land use planners and developers on Fire Smart principles.
- Commit to educating land owners in Fire Smart principles through media/ signage/site visits and demonstration pilot projects.
- Pursue funding to involve trained and experienced fire suppression personnel in delivery of Fire Smart principles to the local landowners
- Pursue where practical and affordable the development or improvement of fire suppression resources in areas with little or no fire fighting capabilities.
- Pursue changes to the eligibility of UBCM funding so that it can be applied against training of fire suppression forces in urban wildland interface fires, training of suppression forces in Fire Smart principles, and on the ground delivery and education of landowners by fire suppression forces in Fire Smart techniques.

**ACTIONS for Land Owners**

**Regarding Fire Smart**

- Commit to reducing the potential impact of wildland fires on your property
- Complete structure and hazard assessment of property
- Protect your "home", your investment
- Maintain priority zones/ break the chain of fuel around your property
- Promote pine overstory removal when fire-smarting properties and structures. Encourage resistant understory species such as hemlock, cedar and deciduous species
- Remove ladder fuels and dead and down material in areas within 30 meters of any structures in and around the interface
- Ensure adequate emergency vehicle access
- Ensure adequate water supply
- Make your exterior Fire Smart

**ACTIONS for Provincial Government: MOFR Wildfire Management Branch**

**Regarding Fire Smart**

- In concert with local fire departments, involve trained and experienced fire suppression personnel in delivery of Fire Smart principles to the local landowners
- Pursue changes to the eligibility of UBCM funding so that it can be applied against training of fire suppression forces in urban wildland interface fires,

*training of suppression forces in Fire Smart principles, and on the ground delivery and education of landowners by fire suppression forces in Fire Smart techniques.*

**Regarding Cross Training/ Liaison/Preparedness**

- *Enhance cross training of wildland and structural suppression forces in courses such as series 100 and series 215 (Fire operations in the Wildland/Urban Interface) and more advanced training as outlined in the Fire Smart Manual.*
- *Establish a more formal communication plan between the volunteer fire departments and the MOFR that will itemize actions and objectives as predicted fire starts and intensities increase. This may include table-top scenarios on preparedness levels, describing plans for expanded attack and contingency plans.*
- *Review and redraft current preparedness and response plans in consultation with local fire departments.*
- *Implement district command group meetings based on fire weather thresholds and include in the development of the communication plan*
- *Pre-organize water sources and tanker re-load locations in areas that do not have municipal or regional district fire hydrant infrastructure.*

**ACTIONS for Regional District of Kitimat-Stikine**

**Regarding Bylaws**

- *Regional District consider implementing Fire Smart principles as a requirement of any planned development applications and include in by-laws or development checklist*

**Regarding Fire Preparedness**

- *Continue to develop access to water sources to improve protection services.*

**ACTIONS for the Ministry of Environment and MOFR (District Manager):**

**Regarding the OBSCR**

- *Maintain burning as a tool for cost effective fuel hazard reduction.*
- *Continue to require and enforce fuel hazard assessments and fuel hazard abatement on all forest harvesting operations located on Crown land. Request periodic updates from MOFR-District Manager on abatement status of hazards*
- *Continue to monitor and enforce abatement of fuel hazards on private land harvesting and clearing operations within 1 kilometer of a forest*
- *Provide RDKS with information regarding Wildfire Act roles and responsibilities and reference to hazard abatement requirements. Establish protocol with MOFR-District Manager Compliance & Enforcement and RDKS to ensure hazards created by landowners are abated.*
- *Ensure Open Burning Smoke Control Regulation compliance, and improve enforcement of burning reference numbers.*

**Regarding harvesting/development within the Wildland-Urban Interface**

- *Concentrate harvesting plans in the pine leading forests around the airport flats area in advance of expected large mortality of these stands caused by the mountain Pine Beetle.*
- *Initiate clearing of forest types at risk to mountain pine beetle infestation through planned development projects.*

- *Develop fuel management plans that build on existing fuel modification treatments such as timber harvesting, land clearing and planned development that promote fuel “mosaics”*

**Regarding Silviculture stand Tending within the Wildland-Urban interface**

- *MOFR to develop a tactical or **higher-level** silviculture treatment plan that addresses scheduling and hazard mitigation techniques that are to be included in Stand Management Plans for areas within the interface zones.*

