Bella Bella

COMMUNITY WILDFIRE PROTECTION PLAN

August, 2006

Submitted to:

Central Coast Regional District
and Heiltsuk Nation

By:

Hans Granander, RPF

Wildfire Emergency Contacts

Organization	Phone #
Bella Bella Fire Department	957-2345
Forest Fire Reporting – Ministry of Forests	**1-800-663-5555**
Coastal Fire Centre – Ministry of Forests, Parksville	1-250-951-4222
North Island Mid Coast Fire Zone – MOF, Campbell River	1-250-286-7645
NI MC Fire Zone – Protection Officer, Tom Rushton	1-250-286-6632
NI MC Fire Zone – Hagensborg field office	1-250-982-2000
Bella Bella RCMP	957-2388
Bella Bella Emergency – Mel Innes	957-2756
PEP – Provincial Emergency Program	1-800-663-3456
Central Coast Regional District Emergency CCRD Emergency Coordinator	1-250-799-5291 1-250-982-2424
Coast Guard	1-800-567-5111

Last update: May 1, 2006

Executive Summary

Bella Bella (Electoral Area B of Central Coast Regional District) is located on Campbell Island in the outer central coast area where the risk of wildfire is relatively low compared to other parts of the Province. However, there is growing concern within the community, and recent fire occurrences confirm, that wildfire is a threat to communities in this part of the Province.

Evaluation of the Interface Community Fire Hazard for Bella Bella indicates a **moderate hazard**. This report documents the criteria that informed the evaluation and includes descriptions of the surrounding forest, the forest fuel types, community infrastructure, emergency response and special concerns that affect the rating.

As per the Ministry of Forests and Range analysis, Bella Bella has a **low to moderate probability of wildfire** but if a wildfire was to get started it would burn very intensively making control and fire suppression difficult.

Even a small interface fire affecting one or two homes would have a big effect on the community given its small size. Much of the work to mitigate the risk falls on the shoulders of local residents to address the forest fuel hazard around their homes and properties.

Summary of Recommendations:

1. First Nations are advised to make use of the resources available through FNESS to address capacity building, training, planning, policy development, preparedness and equipment resource needs.
2. Develop public education and information distribution program regarding wildfire regulation and implement this as part of the broader emergency preparedness program.
3. Include interface fire management as one of the hazards that the local emergency response group considers and addresses.
4. Integrate notification of Coast Guard in event of interface fire for assistance with evacuation if necessary.
5. Determine the band's level of responsibility for homes owned by the band. Develop education and incentive program for individuals to address fuel hazard around their homes.
6. Continue to inform the general population about current fire danger ratings and any restrictions on 'hot work' activities and campfires. Work to enhance education to raise awareness of means to minimize risk of wildfire ignition. Explore use of local TV channel to provide fire information.
7. Establish program to methodically remove wild growing broom plants before problem gets too large.

8. Conduct S-100 Basic Forest Fire Fighting training for volunteer firemen on an annual basis.
9. Strengthen routine and ongoing communication between Bella Bella emergency response personnel and MOFR Fire Protection Officer.

Mitigation

- Conifer trees in the vicinity of homes should be pruned to a height of at least 2m. Branches overhanging houses or balconies should also be pruned back. Wild growing brush and other woody material should also be cleared from around houses.
- Trees along the perimeter of the village should be pruned so that branches are at least 2 m above the ground (the higher the better). Smaller 'ladder' fuel trees should also be removed to minimize ability for fire to climb into the canopy.
- Establish program to remove scotch broom plants before problem becomes unmanageable.

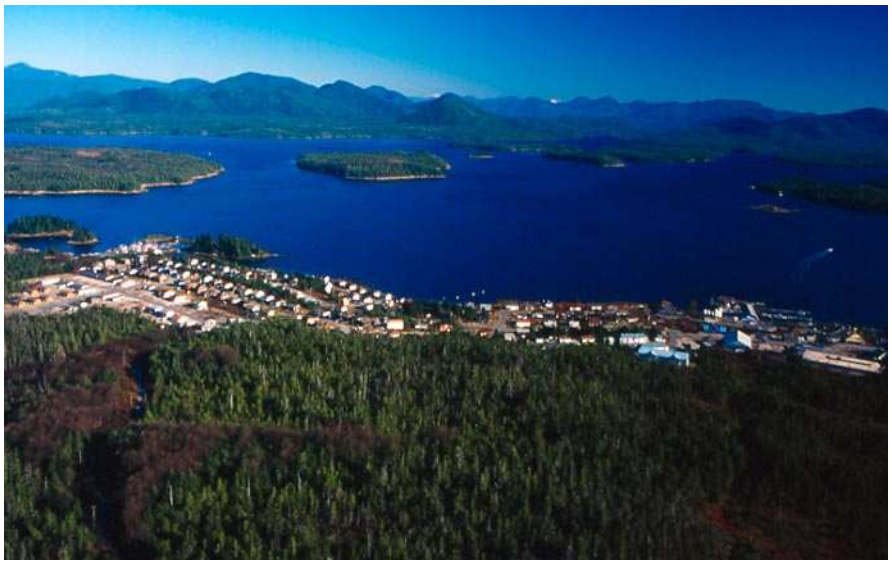
Foreword

This Community Wildfire Protection Plan was prepared on behalf of the Central Coast Regional District, Heiltsuk Nation and the residents of Bella Bella, with funding assistance from the Union of BC Municipalities. The plan provides an overview of the community, describes the surrounding forest fuel types, estimates the interface fire hazard and provides mitigating recommendations.

