Ocean Falls

COMMUNITY WILDFIRE PROTECTION PLAN

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Submitted to:

Central Coast Regional District
And
Ocean Falls Improvement District

By:

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Executive Summary

Ocean Falls (part of CCRD Electoral Area – A) is located in the heart of the coastal rainforest and as such, the risk of wildfire is 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 Ocean Falls 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. To address the documented issues, seven recommendations and three mitigation treatments are provided to help reduce the hazard of interface fire.

For evaluation and planning purposes, two Interface Fire Planning Units were identified: one on the main Ocean Falls town site, the other at the Martin River settlement. Although there are different concerns at these units, both are exposed to a moderate interface fire hazard, with the Martin River IFPU having a slightly greater threat.

As per the Ministry of Forests and Range analysis, Ocean Falls has a 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

Mitigation

- 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.
- The second growth forest immediately surrounding the Martin River settlement has a relatively low burning risk, however there are 'ladder' fuel conditions at the edge of the stand. Therefore, to reduce risk of fire 'crowning', trees along the forest edge 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.
- Immediately south of the Martin River settlement there is also a deciduous forest stand running vertically from high on the hillside to the

main road (see D1 on page 16). This forest feature also presents a good fire break opportunity.

- Given the susceptibility of slash fuels to fire, it is imperative that any mitigative treatments involve the removal of slash build up.

Other:

1. Include interface fire management as one of the hazards that the local emergency response group considers and addresses.
2. Maintain road to Roscoe Inlet to serve as emergency evacuation route.
3. Develop backup power strategy to keep freezers from thawing out in case of prolonged power outage.
4. Develop education/information program to raise awareness of means to minimize risk of wildfire ignition and develop a system to inform the population about daily fire danger rating and the associated restrictions on 'hot work' activities and campfires.
5. Establish a process to regulate the burning of trash at the dump during appropriate times.
6. Conduct S-100 Basic Forest Fire Fighting training for volunteer firemen.
7. Strengthen routine and ongoing communication between Ocean Falls emergency response personnel and MOFR Fire Protection Officer.

Foreword

This Community Wildfire Protection Plan was prepared on behalf of the Central Coast Regional District and the residents of Ocean Falls, 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; Jim Nyland, Ocean Falls Improvement District Administrator; Ed Backman, Chair Ocean Falls Improvement District and Ocean Falls Fire Chief; Brent Case, Central Coast Power and a special thanks to Mike Crocker, Ocean Falls Deputy Emergency Coordinator for his assistance and hospitality.

Disclaimer and limitation of liability

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Ocean Falls Community Wildfire Protection Plan

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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.

Ocean Falls is located in the heart of the coastal rainforest (see map in Appendix A) where forest fire danger is relatively low compared to many other areas of the province. However, due to the productive growing conditions, the coastal rainforest contain a 'tremendous accumulation of biomass' (Pojar & MacKinnon, 1994) and when conditions are right, and this concentration of wood fuel is ignited, it is extremely difficult to control the spread of wildfire. With changing weather patterns there is increasing local concern that even one of the wettest places in the province is at risk of a damaging interface fire. Given Ocean Falls isolation and limited resources, an interface fire would be devastating to the community.

1.1 Planning Area

The plan covers the head of Cousins Inlet where the remnants of the once bustling pulp mill town of Ocean Falls is situated. The area is divided into two distinct planning units:

- the industrial Ocean Falls town site and
- the Marten River residential area where most of the few inhabitants live.

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. Compared to previous 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.

As authorized in the legislation, the Provincial government has the authority to carry out fire control measures anywhere in the Province and at the request of local government may enter on land and carry out fire control within the local government's jurisdiction. In Ocean Falls, the Fire Protection Branch of the MoFR, is the lead agency responsible for interface wildfire suppression.

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

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. There are no local bylaws or zoning requirements dealing with wildfire prevention or mitigation. Through this plan however, the CCRD recognizes the importance of determining the interface wildfire hazard and providing information to residents so they can take voluntary action to reduce wildfire hazard in the vicinity of their homes and properties.

