Special Investigation of Fire Hazard Assessment and Abatement

Interim Report – What did the surveys tell us?

INTRODUCTION

In early 2007 the Forest Practices Board began a special investigation of fire hazard assessment and abatement. As a first step, we surveyed all forest licensees in the province harvesting more than 100,000 cubic metres per year and all 12 British Columbia Timber Sales (BCTS) business areas.

Although BCTS is not responsible for hazard assessment and abatement activities, with over 1,100 registrants in the BCTS program we decided it would be most efficient to survey only the 12 business areas.

The purpose of the survey was to understand how licensees are meeting their fire hazard assessment and abatement obligations under the *Wildfire Act*, specifically assessment methods and abatement practices.

We found that licensees are taking several different approaches to hazard assessment and abatement and in some cases there are even differences between operating areas within the same company. Some respondents asked us what methods others were using to assess fire hazard. This interim report summarizes the results of the survey and provides examples of fire hazard assessments to those who may be interested.

The next part of the special investigation will examine a sample of practices on the ground to determine whether or not fire hazard assessments reflect conditions on the ground and if abatement practices are effective. Field work will begin this summer.

PARTICIPATION

We sent surveys to 76 licensees throughout British Columbia including all 12 BCTS business areas. Together, they represent approximately 79% of the allowable annual cut (AAC) in the province.

We received 48 responses from licensees and one from each of the 12 BCTS Business areas. This represents approximately 75% of the provincial AAC. Of the remaining 16 surveys, nine licensees did not respond; four licensees had not done any harvesting yet; one licensee was in receivership; one licence was surrendered; and one licence was being transferred.

Part 1 – Survey Responses from Licensees

Question: How do you assess fire hazard?

Assessment Method	No. of Responses
Post-June 1996 FFPSR Schedule 7(1)	11
1995 FFPSR Schedule 7 (2)	9
Assume high hazard. Pile and burn all debris(3)	9
Part of harvest inspection(4)	6
Custom form(5)	5
Arrow Forest Association fire hazard assessment form(6)	4
Informal (ocular) (7)	3
Exempt (8)	1
Total	48

Notes

1. After June 1996, the *Forest Fire Prevention and Suppression Regulation* (FFPSR) included a fire hazard assessment form which assigned point ratings to fuel loading factors including fuel depth, size and arrangement. The form appears in **Appendix A**.
2. In 1995, the FFPSR required fire hazard assessments to be "substantially" in the form of Schedule 7. In addition to fuel loading factors, Schedule 7 also included a "fire risk assessment" and a "values at risk" assessment. In 2006, the Protection Branch of the Ministry of Forests and Range provided internal hazard assessment guidance to its forest officers. The guidance contains the same assessment methods as the 1995 Schedule 7. Some licensees report that they are using the 2006 Protection Branch guidance. See **Appendix B** for the 1995 Schedule 7.
3. Licensees assume the fire hazard is high and pile and burn all debris. No assessment is done.
4. Licensees conduct fire hazard assessments as part of harvest inspections. Typically licensees ensure that roadside piles have been piled to a satisfactory standard and the result is documented on a harvest inspection form.
5. Five licensees have developed hazard assessment forms for their own use. Three assess the fuel hazard and the risk of a fire starting and spreading, and two assess the fuel hazard and the values at risk. The assessments are similar to those described in Schedule 7 of the 1995 FFPSR, but do not include all of the elements.
6. Members of the Arrow Forest Association developed a fire hazard assessment form that includes fuel loading factors identical to the post-June 1996 FFPSR Schedule 7, terrain factors including slope and aspect, and a risk assessment that considers adjacent values. Four licensees use the form. **See Appendix C**.
7. Informal assessments are done based on local knowledge, site conditions and experience. One licensee operates in very wet conditions on the coast with no public access which, in its opinion, does not require a formal hazard assessment.
8. One licensee received an exemption from fire hazard assessment requirements. It operates on the coast in areas that are moist to wet throughout the year, or have high levels of

annual precipitation. Many areas are isolated and the licensee considers that the fire hazard risk is low.

Question: Who does the assessment?