Acknowledgement

Many people assisted with the development of this plan. Acknowledgement and gratitude is due to Stephen Waugh, Emergency Coordinator and Donna Mikkelson of the Central Coast Regional District; Mel Innes Heiltsuk Emergency Coordinator and Bella Bella Fire Chief Sunny Hunt, and Sergeant Terry MacKellar, RCMP.

Bella Bella with view towards the east.



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Bella Bella Community Wildfire Protection Plan

Prepared by:

Hans Granander, RPF August 18, 2006

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1 Introduction

The Central Coast Regional District (CCRD) is working to help the communities of the Central Coast become more resilient to disasters. All of the communities of the Central Coast are surrounded by coniferous forests and the potential for forest fires to cause significant damage to homes, businesses and facilities is a real threat and of growing concern. Virtually all of the homes and businesses in the Central Coast are built amongst trees in close proximity to the forest and therefore are situated in the 'interface' fire zone, where risks are highest.

To address this safety concern, the CCRD is working to make Central Coast communities 'Firesmart' and with the support from the Union of British Columbia Municipalities (UBCM), has commissioned the preparation of Community Wildfire Protection Plans (CWPP) for each community. The purposes of these plans are to:

- Assess, document and map interface wildfire hazard
- Recommend fire prevention and mitigation strategy
- Recommend implementation activities regarding zoning, by-laws, development and landscaping
- Enhance emergency response plans
- Propose public communication strategies
- Recommend plan monitoring and updating mechanisms.

Bella Bella (Electoral Area B of CCRD) is located on Campbell Island which is situated in the outer, central coast (see map in Appendix A) where forest fire danger is low compared to many other areas of the province. The landscape on Campbell Island is characterized by a complex of scrub forest and muskeg with occasional larger timber stands on elevated or sloped sites. Bella Bella is situated on a sloping shoreline and, as such, the forest around the immediate perimeter of the community is of the larger and denser type found on the island. With changing weather patterns, there is increasing local concern that their community is at risk from a damaging interface fire, even though it is one of the wetter places in the province.

In response to this identified concern, the CCRD has commissioned the preparation of the Bella Bella Community Wildfire Protection Plan and is presenting it to the Heiltsuk Nation as helpful information only. By no means should it be interpreted that the CCRD is imposing any requirements on the Heiltsuk or that it assumes any responsibility on Indian Reserve lands. The CCRD's interests are to work cooperatively with all local First Nations and to coordinate emergency planning, preparation, mitigation and response programs for joint benefit.

1.1 Planning Area

The plan covers the area immediately surrounding the Bella Bella community on Campbell Island.

1.2 Legal Framework

Interface fire is primarily addressed by the Provincial Wildfire Act (2005) and Regulations. This legislation spells out the authorities, obligations and responsibilities for the different layers of government, industry and individuals. The Provincial government has the authority to enter onto any land in the province to carry out fire control measures, including entering property, restricting access, order an evacuation and requisition persons and equipment. The government may also provide fire control assistance when requested by a local government.

Compared to previous versions of the fire legislation, greater responsibility is now placed on municipal governments to address use of fire and prevention of wildfire within their jurisdictions. With respect to the duties of a Regional District, unless they have established bylaws dealing with open fires or wildfire, then requirements still default to the Provincial standards under the direction of the Ministry of Forests and Range. Indian Reserve lands fall under Federal jurisdiction but through agreement with Indian and Northern Affairs Canada (INAC), the Ministry of Forests will take action to suppress wildfires and then bill INAC for the costs.

At this time there is no legal requirement for the Central Coast Regional District or First Nations to carry out Community Wildfire Planning; however, in the interest of making Central Coast communities 'disaster resilient', the CCRD is undertaking this proactive and preventative initiative.

Other legislation that pertains to fire in and around communities include:

- Forest and Range Practices Act
- Land and Parks Waste Management Act
- Open Burning Smoke Control Regulation

1.3 Local Fire Policies and Programs

The Central Coast Regional District is challenged financially with an extremely tight budget, limited due to its small tax assessment base. As such, the CCRD lacks administrative and other resources to take on a greater role in dealing with wildfire prevention and control. Therefore, the CCRD does not have any policies or regulations regarding wildland interface fire and, by default, rely on Provincial regulation, policies and

support to control wildfire. Furthermore, there are no local bylaws or zoning requirements dealing with wildfire prevention or mitigation.

Similarly, the Heiltsuk Nation does not have any policies or bylaws regarding fire. Through this plan however, the CCRD and Heiltsuk Nation recognizes the importance of determining the interface wildfire hazard and to inform residents so they can take voluntary action to reduce wildfire hazard in the vicinity of their homes and properties.

The Heiltsuk Nation and CCRD's role as governments is more pronounced however in the event of an actual interface wildfire. In this kind of crisis situation, the Heiltsuk Nation and/or CCRD (for non-reserve lands) may issue a **Local State of Emergency** to invoke powers necessary to address the emergency, including the issuance of an Evacuation Order (please refer to CCRD Emergency Plan for further information).

Bella Bella has a volunteer fire department to respond to residential fires. The local fire fighting capacity is described in more detail in Section 5, Emergency Operations. It is clear however that there are inadequate resources to fight anything but the smallest interface fire and therefore quick assistance from outside the community is crucial.