The CCRD's role is more pronounced however in the event of an actual interface wildfire. In this kind of crisis situation, the CCRD 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).

The Ocean Falls Improvement District has a volunteer fire department to respond to residential fires. However, this fire department is not trained or equipped to fight forest fires. Section 5.1 – Available Fire Fighting Resources, describes the local fire fighting capacity in more detail; however, it is clear that there are inadequate resources to fight anything but the smallest interface fire and therefore quick access to resources from outside the community is paramount.

There are no zoning by-laws in Ocean Falls pertaining to interface fire management, construction standards or wood fuel reduction. The CCRD is not contemplating initiating a process of establishing zoning or by-law regulations in regard to interface fire management at this time. The District simply does not have the resources to undertake such a task. Provincial statutes, policies and standards by default provide direction on interface fire issues.

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 the 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. To address this concern, the CCRD commissioned the development of a Community Wildfire Protection Plan.

The development of the Ocean Falls CWPP was initiated at a meeting with key Ocean Falls emergency personnel and the CCRD Emergency Coordinator on October 28, 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 Ocean Falls Emergency Management & Response

Ocean Falls is a very small community (<100 residents) and so there are limited resources for emergency management and response. As a matter of necessity, people in isolated communities help each other in times of emergency, and Ocean Falls is no different in this regard. Like any community of this size, people wear many 'hats of responsibility' and there are no 'departments' to focus on any one particular task. Ocean Falls has a local Deputy Emergency Coordinator volunteering as an extension of the CCRD Emergency Management Program. Emergency issues are addressed through a local ad hoc committee organized by the Deputy Coordinator. Mitigation of interface fire hazard therefore needs to be incorporated into regular considerations of a 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

Ocean Falls is situated approximately half way between Bella Coola and Bella Bella on the central coast of British Columbia. Home of the 'rain people', it is accessible only by boat or float plane. Originally established as a pulp mill in the early 1900's, it grew to become one of the largest communities on the coast. In its heyday (1940-1970), close to 5000 people lived in this 'small city' which was tightly wedged in between steep mountain backdrops and the ocean at the head of Cousins Inlet. Today, the community may seem a study of industrial decline and abandonment with the skeletal remains of a bygone era defiantly holding ground against the enveloping rainforest. However, there are signs of new activity and with the hydro electric generating legacy from the dismantled pulp mill as its economic base, Ocean Falls is working to re-establish a thriving community through tourism, logging and the newly established fish rearing complex.

Figure 1. Ocean Falls aerial view.

2.1 Geography

The topography surrounding Ocean Falls is steep and rugged with the mountains flanking the inlet rising to heights over 1000 m in elevation. Cousins Inlet is a typically deep central coast fiord that is densely forested with old growth and immature conifers. Developments are situated on low slope areas at the toe of the mountains and are backed by very steep mountain sidewalls. Access beyond the developed areas is only possible by foot or air. The developed areas are primarily facing a southerly aspect.

2.2 Population

The population varies from about 32 people in winter to approximately 125 in summer. There is no school and the resident population is only comprised of adults. Most people in Ocean Falls reside in the small settlement at the mouth of the Martin River, approximately 2 km west of the main town site. Because the interface characteristics of the two developed areas are quite different, the plan is split into two planning units: Ocean Falls IFPU and Martin IFPU.

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). Furthermore, the Central Coast Regional District has a very small tax base and virtually no industrial tax income so it also lacks resources to assist with emergency response, mitigation and recovery. Therefore, it is anticipated that provincial emergency financial assistance will be required to help people affected by an interface fire.