All licensees use staff or contractors to assess fire hazard. One licensee reports that Ministry of Forests and Range staff assists in assessing fire hazard.

Question: How do you ensure that a fire hazard assessment includes an assessment of the fuel hazard and its associated risk of a fire starting or spreading?

We asked this question because it is a requirement of section 11(4)a of the *Wildfire Regulation*. How could a licensee assess the risk of a fire starting or spreading? The fire risk assessment provided in Schedule 7 of the 1995 FFPSR provides one method – it includes factors that affect fire start and spread such as slope and aspect of an area, and the risk of ignition by lightning or man.

Response	**Number of Responses**
Completion of the fire hazard assessment form	30
No assessment done; all debris is piled and burned	7
Experience	6
No assessment done	2
Practices, e.g. pile and burn away from standing timber	1
Follow the site plan	1
Exempt from fire hazard assessment requirements	1
Total	48

Question: What practices are used to abate fire hazard?

All licensees report that they pile and burn debris. Other practices include site preparation (5 responses), broadcast burning (5), chipping (1), dispersing slash (1), and natural processes (1).

Question: How do you ensure abatement is effective?

We asked this question because it is a requirement of sections 12(2)(a) and (b) of the *Wildfire Regulation*.

Response	**No. of Responses**
Field review after abatement is complete	35
Field review and aerial review	3
Field review and infrared scanning to ensure fire is out	3
Aerial review	3
No further work done after abatement	2
Good piling practices to ensure a good burn	1
Not applicable (licensee has an exemption)	1
Total	48

Question: When burning piles or broadcast burning, how do you ensure that it is safe and is likely to continue to be safe to burn?

This is a requirement of sections 20(1)(b), 21 (1)(b), 22(1)(b), 23(1)(b) *Wildfire Regulation*.

Licensees report that they wait until the fall when there is wet weather or snow on the ground before burning. Some report practices include maintaining adequate fire guards, reviewing fire weather indices, complying with burning permit requirements and test-burning a small area.

Question: When operating in interface areas, do your abatement practices differ from non-interface areas?

Fifteen licensees report operations in interface areas. For the purposes of the *Wildfire Regulation*, this means operations are inside or within 2 km of a local government boundary or a fire protection district in a regional district. Twelve licensees report that their abatement practices differ in interface areas.

How do your abatement practices differ in interface areas?	**Responses**
Ensure good venting and communicate with the public	3
Ensure good venting	4
Notify local fire chief	1
Exercise greater caution, carefully monitor weather	2
Alternate abatement practices e.g. grind or rough bunch slash	2
Total	12

Question: Have you received an exemption from abatement requirements?

Ten licensees have received exemptions from hazard abatement requirements. The reasons for requesting exemptions include:

- Piles were left for wildlife habitat or posed a risk to standing timber if burned.
- Conditions for burning were not favourable and posed a significant risk of starting a forest fire.
- Late start to burning and an early snowfall prevented completion of abatement. In another area MOFR did not complete waste surveys in time.
- Extension to allow piles to cure for a year and also to permit wildlife research.
- Piles were placed on deactivated spurs and licensee operates in the very wet moist maritime zone. The risk was low.
- Extension because early, heavy snowfall prohibited burning.
- Slash piles provided wildlife habitat.
- Low risk situations and locations.

Part 2 - Survey Responses from British Columbia Timber Sales (BCTS)

BCTS is an independent organization within the B.C. Ministry of Forests and Range that auctions Crown timber. BCTS and its timber sale licensees have distinct responsibilities.

BCTS prepares operational plans and issues timber sale licences and road permits. It also takes on silvicultural obligations. Licensees harvest timber and build, maintain and deactivate roads. Licensees are also responsible for meeting the hazard assessment and abatement requirements of the *Wildfire Act*.

With over 1100 registrants in the BCTS program, we decided it would be most efficient to ask each of the 12 BCTS business areas about the fire hazard assessment and abatement activities of its licensees. In some business areas BCTS has a good understanding of the hazard assessment and abatement activities of its licensees. In others, they do not. This is to be expected as BCTS is not responsible for monitoring licensees for compliance with the *Wildfire Act* – that job falls to compliance and enforcement staff with the Ministry of Forests and Range.