1.3.1 First Nations Emergency Services Society

The First Nations Emergency Services Society (FNESS) is an organization, funded through INAC, specifically set up to help First Nations develop and sustain safer and healthier communities by providing programs, services and related training and education. Under their **Fire Services** program, Fire Surveys are conducted, First Responder training is provided, Fire Competitions are held, Fire Safety Public Education is available along with Firefighter training. Under the **Community Fire Life Safety Support Program**, training and assistance for Fire Chiefs to run an efficient and proper fire department is available.

FNESS is also available to provide emergency management guidance for dealing with issues like evacuation orders.

www.fness.bc.ca

Recommendation: First Nations are advised to make use of the resources available through FNESS to address capacity building, training, planning, policy development, preparedness and equipment resource needs.

1.4 Key Wildfire Regulation Requirements

Given the small size of Central Coast communities, almost all of the settled areas are in close proximity to the forest. Since the provincial wildfire legislation pertains to, not only forested areas, but areas within specified distances of a forest, the regulations apply to most areas in central coast communities. Key elements of the regulations that apply to industries, businesses and residences include hazard assessments, hazard mitigation, restrictions on industrial activities, fire preparedness and permissible fire requirements.

The Provincial Wildfire regulations do not directly apply to Indian Reserve lands, which are under Federal jurisdiction. However, in the interest of due diligence, the adoption of the precautionary practices as described in the regulations is advisable.

Note: The following is only a brief summary of the Wildfire Regulation. It is provided for basic information only. Those persons carrying out activities in the vicinity of a forest must refer to the current wildfire legislation for a complete understanding of the requirements. These regulations can be accessed at:

www.for.gov.bc.ca/protect/

Although the regulations apply to most activities, particular emphasis is placed on 'industrial activity' and 'high risk activity'. In general, **industrial activity** refers to land clearing and activities related to forestry, like logging, processing and silviculture, but it also includes activities like refuse disposal and road maintenance. **High risk** activities, again generally, refers to forestry work, but it also includes welding, grinding, right of way grass mowing and use of pyrotechnics. These types of activities are undertaken regularly within Central Coast communities and it is important that people are aware of their responsibilities in these regards.

Sufficient Fire Fighting Tools

Anyone carrying out an industrial activity that has potential to cause wildfire is required to keep sufficient fire fighting hand tools on site.

High Risk Activity Restriction

Anyone carrying out a high risk activity within 300 m of a forest during fire season must determine the Fire Danger Class and conduct operations in accordance with any applicable restrictions (fire watch, early shift, shutdown, etc), must have adequate hand tools and adequate fire suppression system (fire pumps and water) on site.

Precautions to Prevent Escape of Fire

Anyone carrying out an industrial activity, including waste disposal, within 300 m of a forest must maintain sufficient fuel break to ensure fire does not escape.

Hazard Assessment

Anyone conducting industrial activity or operating a waste disposal site within 2 km of the boundary of the local government or a fire prevention district in a Regional District must conduct fire hazard assessment at 3 month intervals.

Hazard Abatement

For those areas where Hazard Assessments are required (within 2 km zone), fire hazard abatement is to be done within 6 months of the assessment.

Permissible Open Fires

There are four categories of permissible fires, three of which generally applies to communities:

- **Category 1 –** small fire (<1m height & diameter), including campfires.
- **Category 2 –** one or two moderately small fires (< 2m height & 3 m diameter), or grass fire <0.2 ha.
- **Category 3 –** 3 or more fires not exceeding 2 m in height or 3 m in diameter; or less than three fires and greater than 2 m in height or 3 m in diameter; or grass fires > 0.2 ha.

These categories require increasing levels of safeguards and the regulations should be referenced for the most up to date requirements. Most Central Coast communities burn their garbage in fires that fit the Category 3 designation and, as such, are required to:

- obey any burning restrictions
- do so in a safe manner
- obtain a burn registration number
- take all necessary precautions
- establish fuel break around fire
- ensure an adequate fire suppression system is available
- maintain a fire watch
- ensure fire does not exceed capacity to prevent escape.

Given the recent changes to the Wildfire Legislation, it is likely that many people are not aware of their responsibilities in regard to their industrial activities and use of fire.

Recommendation:
Develop public education and information distribution program regarding legal requirements for wildfire mitigation and precaution. Implement this as part of the broader emergency preparedness program.

1.5 Fire Planning Process

A preliminary estimate of the 'Hazard, Risk and Vulnerability Analysis' (HRVA) was conducted in preparation for the Central Coast Outer Coast Emergency Plan (Draft, 2006). This analysis ranked interface wildfire as a hazard of concern for Bella Bella. To address this concern, the CCRD commissioned the development of a Community Wildfire Protection Plan.

The development of the Bella Bella CWPP was initiated at a meeting with key Bella Bella emergency personnel and the CCRD Emergency Coordinator on November 7 & 8, 2005. The following steps and tasks were taken to complete the Plan:

- Available forest inventory maps and data were assimilated.
- Strategic Threat Analysis maps and data were acquired.
- Background information on forest fire ecology, weather data and topography was summarized.
- Information on the community in terms of population, infrastructure, developments, activities and fire control resources was summarized.
- MOFR Fire Protection personnel were consulted.
- Field reconnaissance was conducted to determine forest fuel conditions.
- Interface Fire Planning Units (IFPU's) were identified.
- Hazard evaluation was conducted.
- A draft CWPP with hazard map was circulated for review and comment.
- Final CWPP completed.