The hydro electric plant provides most jobs as it supplies energy to the distant neighbouring communities of Bella Bella and Shearwater. The power line connecting these communities is cut through the forest and is mainly held up by wooden poles making this utility particularly vulnerable to forest fire damage with the resultant impact on these isolated communities. Also, the power line is a potential ignition sources as past transformer malfunction has led to a few small spot fires

2.4 Investments and Infrastructure

Investments include private and corporate infrastructure:

- Residential homes
- Hydro electric generating plant and dam
- Fish rearing tank complex
- Machine shop and warehouse
- Fuel storage tanks (enclosed in warehouse)
- Variety of heavy machinery
- Small hotel
- Small retail shop
- Administration office
- Marina facility
- Ferry terminal

- Barge ramp.
- Roads and bridges
- Telephone lines
- Water lines.

2.5 Key Community Interface Fire Issues

- Emergency Evacuation: There are few emergency evacuation options for people in Ocean Falls. A logging road that extends south from the Marten River settlement provides an escape route to Roscoe Inlet through the Ikt Lake valley. However, if a fire is started south of the Marten River, then the only escape would be by boat or ferry from Ocean Falls.

Recommendation: Maintain road to Roscoe Inlet to serve as an evacuation route.

- Economic disruption from forest fire along power line: Although the power line extends beyond the interface area, because it is the economic lifeline of the community, large scale fire damage to the poles can cause economic disruption.
- Small fragile community: Given the small size of the community, even a small interface fire incident affecting one or two homes can have a significant socio-economic effect on the community.
- Smoke: Due to the very narrow inlet and tall mountains, smoke from forest fire could settle in the valley with harmful effect on the aging population, thus necessitating evacuation.
- Because there is limited grocery shopping, people rely on storing months worth of food in their freezers. Consequently, if there is prolonged power outage due to power poles burning up, food will spoil and thereby strain the community's ability to recover.

Recommendation: Develop backup power strategy to keep freezers from thawing out in case of prolonged power outage.

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. Even though Ocean Falls is a very small community, there are two distinct parts to this community – the old town center/industrial complex and the settlement at Martin River. To account for different management considerations in these two areas, two separate IFPU's are identified. See the satellite image map in Appendix B for a visual of the IFPU's.

3.1 Ocean Falls IFPU

The main characteristics of the Ocean Falls IFPU are:

- Relatively large area of development
- The perimeter of the developed area has high concentration of deciduous forest cover.
- There is generally good set back between buildings and the forested edge.
- The density of buildings is relatively low and not all are being used
- Buildings area larger and more spaced out.
- The industrial complex – hydro generating plant and fish rearing facility are constructed of low combustible material.
- The garbage dump is located at the southern side of area.
- There is good water hydrant coverage throughout.
- The bridge over Link river is only rated to 10 tons so large equipment can not be moved over this bridge.

Figure 2 Ocean Falls

3.2 Martin River IFPU

The main characteristics of the Martin River IFPU are:

- Small developed area
- Coniferous forest cover close to houses along perimeter.
- Buildings are densely spaced.
- Most people live in this settlement
- Structures are mainly small sized homes.
- Building roofs are primarily made of metal or asphalt tile
- Homes along road leading to Martin River are most vulnerable as they are more 'enveloped' by coniferous forest compared to the rest of the settlement.
- Pump house supplies water from Martin River.
- Bridge over Martin River rated to 150 tons.
- More coniferous trees interspersed throughout area.
- Intensity of human activity in vicinity of interface perimeter is higher.
- Fire hall with pumper truck
- Good hydrant coverage.

Figure 3 Martin River settlement.

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 Forms for each of the Interface Planning Units.

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 Ocean Falls. 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

Ocean Falls is located in the very wet maritime variant of the Coastal Western Hemlock (CWHvm1) 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. Although precipitation is high, it can vary considerably within this variant depending on local rain shadow effects of the coastal mountains (Green et al, 1994). In terms of the provincial danger rating, the community is located in Danger Class 1.

The CWH vm1 biogeoclimatic 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. Stand initiating disturbances returning at this frequency may be due to wind, landslide or fire. The wet climate is the reason for the long period between fires; however, when natural 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 Ocean Falls is McInnes Island. Table 1 summarizes the fire season weather conditions from 2001 to 2005.