The survey questions for BCTS were slightly different than the licensee questionnaire recognizing that BCTS is not responsible for hazard assessment and abatement.

Question: Do you provide any guidance to licensees about fire hazard assessment and abatement?

Guidance Provided to Licensees	**Number of Business Areas**
Discuss *Wildfire Act* obligations at pre-work meeting	1
Post-June 1996 Schedule 7	1
Discuss obligations at pre-work meeting and provide a post-June 1996 Schedule 7	3
2006 Protection Branch guidance(1)	1
Discuss obligations at pre-work meeting and provide Protection Branch guidance	2
Strait of Georgia fire hazard assessment procedure(2)	2
None	2
Total	12

Notes

1. In December 2006, the Protection Branch of the Ministry of Forests and Range provided internal hazard assessment guidance to its forest officers. The guidance, referenced above, contains the same assessment methods as the 1995 Schedule 7. It also describes how to measure each element.
2. The Strait of Georgia fire hazard assessment procedure is available at the following link: http://www.for.gov.bc.ca/ftp/TSG/external/!publish/EMS2/Supplements/Fire_Hazard_Assessment_Form.pdf . It is similar to the post-June 1996 Schedule 7, however it includes a field for the risk of ignition. It also provides guidance on how to assess fire hazard.

Question 2. How are licensees assessing fire hazard?

Assessment Method	Number of Business Areas
Completing a Schedule 7	3
Following Protection Branch guidance	1
Different licensees within a business area use various methods including completing a Schedule 7 or ocular assessments	1
Subjectively	1
Licensees are not assessing fire hazard	1
Unknown to BCTS	5
Total	12

Question: How do licensees ensure that a fire hazard assessment includes an assessment of the fuel hazard and its associated risk of a fire starting or spreading?

Method	Number of Business Areas
Completion of the fire hazard assessment form	6
Licensees are not assessing fire hazard	1
Unknown to BCTS	5
Total	12

Question: What practices are licensees using to abate fire hazard?

All business areas reported that licensees are piling and burning debris. Occasionally licensees may scatter debris or grind it up.

Question: How do licensees ensure that abatement is effective?

Method	Number of Business Areas
Licensees conduct field review after burning is completed	2
Licensees and BCTS review obligations before releasing the deposit	3
BCTS infra-red scans the piles	1
Unknown to BCTS	6
Total	12

Question: When burning piles or broadcast burning, how do licensees ensure that it is safe and is likely to continue to be safe to burn?

BCTS reports that licensees wait until the fall when there is wet weather or snow on the ground before burning. Reviewing fire weather indices and complying with burning permit requirements was also reported.

Question: Have Licensees received Exemptions from Abatement Requirements?

One business area reported that some licensees had been exempted from burning requirements.

Part 3 - Issues identified by Survey Respondents

We provided an opportunity for licensees and BCTS to provide additional comments about fire hazard assessment and abatement by asking the following questions:

Please feel free to add additional comments. For example, are you aware of any other activities besides forestry that are contributing to the fire hazard in your business area e.g. right-of-way maintenance? Do you feel that current policies and procedures in BC adequately address fuel hazard assessment and abatement?

The responses listed below are statements that we have not substantiated. We will consider these comments as we complete the field work and conduct follow-up interviews.