1.5.1 Bella Bella Emergency Management & Response

Bella Bella is one of the larger Central Coast communities, but with only 1,200 residents, it is still very small on the provincial scale and so there are limited resources for emergency management and response. Like any community of this size, people wear many 'hats of responsibility' and there are no 'departments' to focus on any one particular task. Mitigation of interface fire hazard therefore needs to be incorporated into regular considerations of the local emergency management committee.

Recommendation: Include interface fire management as one of the hazards that the local emergency response group considers and addresses.

2 Community Profile

Bella Bella is situated along the Inside Passage, half way between Prince Rupert and Port Hardy on the outer, central coast of British Columbia. Home of the Heiltsuk people, it is accessible only by boat or float plane. The establishment of a Hudson's Bay trading post in 1833, prompted Heiltsuk people to congregate to the area from outlying villages. The community now serves as a key transportation hub as it is strategically situated at the cross roads of marine and air traffic routes. Approximately 1,200 people live in Bella Bella and most are of aboriginal descent. Economic activity is primarily ocean based, including commercial fishing, fish processing and marine transport while sport fishing and eco tourism is growing. Forestry is also starting diversify the economy, although most operations are on neighbouring islands. The paved airstrip is an air traffic hub linking the various outer coast communities, fish camps and logging camps with daily service to Vancouver Island and Vancouver.

Figure 1 Bella Bella and Lama Pass. Note forested strips within community made up of a mix of deciduous and coniferous trees.

2.1 Geography

Campbell Island is a relatively flat, low lying island with some rolling hills rising to elevations of around 300 m. Most of the island is inaccessible by road except for areas in the vicinity of Bella Bella on the eastern shore and some logging roads reaching into the central part of the island from the west.

2.2 Population and Community Description

The population of Bella Bella is approximately 1200 people. It is a First Nation community with its own school, hospital and grocery store. Most residences, facilities and infrastructure are located on Indian Reserve lands and are contained within well defined community boundary. Building density is characterized as 'urban' with a density of >1000 buildings per square kilometre. There are clumps and strips of coniferous and minor deciduous tree stands interspersed throughout the community.

2.3 Socio-economic Condition

Many of the residents are existing on meagre incomes and are not in a position to easily recover from a catastrophic event (many people likely do not have insurance or finances to cover emergency expenses). Therefore, it is anticipated that federal and/or provincial emergency financial assistance will be required to help people affected by an interface fire.

Most housing is owned by the Heiltsuk Nation and the responsibility for 'Firesmart' fuel management in the vicinity of band owned homes is unclear.

Recommendation:
Determine the band's level of responsibility for homes owned by the band. Develop education and incentive program for individuals to address fuel hazard around their homes.

2.4 Investments and Infrastructure

Investments include Heiltsuk owned facilities as well as private and corporate infrastructure:

- Residential homes
- Hospital

- School
- Public dock and harbour
- Fish processing facility at McLoughlin Bay
- Ferry Terminal at McLoughlin Bay
- Airport and fuel tanks
- Fuel storage tanks in center of town
- Variety of heavy machinery
- Grocery store
- Community hall
- Church
- Administration office
- RCMP Station
- Restaurant
- Barge ramp.
- Roads
- Telephone & hydro lines
- Water lines.

Bella Bella has a community water system that treats lake water and pumps it to the community. The pumps are electrically powered and there is back up generator power available should main power supply fail.

2.5 Key Community Interface Fire Issues

- Emergency Evacuation: There are few emergency evacuation options for people in Bella Bella. Since roads do not extend very far from the community, people would have to be evacuated by boat to Shearwater on the neighbouring Denny Island in an emergency. The Coast Guard may be called upon to assist with this evacuation.
- Economic disruption from forest fire along power line: Hydro power is transmitted from Ocean Falls to Bella Bella via transmission lines supported by wooden poles. A forest fire along the powerline can cause significant economic disruption by burning up the poles. There is a backup power system at Shearwater which can supply the two communities for about one week.
- Fuel management in green spaces within community and along outside perimeter.

3 Interface Fire Planning Units

Community wildfire plans are broken down into Interface Fire Planning Units (IFPU) in order to facilitate differences in terms of fire hazard, values at risk, logistics and operational challenges. There is only one IFPU surrounding Bella Bella.

3.1 Bella Bella IFPU

The main characteristics of the Bella Bella IFPU are:

- Interface fire zone is primarily around the perimeter of the community, however there are patches of conifer tree stands interspersed throughout the community that are susceptible to fire spotting. Forested strips within the community also contain a mix of deciduous alder.
- There is good set back between buildings and the forested edge in the new housing developments at the north end of the community.
- In the older part of town, the setback between housing and forest is variable – some adequate, while others could benefit from brushing, pruning and clearing/thinning.
- Buildings generally have metal or asphalt tile roofing.
- The garbage dump is located at the northern end of the village.
- Fire hall with fire truck.
- There is good fire hydrant coverage throughout.
- There is good road access to all developed areas.

Figures 2 & 3 Bella Bella. Note density of housing and proximity to forest fuels.

Figure 3. Note mix of deciduous and coniferous forest cover amongst developments.

Figure 4. New developments at north end of village with low amounts of combustible material and good forest set backs.

Figure 5 Older housing area with forest in closer proximity to housing.

4 Wildfire Hazard Assessment

Wildfire hazard is a function of the risk of occurrence in combination with the severity of impact. To determine the hazard, a review of local fire ecology, fire history, likely sources of ignition, forest fuel characteristics and density of developments in the interface is necessary. To objectively quantify the hazard, the Interface Community Fire Hazard Form (ICFH Form) was followed. Appendix C contains the hazard evaluation for each Interface Planning Unit.