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						
FFMC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DMC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ISI	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BUI	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FW	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Danger Class (days/mnth)	Data gaps, but rarely reaches moderate danger class.						
Extreme							
High							
Moderate							
Low							
Very Low							

Unfortunately the data for the Canadian Fire Weather Indices for this weather station could not be summarized as the data was incomplete. However, a review of the existing data showed that the Danger Class (DC) very rarely exceeded Low (class 2) and the amount of days where the DC was moderate or higher ($DC \geq 3$) accounted for less than 25% 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.

It should be cautioned that McInnis Island is located on the low lying outer coast where conditions are different than the mountainous area surrounding Ocean Falls. The Hagensborg weather station is located in a sub-maritime climate and therefore is not a good indicator of the maritime conditions at Ocean Falls; however, it is prudent to modify interpretations of McInnis Island fire weather indices with information from Hagensborg during extended dry periods. Also, the Cathedral Point marine weather station is another source of raw weather data that is in the closest proximity to Ocean Falls. Daily weather recordings from Cathedral Point can be accessed at

www.weatheroffice.ec.gc.ca

The developed areas in Ocean Falls are primarily situated with a southerly aspect; however, the steep mountains to the south and west provide an ameliorating effect by providing early morning and late afternoon shading.

Fire danger is exacerbated during dry summer periods when in-flow winds from the south usually pick up during the afternoon. Described as moderate to fresh breezes, the winds are usually not as strong as they are further inland and not strong enough to cause wave action that prevents float planes from landing at Ocean Falls.

4.3 Fire History

There have been few fires in the immediate vicinity of Ocean Falls; 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 in near Kwatna inlet in 2003 and 2004. Two human caused fires that were less than 2 ha in size occurred in 2004 and in 2005 a fire that grew to 39 ha in size occurred in Johnston Channel along the power line connecting Ocean Falls to Bella Bella and Shearwater. Fuel loading was high as a result of routine vegetation control under the power line. 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. Local residents see this as a warning sign of changing climatic conditions leading to increased fire danger.

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 Ocean Falls 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 **moderate fire probability** in the Ocean Falls area (Appendix C).

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 Ocean Falls are untimely burning of debris, back yard camp fires, and the burning of trash at the garbage dump. House fires in the Martin river settlement may also spread to the forest. Other accidental ignition sources include transformer malfunction. With the main ignition

source being human cause, there is opportunity to reduce the occurrence of fire through education and due care.

Action: Develop education/information program to raise awareness of means to minimize risk of wildfire ignition and develop a system to inform the population about daily fire danger rating and the associated restrictions on 'hot work' activities and campfires. Establish a process to regulate the burning of trash at the dump during appropriate times.

4.5 Forest Fuels

The forest surrounding Ocean Falls is composed of western hemlock, amabilis fir, red cedar and Sitka spruce interspersed with patches of red alder in second growth areas. Most of the low elevation forest was logged or cleared in the early 1900's and regenerated naturally to dense stands of hemlock spruce and alder. Above 200-300 m elevation, the forest is primarily old growth.

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 D 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 located in Appendix E.