- There is no guidance regarding format or procedure for fire hazard assessments.
- Mountain pine beetle is contributing to the fire hazard.
- Hazard assessment and abatement are tied to other considerations within an operational plan – namely coarse woody debris (CWD) requirements. Operational plans require a specific amount of CWD debris to be left on site. In some instances the CWD requirements supersede hazard abatement within a block.
- There are very few hazard abatement options available. Other than a mechanical treatment (piling) and burning, there are no other practical or economical options available. It does not make sense to carry out a hazard assessment when no practical option to reduce the hazard exists. Limitations on smoke and high liability preclude hazard abatement on blocks with steep slopes (cable harvesting) where no in-block mechanical treatment is possible.
- The residue and waste policy seems off the mark when you consider all of the dead pine. It impedes efficient burning.
- For most coastal situations, current policies seem excessive. For example, although the *Wildfire Regulation* requires that assessments be done every 6 or 3 months depending on interface proximity, fire hazard continues to decline through natural processes following harvesting or abatement activities, thus making reassessment of little utility. Similarly, the policies impose hazard assessments of very low hazard BEC zones with low lightning incidence and in remote locations with little if any public access.
- Policies are not aligned. The *Open Burning Smoke Control Regulation* is very restrictive for using fire as a hazard abatement tool.
- It would be good to be able to leave a block for more than a year to allow fuel to cure and fine fuels to break down however government does not seem to want to carry the risk.
- Mountain pine beetle slash is a challenge to burn near urban areas.
- Coarse woody debris and hazard abatement objectives often conflict.
- The largest impediment to keeping current with hazard abatement is the requirement to burn when the venting indices are good.

Appendix A

SCHEDULE 7
[am. B.C. Reg. 148/96, s. 8.]
FIRE HAZARD ASSESSMENT
(section 31)

POST HARVESTING

Fuel Loading Factors	**Site Characteristics and Point Ratings**			
1. Fuel Depth	<20 1	20 to 40 cm 3	40 to 60 cm 5	>60 cm 7
2. Fuel Size (% of all fuels that are <7.1 cm)	<15% 1	15 to 30% 3	31 to 45% 5	>45% 7
3. Horizontal Fuel Arrangement (% of area)	Fuel coverage <20% 1	Fuel coverage 20 to 50% 3	Fuel coverage 51 to 80% 5	Fuel coverage >80% 7
4. Vertical Fuel Arrangement (fine fuels <7.1 cm)	Mixed with soil 1	On ground 3	Partially elevated 5	Mostly elevated 7
5. Vegetation (Contributes to Fuel Load)	None 0	Low 1	Moderate 3	High 5
6. Cedar Slash Component	<20% 1	20 to 40% 2	41 to 60% 3	>60% 4
			Hazard Assessment Subtotal	

Note: This regulation repeals B.C. Reg. 139/81, the Forest Fire Fighting Compensation Regulation, and B.C. Reg. 52/92, the Forest Fire Prevention Regulation.

Fire Hazard Assessment

POST HARVESTING

Fuel Loading Factors	Site Characteristics and Point Ratings			
1) Fuel Depth	<20 1	20 to 40 cm 3	40 to 60 cm 5	>60 cm 7
2) Fuel Size (% of all fuels that are <7.1 cm)	<15% 1	15 to 30% 3	31 to 45% 5	>45% 7
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4) Vertical Fuel Arrangement (fine fuels <7.1 cm)	Mixed with soil 1	On ground 3	Partially elevated 5	Mostly elevated 7
5) Vegetation (Contributes to Fuel Load)	None 0	Low 1	Moderate 3	High 5
6) Cedar Slash Component	<20% 1	20 to 40% 2	41 to 60% 3	>60% 4
			Hazard Assessment Subtotal	

Fire Risk Assessment

Fire Risk Factors	Factors Affecting Fire Risk and Points Rating			
Site Information 1) Size of Area	<20 ha 1	20 to 40ha 2	41 to 60 ha 3	>60 ha 4
2) Aspect of Area	N, NE 0	NW, E 1	W, SE, level, variable 2	S, SW 4
3) Slope (top third of block)	<20% 1	20 to 35% 2	36 to 45% 3	>45% 4
Area Information Adjacent Slash - % Perimeter Not Abated (or landings only)	None 0	<15% 2	16 to 40% 4	>40% 6
Risk of Ignition 1) Lightning	Low 2	Medium 6	High 10	Extreme 14
2) Person (excluding industry)	Low 1	Medium 2	High 3	Extreme 4
3) Industry Operations present or planned within 5 years and 1 km of site	None 0	Planting Surveys 1	Site Prep. Mining 2	Log, Spacing Small Eng. 3
4) Access (present or planning within next 5 yrs. (Ind. and Rec.)	Foot 1	A.T.V. 2	4 x 4 3	2 x 4 4
5) Proximity to 2 x 4 road	> 5 km 0	3 to 5 km 1	1 to 3 km 2	< 1 km 3
6) Danger Class 3 or better	< 30 days 1	30 to 50 3	50 to 70 5	> 70 days
			Fire Risk Assessment Subtotal	