In 2005, the Ministry of Forests and Range evaluated interface fire threats and the mapped results of this Strategic Threat Analysis (STA) has been incorporated into the evaluation of the hazard in Bella Bella. Information from the STA include: fire probability classification, building density analysis, probability of human and lightning caused ignition, head fire intensity and spotting potential.

The background information used to complete the hazard evaluation is explained in this section.

4.1 Forest Ecology

Bella Bella is located in the central very wet hyper-maritime variant of the Coastal Western Hemlock (CWH vh2) biogeoclimatic zone and as such is characterized as coastal rainforest. The climate in this variant is typically wet and humid with cool summers and mild winters. In terms of the provincial danger rating, the community is located in Danger Class 1.

The CWH vh2 zone is classed as Natural Disturbance Type 1 (MoF, 1995) where stand initiating disturbances are 'rare' with a mean return interval of 250-350 years. Most of these types of major disturbances that occur at this frequency in the outer coast area are primarily caused by wind but may also be due to landslides or, more rarely, fire. The wet climate makes for very low natural fire occurrence; however, when fires are able to get started, it is during unusually dry conditions when the combination of high volumes of dry wood fuel makes for catastrophic fire situations (Beck, et al 2005). These intense fires 'terminate' forest stands but also 'initiate' new long lived plants. Initial re-vegetation is rapid but full recovery may take hundreds of years.

4.2 Fire Weather

Historical weather data was provided by the Ministry of Forests and Range. There are five weather stations that apply to the Mid Coast Forest District. They are located in Hagensborg, McInnes Island, Machmell drainage, Port Hardy and Talchacko valley. The weather station that provides the most pertinent information to Bella Bella is McInnes Island which is located approximately 37 km northwest of the village. Table 1 summarizes the fire season weather conditions from 2001 to 2005 along with the Canadian Fire Weather Indices and Danger Class records.

Table 1. McInnis Island weather records and fire weather indices records.

Factor	April	May	June	July	August	Sept	Oct
Weather Data:							
Mean Temp C	7.8	9.6	12.5	13.9	14.4	12.3	9.1
Relative Humidity	84.8	83.7	85.1	87.8	91.4	90.0	85.5
Wind Speed (km/hr)	20.7	18.6	16.7	17.2	15.7	20.5	22.3
Wind Direction	149	156	179	162	155	138	141
Precipitation (mm)	164.1	155.8	121.2	134.6	163.5	280.9	1889.0
Fuel Indices:	Gaps in data, particularly for later summer months.						
FFMC	43.4	46.8	49.2	53.6	34.1	18.9	No data
DMC	2.2	3.8	3.4	3.1	1.6	0.2	No data
DC	11.5	32.3	33.9	75.3	80.4	9.3	No data
ISI	1.1	1.6	1.4	1.2	0.3	0.0	No data
BUI	2.9	5.5	4.9	5.5	3.0	0.4	No data
FW	0.8	1.4	1.2	0.9	0.1	0.0	No data
Danger Class (days/mnth)	Data gaps, but rarely reaches moderate danger class.						
Extreme	0.0	0.0	0.0	0.0	0.0	0.0	No data
High	0.0	0.0	0.0	0.0	0.0	0.0	No data
Moderate	0.2	0.8	0.3	0.0	0.0	0.0	No data
Low	3.8	5.0	10.0	8.3	3.5	0.0	No data
Very Low	17.0	17.8	9.3	21.7	27.5	28.0	No data

Unfortunately the availability of Fuel Indices data was inconsistent for different months, particularly late summer months for some years and so the record is incomplete. However, a review of the limited available data shows that the Danger Class (DC) was very rarely above Low (class 2) and the amount of days where the DC was moderate or higher (DC $\geq$ 3) accounted for only 1% of the days during the fire season. This is consistent with the weather data which shows that there is usually regular precipitation throughout the fire season, temperatures are not extreme and relative humidity remains high.

Weather data information show that summer winds usually blow from the south/southeast direction and are characterized as gentle to moderate breeze (Canadian Forest Fire Danger Rating System, CFFDRS). Therefore, fires south of the village are of particular concern. However, locals also

observe that during summer hot spells, the wind can come from northwest direction.

4.3 Fire History

Historically, there have been few fires in the immediate vicinity of Bella Bella; however, in the last few years there have been a number of small fires in the maritime area of the Mid Coast. Small lightning fires occurred near Kwatna inlet in 2003 and 2004. Two human caused fires that were less than 2 ha in size occurred in 2004. In 2005, a fire that grew to 39 ha in size occurred in Johnston Channel (approximately 17 km NW of Bella Bella) along the power line connecting Ocean Falls to Bella Bella and Shearwater. Slash loading was high due to routine power line vegetation clearing. Deemed to be human caused, this fire is significant not just in its size but also because it occurred in April when fuels are usually still wet from winter and spring rains. In recent years there have also been a number of small brush fires within the community that the local fire department has responded to. The residents see these recent incidents as warning signs of increasing fire danger due to changing climatic conditions.

4.4 Risk of Wildfire Occurrence

Risk of occurrence is primarily affected by sources of ignition, the availability of fuel and its condition. Fire history indicates that natural forest fires are rare in the outer coast area and in recent years, human caused ignition is shown to be the main source. Ministry of Forest and Range's Strategic Threat Analysis shows that there is a **low to moderate fire probability** in the vicinity of Bella Bella area (Appendix D).