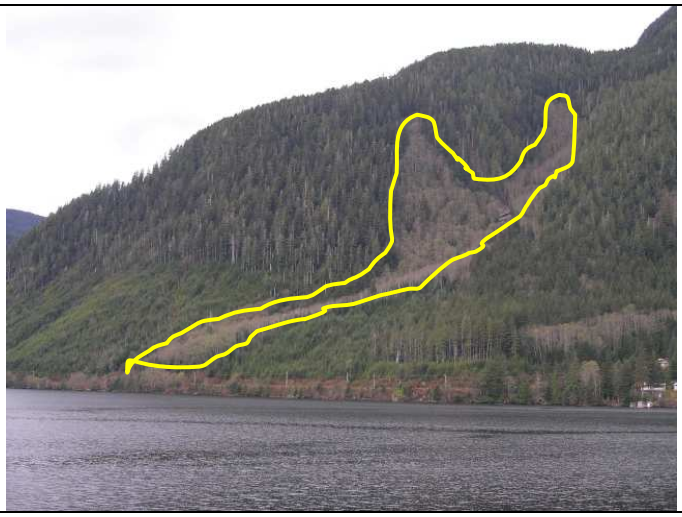
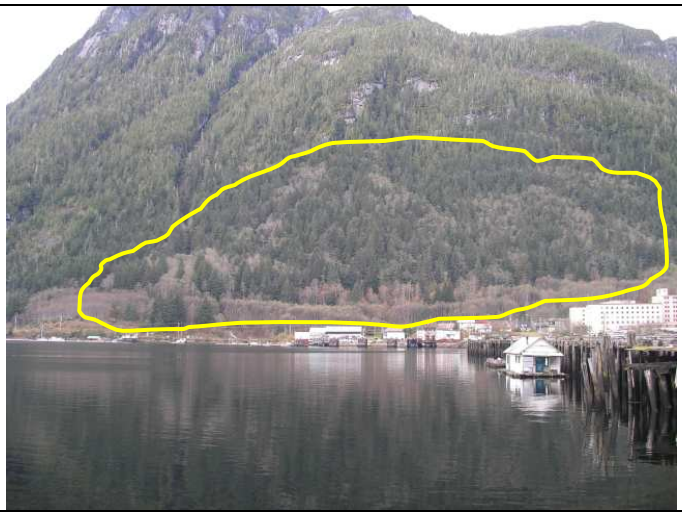
The Canadian Forest Fire Danger Rating System (CFFDRS), developed by the Canadian Forest Service, classifies forest fuels into 16 major types. Most of these classifications were developed in eastern and northern forests but in order to provide some consistency, attempts have been made

to best approximate the local fuels in terms of the CFFDR System. There are four fuel types in the vicinity of Ocean Falls.

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.

	**C2** • Coniferous saplings with minor alder. • 16-18 year old naturally regenerated clearcut. • Density > 3000 sph • Live crown is close to ground surface • 4-8 m height • Crown closure 30% • Pockets of coarse logging slash remain. • Low to moderate burning difficulty with high crowning hazard.
	**C3** • Coniferous • 80 year old second growth • HwSs 541 • 30 m height • Live crown top 30% • Crown closure 60% • 700 sph • Duff 15-25cm • Ladder fuels mainly along open edge of stand. • Moderately sparse understory • Low burning difficulty with moderate crowning hazard.

	**C5** • Coniferous old growth • HwCw(Ss) 841 • Variable canopy structure • 25-35 m tall • Crown closure 40% • Moderate understory vegetation. • Moderate to low burning difficulty with moderate to high crowning potential.
	**D1** • Deciduous – alder type • 20 m tall • 40 years old • Crown closure 80% • Low burning difficulty and low crowning hazard.
	**M2** • Mixed conifer/deciduous • HD 541 • 30 m tall • Crown closure 70% • Note higher proportion of deciduous along lower interface boundary. • Low burning difficulty with low to moderate crowning hazard.

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 be come 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 Ocean Falls would burn very intensely. This is due to the high amount of burnable biomass contained in these forests and the dominance of coniferous tree coverage. The Head Fire Intensity map is provided in Appendix G.

4.6 Density of Developments

In terms of the hazard assessment, Ocean Falls is classified as 'rural' and surrounded by continuous forest. In terms of values to protect, the Ocean Falls 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. Due to its smaller size and shape, the Martin River IFPU is a mix of complete and incomplete development and therefore has greater potential for fire spread throughout the community, not just along the perimeter.

In terms of density of developments, the Martin River settlement has a 'developed' density equivalent to 100-1000 buildings per sq km. The buildings at Ocean Falls are larger and more spread out and therefore it has 'mixed' density equivalent to 10-100 buildings per sq km.