Values At Risk Assessment

Values at Risk Factors	Factors Affecting Values at Risk and Point Rating			
Life and Property 1) Distance from Populated Areas (continuous burnable fuels - ie. no significant natural fire breaks)	> 10 km 0	3 to 10 km 4	1 to 3 km 8	< 1 km 12
2) Size of Development (within 10 km)	No Development Campsite 0	Rural Home Park Facility 4	Rural Subdivision Small Resort 8	Village Municipality Large Resort 12
Timber Values 1) Primary Contributor to A.A.C. (within 2.5 km)	None or < 250 ha 0	Over Mature > 250 ha 2	Mature > 250 ha 4	Immature > 250 ha 6
2) Silviculture Investments (within 2.5 km)	< 250 ha 0	250 - 500 ha 1	500 - 1000 ha 3	> 1000 ha 6
3) Silviculture System (on site)	Clearcut NSR 0	Clearcut with Seedtrees 2	Clearcut SR 4	Selection Shelterwood 6
4) Slope Position	Top 1/3 or Adjacent to Oper. Lines 1	Middle 1/3 2	Bottom 1/3 3	Valley Bottom 4
5) Valley Orientation	Secondary Back 1/3 1	Secondary Middle 1/3 2	Secondary Front 1/3 3	Main Valley 4
Water Quality (Downstream Domestic Use)	No Use or Agriculture only 0	Single Dwelling 4	Rural Subdivision Small Resort 8	Comm. Wat. Large Resort Village 4
Habitat (within 2.5 km) 1) Wildlife	Beneficial or No concern 0	Low 1	Moderate 3	High 5
2) Fish	0	1	3	5
Visual/Aesthetics (Visual Quality Objectives)	Maximum Modification 0	Modification 3	Retention 5	Preservation to Retention 7
Cultural (Historical or Archeological Sites)	> 10 km 0	3 to 10 km 1	1 to 3 km 3	< 1 km 5
			Values at Risk Assessment Subtotal	

Hazard/Risk Acceptability Evaluation

HAZARD/RISK ASSESSMENT SUMMARY

	Hazard Subtotal	Fire Risk Subtotal	Values at Risk Subtotal
Assessment Points			

MAXIMUM ALLOWABLE SLASH HAZARD FROM FOREST HARVESTING

(1) When the Hazard Assessment Points from harvesting slash exceed 14 and

(a) the Fire Risk exceeds 24, or

(b) the Values at Risk exceed 29

the fire hazard rating must be reduced to 14 or less.

(2) Slash accumulations created during the process of hazard reduction must be disposed of unless other resource management objectives require the debris to be left on site.

(3) All landing and R/W debris (including processor debris) within harvested areas must be disposed of unless other resource management objectives require the debris to be left on site.

HAZARD/RISK REDUCTION METHODS

Hazard/Risk Reduction Method	Point Reduction	Method to be Used
Hazard Reduction		
1) Prescribed Fire		
Broadcast Burn	50 to 80%	
Windrow and Burn	50 to 80%	
Windrow - No Burning	0%	
Bunch and Burn - 100% of area	50 to 80%	
Bunch - No Burn	0%	
Bunch and Burn - Roadside slash for 30 m	20 to 40%	
Under Burn	50 to 80%	
Spot Burn Accumulations	5 to 15%	
2) Mechanical Site Prep.		
Drag Scarify	10 to 25%	
Disc Trench Scarify	10 to 25%	
Blade Scarify	10 to 25%	
Trampling and Crushing Slash	10 to 20%	
Bucking and Limbing/Lop and Scatter	5 to 20%	
V Blade, Ploughs	0 to 10%	
Excavators, Mounders	0 to 10%	
Spot or Patch Scarify	0 to 10%	
Hand Held Spot Scarifier	0%	
Mulching or Chipping - 100% of area	50 to 80%	
- Roadside slash for 30 m	20 to 40%	
3) Utilization		
Full tree skidding	20 to 50%	
Clean Skid	20 to 50%	
Increase Utilization Standards	20 to 50%	
Minor Products (throughout area)	5 to 30%	
Chip and Haul	5 to 40%	
Hog and Pellet Fuel	5 to 40%	
Firewood	5 to 10%	
Post and Rail	20 to 50%	
Grape Stakes	5 to 30%	
Shakes (rearranges fuel and significantly adds to the amount of fine fuels left on site)	Increase hazard pts. 5 to 10%	
Hazard Points Reduction %		
Risk Reduction		
1) Access Restriction		
Road Closure	10 to 25%	
Access Controlled by Signs	5 to 10%	
2) Informing Area Users		
Hazard Warning Signs	5 to 10%	
Risk Points Reduction %		