With human caused fires being the main threat, it is more likely that a fire may spread from the community to the forest interface rather than from the forest to the interface. Regardless of the cause though, once the interface is burning, nearby properties are under serious threat. The main potential sources of ignition in Bella Bella are untimely burning of debris and back yard camp fires. Other accidental sources include children playing with matches or dropped cigarettes. The band no longer burns garbage, preferring to bury it instead.

Given that the most likely ignition source is by humans, there is opportunity to reduce the fire risk through education and due care. The local Fire Chief posts notices from the Coastal Fire Center regarding fire danger in public locations to inform the general population. There is also an informal system whereby residents check with the Fire Chief prior to any back yard debris burning.

Recommendation: Continue to inform the general population about current fire danger ratings and any restrictions on 'hot work' activities and campfires. Work to enhance education to raise awareness of means to minimize risk of wildfire ignition. Explore use of local TV channel to provide fire information.

4.5 Forest Fuels

The forest surrounding Bella Bella is generally described as 'scrub forest' in comparison to typically more productive coastal forests. However, the 'scrub' is actually a mosaic of partially treed bogs on subdued terrain and productive forests on steeper or elevated, better drained slopes. Tree species are primarily western hemlock and red and yellow cedar. Sitka spruce grows along the island shoreline along with lodgepole pine which also grows along bog edges. Patches of red alder can be found on sites where mineral soil has been exposed from disturbance.

In coastal ecosystems, the most volatile fuels are generally associated with slash build up from logging or land clearing. Except for the eastern areas of the district, most of the larger fires in the Mid Coast have occurred in slash fuel types, thereby demonstrating the need to manage fuel loading associated with timber harvesting or forest clearing in the vicinity of the interface. Mature coastal forests generally do not burn easily, except in extreme cases and forested buffer strips have been a key 'fire break' strategy between large areas of slash loading. Often, slash fires will only burn into surrounding forest perimeter to the 'shadow line' (area of direct sunlight permeation from forest edge into the timber). Fuels exposed to open sunlight are often more volatile than those under the shadow of the forest canopy. It should be cautioned though that during extreme weather conditions (prolonged period of dry weather, hot temperatures and wind), then coastal forests will burn and due to the large amount of biomass, fires can be very intense and difficult to suppress.

Ministry of Forest and Range vegetation inventory data was relied on to provide forest cover information. Some minor modification of this information was made based on air photo review and field reconnaissance. Appendix E contains a map depicting the various land/forest cover types in the area and a satellite imagery map (compliments of Western Forest Products Ltd) is provided in Appendix B.

Scotch broom is a particularly, fire volatile, invasive plant specie that is present in scattered locations throughout the village. Fortunately, the problem is not large at the moment; however, the plant is a prolific weed that can spread rapidly unless preventative action is taken.

Recommendation:
Establish program to methodically remove wild growing broom plants before problem gets too large.

4.5.1 Forest Fuel Classification

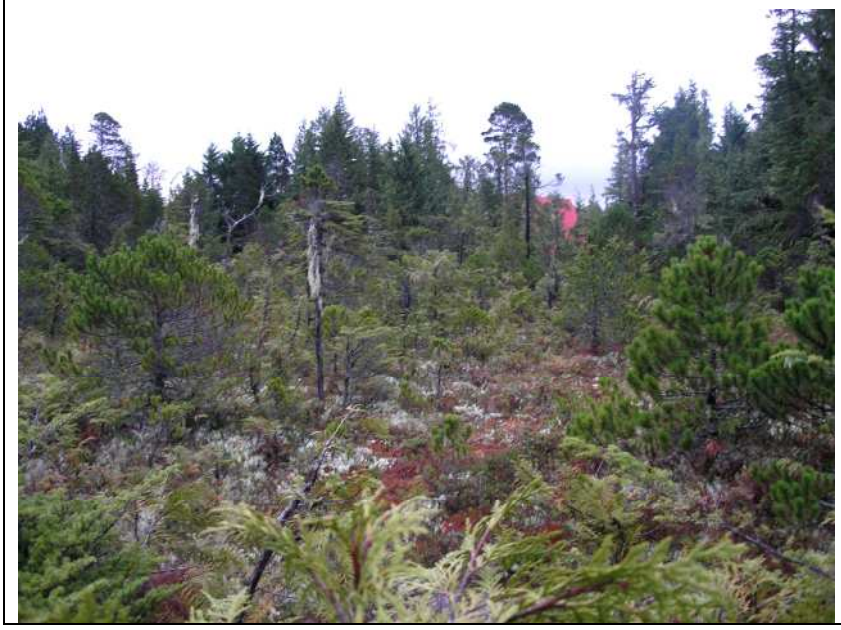
The Canadian Forest Fire Danger Rating System (CFFDRS), developed by the Canadian Forest Service, classifies forest fuels into 16 major types. Most of these classifications were developed in eastern and northern forests and they do not fit very well in terms of describing coastal forest fuels. However, in order to provide some consistency, attempts have been made to best approximate the local fuels in terms of the CFFDR System. There are primarily two types of forest fuel classes in the vicinity of Bella Bella:

- **Bog woodland**, estimated to correspond to CFFDRS C1 Fuel Type. This type occupies much of Campbell Island and is found west of the village.
- **Productive Coniferous**, estimated to correspond to CFFDRS C2 Fuel Type. This type is found around the immediate perimeter surrounding Bella Bella and the forest stands within the village are also of this type.