4.7 Hazard Rating

Using the Wildland Urban Interface Fire Hazard Assessment methodology, Ocean Falls was determined to have a **moderate** interface fire hazard. Despite the differences between the two IFPU's, the rating for both units ended up being moderate. The Ocean Falls IFPU had a total score of 60, while the Martin River IFPU totalled 64, placing both units solidly in the moderate ranking. The reason for the slightly different score is due to the higher amount of deciduous trees around the perimeter of Ocean Falls compared to the Martin River settlement where conifers dominate and the broader interface zone at Martin River compared to the Ocean Falls where the perimeter structures are mainly at risk.

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.

Under the moderate hazard ranking, homes and structures are considered to be threatened by interface fire.

5 Emergency Operations

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

The Ocean Falls Improvement District operates a fire department with a handful of volunteers pursuant to the authority granted by the Province. The fire hall is located at the Martin River settlement where an 800 gl tanker truck is housed. 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 (except across the Link River bridge) so the pumper truck can reach all places. However, the ability to reach beyond the interface is limited to around 100 m.

Ocean Falls is fortunate in that the underground water system is still working and therefore there is 100% hydrant coverage at both the town site and at Martin River.

The fire department is focused on residential fires and has not been trained in forest fire fighting. In order to provide first response capability to fires started in the interface, basic forest fire fighting training should be conducted.

Recommendation: Conduct S-100 Basic Forest Fire Fighting training for volunteer firemen.

The Ministry of Forests and Range are relied upon to provide forest fire fighting protection as Ocean Falls does not have the people, equipment, resources or training to tackle anything but the smallest fire at the edge of the interface. 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 Ocean Falls 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 Ocean Falls emergency response personnel and MOFR Fire Protection Officer.

5.1 Available Fire Fighting Resources

Central Coast Power who operates the Ocean Fall hydro generation, has a variety of large machinery (excavators, loaders) that can be used to fight fires, however, they are located on the south side of the 10 ton bridge over Link River and therefore may not be able to access fires on the north side without the help of a barge.

Martin River Fire Hall

- 800 gallon pumper truck with hose and fittings.

Accommodation

- Bunk house accommodation is available to handle moderate sized crew (approximately 10-20 people).

6 Mitigation and Recommendation Summary

The main realistic opportunities to reduce interface wildfire in the vicinity of Ocean Falls is through public education to reduce risk of human caused ignitions; however, there are a number of simple mitigation treatments that can be applied, particularly at the Martin River Settlement. Much information on how people can 'Firesmart' their homes and properties is available on the government website:

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.
- The second growth forest immediately surrounding the Martin River settlement has a relatively low burning risk, however there are 'ladder' fuel conditions at the edge of the stand. Therefore, to reduce risk of fire 'crowning', trees along the forest edge 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.

Figure 4. Pruning and ladder fuel removal opportunity

- There is opportunity to improve a natural fire break between Ocean Falls and Martin River. A creek/brush tract intersects the forested slope from top to bottom and by thinning/removing the coniferous trees at the base of this tract, then the fuel break would be enhanced. The viability of this should be determined through prescription development.

Figure 5. Fuel break opportunity

- Immediately south of the Martin River settlement there is also a deciduous forest stand running vertically from high on the hillside to the main road (see D1 on page 16). This forest feature also presents a good fire break opportunity.

- 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:

8. Include interface fire management as one of the hazards that the local emergency response group considers and addresses.
9. Maintain road to Roscoe Inlet to serve as emergency evacuation route.
10. Develop backup power strategy to keep freezers from thawing out in case of prolonged power outage.
11. Develop education/information program to raise awareness of means to minimize risk of wildfire ignition and develop a system to inform the population about daily fire danger rating and the associated restrictions on 'hot work' activities and campfires.
12. Establish a process to regulate the burning of trash at the dump during appropriate times.
13. Conduct S-100 Basic Forest Fire Fighting training for volunteer firemen.
14. Strengthen routine and ongoing communication between Ocean Falls 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.

8 Bibliography

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Appendices

Appendix A – Ocean Falls 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