ADJUSTED HAZARD ASSESSMENT

	Original Assessment Point	Point Reduction % (above table)	Net Assessment Points
Hazard			
Fire Risk			
Values at Risk			

Note: *This regulation repeals B.C. Reg. 139/81, the Forest Fire Fighting Compensation Regulation, and B.C. Reg. 52/92, the Forest Fire Prevention Regulation.*

[Provisions relevant to the enactment of this regulation: *Forest Practices Code of British Columbia Act* – sections 198 and 214; *Employment Standards Act*, section 105]

Appendix C Fire Hazard and Risk Assessment

Licence: _____ **Cutting Permit:** _____ **Block:** _____

Hazard Assessment

Fuel Loading Factors	Site Characteristics and Point rating			
Fuel Depth	< 20 cm 1	20 to 40 cm 3	40 to 60 cm 5	>60 cm 7
Fuel Size (% of all fuels that are <7.1cm)	<15 % 1	15 to 30 % 3	31 to 45 % 5	>45 % 7
Horizontal Fuel Arrangement (% of area)	Fuel Coverage <20 % 1	Fuel Coverage 20 to 50% 3	Fuel Coverage 51 to 80% 5	Fuel Coverage <80 % 7
Vertical Fuel Arrangement (fine fuel < 7.1 cm)	Mixed with soil 1	On ground 3	Partially elevated 5	Mostly elevated 7
Vegetation (contributes to fuel load)	None 0	Low 1	Moderate 2	High 3
Cedar Slash Component	<20 % 1	20 to 40 % 2	41 to 60 % 3	> 60 % 4
Terrain Factors				
Slope	> 10 % 1	11 to 30 % 3	31 to 50 % 5	> 50 % 7
Aspect	N, NE, NW 1	E, W 2	SE, level or variable 5	S, SW 7
Special Factors (water within block, elev, BGC zone etc.)	This factor rates from -3 to +4 to cover the following situation: _____ _____			Points(+/-)
Low = < 20 Moderate = 21-26 High = 26+			Hazard Assessment Total	

Low = < 20 points - no action required unless risk is Very High
Moderate = 21- 26 points - no action required unless Risk is High or Very High
High = >26 points - Hazard abatement required

Risk Assessment

Adjacent Values	Risk and Point Rating				
	Very Low	**Low**	**Moderate**	**High**	**Very High**
Dwellings / communities	>10 km 0	5km to 10km 1	2km to 5km 2	1km to 2km 4	< 1km 8
Private Property (not occupied)	>5 km 0	3km to 5km 1	1km to 3km 2	500m to 1km 4	< 500m 6
Utilities (Powerlines/telephone etc.)	>5 km 0	3 km to 5km 1	1km to 3km 2	500m to 1km 4	< 500m 6
Plantations (within 1km)	> 1 yr 0	1-5 yrs 1	5-15 yrs 2	15-40 yrs 3	40+ yrs 5
Public Use	None 0	Low 1	Moderate 2	High 3	Very High 4
Special Factors (high % of dead timber adjacent to block, fuel breaks, etc)	This factor rates from -3 to +4 to cover the following situation: _____ _____				points(+/-)
Low = < 6 Moderate = 6-10 High = 10-18 Very High = 18+			Risk Assessment Total		

Comments:

Assessed by: _____ Date: _____