Burning Difficulty: In the description of the various fuel types, a subjective assessment is made regarding how easily the fuels will burn. In this context, a Burning Difficulty rating of 'low' means that fuels will usually not burn readily. A 'high' rating means the fuels can easily burn.

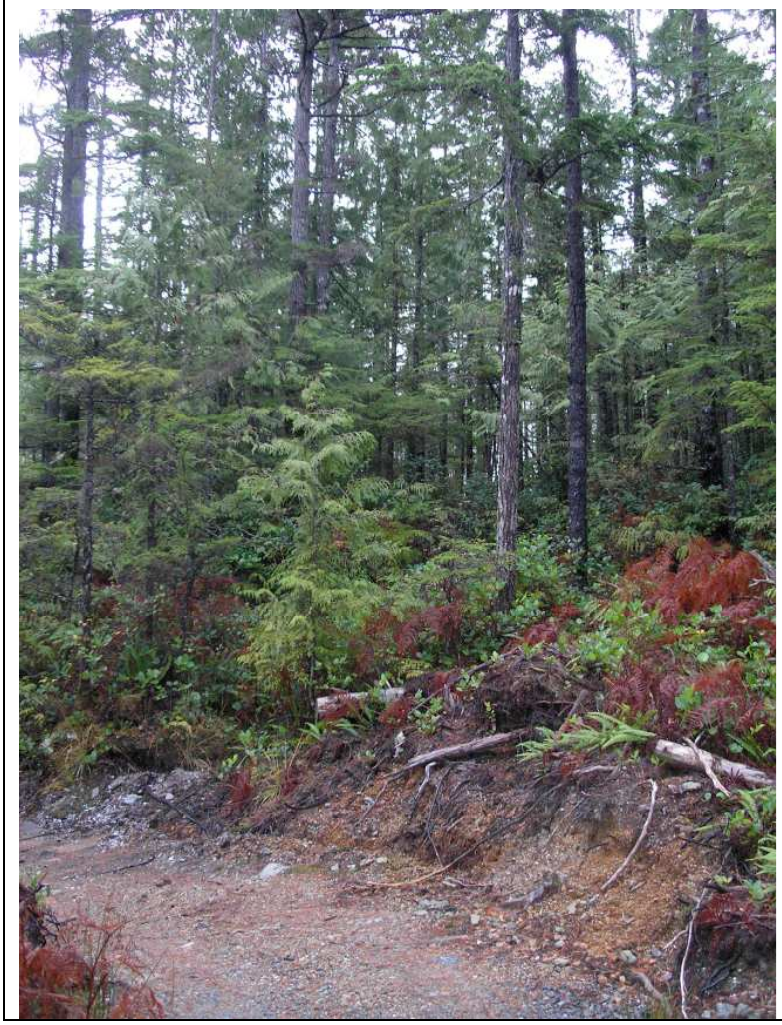
Crowning Potential: Subjective assessments of the various fuel type's potential for crown fire is also made. This assessment incorporated the fuel type, density and presence of ladder fuels. Wind also has a strong influence on crowning potential.

Forest Fuel types in vicinity of Bella Bella



Bog Woodland (C1)

- Coniferous bog complex
- Open park like, clumps of cedar, hemlock and pine trees amongst heather shrub groundcover.
- NP, YC(PH)820
- 3-17 m height
- Live crown 80%
- Crown closure 10%
- Duff > 25 cm.
- Burning difficulty is low with high hazard of intermittent crown torching, or candling.
- Large tracts of this type is situated west of Bella Bella.



Productive Forest C2

- Productive coniferous forest
- CH(S) 831
- Variable canopy structure
- 20-25 m tall
- Crown closure 20-40%
- Moderate understory vegetation.
- 15-20 cm duff.
- Burning difficulty is low with high crowning potential, particularly in windy conditions.
- There is a band of this type of forest immediately surrounding Bella Bella and the patches of forest within the village are also of this character, although these stands also contain an alder component.

The distribution of these fuel types is shown on the Fuel Types map in Appendix F.

The MOFR has also generated an estimation of the anticipated fire intensity based on the types of forest in the vicinity. Termed Head Fire Intensity (HFI), it is the predicted energy output of the fire at the front or head of the fire. It has become one of the standard gauges by which fire managers estimate the difficulty of controlling a fire and select appropriate suppression methods. It is measured in kilowatts per meter of fire front and is based on the Rate of Spread and the Total Fuel Consumption. This analysis indicates that the most of the forest types surrounding Bella Bella would burn with a moderate to high intensity. This rating is lower than that of typical coastal forests due to the lower density of wood biomass in these outer coast forests. The Head Fire Intensity map is provided in Appendix G.

4.6 Density of Developments

In terms of the hazard assessment, Bella Bella is classified as 'rural' and surrounded by 'scattered forest'. In terms of values to protect, the Bella Bella IFPU is categorized as 'complete development' whereby the distribution of structures and facilities is concentrated so that interface fire is mainly a threat along the perimeter.

Building density is characterized as 'urban' with a density of >1000 buildings per square kilometre. Houses are typically one and two story, wood frame dwellings with asphalt tile or metal roofing.

4.7 Hazard Rating

Using the Wildland Urban Interface Fire Hazard Assessment methodology, Bella Bella was determined to have a **moderate** interface fire hazard (see Appendix C for details). Under this hazard ranking, homes and structures are considered to be threatened by interface fire.