**ACTIONS related to the Airport Industrial Lands**

- *City of Terrace to advance the development of the airport industrial land to provide a fuel break on this large contiguous fuel type and to reduce the amount of land susceptible to attack from the Mountain Pine Beetle. The project also presents the opportunity to Fire Smart the 30 meter planned buffers on the developed area.*
- *Create a road right of way that bisects the large contiguous pine forest on the Airport flats.*
- *Demonstrate fuel management activities on the airport industrial lands.*

**ACTIONS related to Utilities and Local Government Infrastructure**

- *Utility companies, provincial emergency services, and local governments undertake a review of all their facilities for a Fire Smart hazard assessment and conduct the necessary actions to safeguard against wildland fires. Review facilities such as hydro and natural gas stations, and domestic water supply sources with particular attention to power sources*

**ACTIONS related to a potential Pilot Project**

- *Implement one or several pilot projects around community infrastructure that will showcase Fire Smart principles.*

**Appendix 1: Detailed maps showing Fuel Types, Wildfire Threats and FMUs**

Shown in a separate attachment titled: "Community Wild Fire Protection Plan Wildfire Threat Rating Map".

**Appendix 2: Summaries of Wildfire Threat hazard Ratings**

Shown in a separate attachment titled Wildfire Threat Rating and Data Summaries

**Appendix 3: Historic Fire Starts and Specific Causes**

Shown in separate attachment titled Historic Fire Starts and Specific Causes



**Appendix 4: Sources of Information**

<b>Information Source</b>	<b>Publisher</b>	<b>Date of publication</b>
<i>Historic Wildfire starts for the Kalum Forest District</i>	MoFR	2008
<i>Wildfire Act and Regulations - current to February 2009</i>	MoFR	2005
<i>Open Burning and Smoke Control Regulations - current to February 2009</i>	MoE	2006
<i>Guide to Open Burning Smoke Control Regulation - current publication</i>	MoE	Current Version
<i>OBSCR – Policy Intentions Paper for Consultation</i>	MoE	May 2008
<i>Union of BC Municipalities - Fuel Management - Current to February 2009</i>	UBCM	Current Version
<i>Forest Inventory Data - for Kalum Forest District TSA</i>	MoFR	Current Version
<i>Wes Paterson, Fire Chief - Thornhill Volunteer Fire Department</i>	Interview	Sept 29/ 08
<i>Pete Weeber, Fire Chief - Terrace Fire Department</i>	Interview	Nov 18/08
<i>David Block, Planner - City of Terrace</i>	Interview	Nov/12/08
<i>Ted Pellegrino, Planner - Regional District of Kitimat Stikine</i>	Interview	Nov 24/08
<i>Brian Grunewald, Regional Fuel Management Specialist – Ministry of Forests and Range (MoFR)</i>	Interview	Oct 15/08
<i>Steve Westby- Terrace Fire Attack Base- Base Manager-MoFR</i>	Interview	Nov 13/08
<i>Kazmir Kopec, Forest Protection Tech - Terrace Fire Attack Base, MoFR</i>	Interview	Nov 13/08
<i>Tony Falcao, Fuel Management Specialist - Northwest Fire Zone, MoFR</i>	Interview	Nov 24/08
<i>Mike Pritchard, Forest Protection Tech – Northern Interior Forest Region, MoFR</i>	Interview	Nov 24/08
<i>Brad Martin, Senior Protection Officer - Northern Interior Forest Region, MoFR</i>	Interview	Dec 16/08
<i>Gail Campbell, Planner – BC Timber Sales (Skeena Business Unit)</i>	Interview	Nov 25/08
<i>Aaron Benterud, MPB Specialist - Kalum Forest District MoFR</i>	Interview	Nov 13/08
<i>Jeremy Lafontaine, MPB Specialist - Kalum Forest District MoFR</i>	Interview	Nov 13/08
<i>Wilfred McKenzie, General Manager- Kitselas Forest Products</i>	Interview	Dec 18//09
<i>Gary Bell, Senior Environmental Protection Officer, Ministry of Environment</i>	Interview	Jan 21/09
<i>Steve Roberts, Band Manager – Kitsumkalum First Nation</i>	Interview	Nov 10/08
<i>Brian Wilman, Service Manager - Telus</i>	Interview	Feb 25/09