The main factors that influence this rating are:

- The low Fire Weather Potential due to coastal climate
- Fuel characteristics - thick duff layers and coniferous forest
- Volunteer fire department however response time is quick
- Good fire hydrant coverage
- Low historical incidence of fire.
- No significant extenuating factors
- Local concerns and observations of changing conditions.

5 Emergency Operations

Please refer to the Central Coast Emergency Plan for up-to-date contact information.

Bella Bella operates a volunteer fire department under authority of the Heiltsuk Nation. The department consists of approximately 9 active volunteer fire fighters. The fire hall is located in the center of town and is equipped with two fire control trucks. Due to the short distances, response time to a fire call is less than 15 minutes. There is good vehicular access to all areas within the community so the pumper truck can reach all places. However, the ability to reach beyond the developed areas and into the forest is limited to around 100 m.

There is good fire hydrant coverage throughout the village

It is a WCB requirement that those partaking in suppression of forest fires receive S-100 training annually. First response to an interface fire will likely be up to the local fire department, therefore it is imperative that fire fighters receive basic forest fire suppression training. The Bella Bella Fire Department has been very proactive in this regard and many of its fire fighters have received basic S-100 Forest Fire Fighting training (43 in 2005) and some have received S-250 (10 in 2005) training as well.

Recommendation:
To comply with WCB requirements, conduct S-100 Basic Forest Fire Fighting training annually for volunteer firemen.

For anything but the smallest interface fire, the Ministry of Forests and Range are relied upon to provide forest fire suppression support. During times of fire danger, the MOFR positions a 'rapattack' crew in Bella Coola that can quickly attack wildfires by helicopter while they are still relatively small. If initial attack efforts are insufficient, then additional fire fighting capabilities and resources can be quickly deployed from the Coast Fire Center in Campbell River.

Currently there is no mutual aid agreement in place between MOFR and the local fire department. It is recommended that contacts be made between the Bella Bella emergency response group and the Fire Protection Officer responsible for the Mid Coast in order to open up communication lines and provide for timely information updates.

Recommendation: Strengthen routine and ongoing communication between Bella Bella emergency response personnel and MOFR Fire Protection Officer.

5.1 Available Fire Fighting Resources

The following resources are available in Bella Bella;

Fire Department

- 9 volunteer fire fighters
- Pumper truck – 800 gl with foam capacity
- 'Snuffer' truck – 250 gl with foam capacity
- 1700 ft of hose
- Generator

Other

- Fire hydrant – pressured by pump
- Heavy equipment – 3 excavators, 1 loader, 2 forklifts, 3 dump trucks.

Accommodation

- Accommodation for fire fighting crews is primarily through a number of bed and breakfast lodgings.

Labour

- Bella Bella does have a relatively large labour pool and through their forestry company and fire department have over 20 people trained in at least S-100.

6 Mitigation and Recommendation Summary

The main realistic opportunities to reduce interface wildfire in the vicinity of Bella Bella is through public education to reduce risk of human caused ignitions and to conduct fuel hazard reduction treatments in the vicinity of homes and structures. Much information can be accessed via the internet on how people can 'Firesmart' their homes and properties. The following government website is a good source:

www.for.gov.bc.ca/protect/

6.1 Mitigation Treatments

- People are encouraged to ensure that conifer trees in the vicinity of their homes are pruned to a height of at least 2m. Branches overhanging houses or balconies should also be pruned back. Wild growing brush and other woody material should also be cleared from around houses.
- Trees along the perimeter of the village should be pruned so that branches are at least 2 m above the ground (the higher the better).

Smaller ‘ladder’ fuel trees should also be removed to minimize ability for fire to climb into the canopy.

- Establish program to remove scotch broom plants before problem becomes unmanageable.
- Given the susceptibility of slash fuels to fire, it is imperative that any mitigative treatments involve the removal of slash build up.

6.2 Recommendations Summary

The recommendations for follow up are re-iterated:

1. First Nations are advised to make use of the resources available through FNESS to address capacity building, training, planning, policy development, preparedness and equipment resource needs.
2. Develop public education and information distribution program regarding wildfire regulation and implement this as part of the broader emergency preparedness program.
3. Include interface fire management as one of the hazards that the local emergency response group considers and addresses.
4. Integrate notification of Coast Guard in event of interface fire for assistance with evacuation if necessary.
5. Determine the band’s level of responsibility for homes owned by the band. Develop education and incentive program for individuals to address fuel hazard around their homes.
6. Continue to inform the general population about current fire danger ratings and any restrictions on ‘hot work’ activities and campfires. Work to enhance education to raise awareness of means to minimize risk of wildfire ignition. Explore use of local TV channel to provide fire information.
7. Establish program to methodically remove wild growing broom plants before problem gets too large.
8. Conduct S-100 Basic Forest Fire Fighting training for volunteer firemen on an annual basis.
9. Strengthen routine and ongoing communication between Bella Bella emergency response personnel and MOFR Fire Protection Officer.

7 Monitoring and Evaluation

Forest fuel conditions and communities change over time and so this plan should be reviewed on an annual basis by the local emergency management committee and updated as required. If major developments or changes occur, such as forestry activity significantly changing the fuel loading of the surrounding forest, then the plan may require rewrite.

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Appendices

Appendix A – Bella Bella Overview and IFPU Hazard Map

Appendix B – Satellite Image Map

Appendix C – Community Wildfire Hazard Assessment Forms

Appendix D – Fire Probability Map

Appendix E – Land and Forest Cover Map

Appendix F – Forest Fuel Type Map

Appendix G – Head Fire Intensity Map