



Fuel Management Proposal Bear Lake



Deliver or Mail to: Prince George Forest District Prince George, BC, V2L1P8 District Manager: Greg Rawling Protection Officer: Harry Offizier	For office use only (Date received by District Manager)
--	--

Prepared by: Bruce Blackwell, RPF	Contact information: 3087 Hoskins Rd, North Vancouver, BC, V7J3B5 Ph: 604-985-8769 Email: bablackwell@bablackwell.com
Location (Map attached)	This unit is located adjacent to Hart Hwy, Bear Lake 93J057/93J047

A. TENURE IDENTIFICATION

FLTC: A86402	CLIENT NO: 00147061	ESF SUBMISSION ID: 693845	LICENSEE NAME: REGIONAL DISTRICT OF FRASER-FORT GEORGE
TIMBER MARK: 86402	MAPSHEET: 93J057/93J047	LOCATION: BEAR LAKE	
TERM REQUESTED FOR LICENCE:	1 year	COMMENTS: Treatments are scheduled for completion within one year. Field marking convention: Falling boundary ribbon is both orange and black striped and white and blue striped. Corners are painted in pink and labelled with a metal tag stating block name, falling corner and date.	

B. AREA SUMMARY

Gross Area (Ha)	4.2		
Net Treatment Area (Ha)	4.2		
Reserve Zones (Ha)	0		
TU	Area Description	NAR (ha)	Treatment
A	SBSmk1-01 PI (Sxw)	4.2	Complete Pine Removal
<i>Critical site conditions that affect the timing of operations:</i> The harvest is to occur only when soil is dry or frozen, or when adequate snow pack exists to minimize soil disturbance.			
<i>Safety:</i> These units are within the Community of Bear Lake and adjacent to busy public roadways and private land. Appropriate precautions must be taken to ensure that safety of workers, the public and road users is maintained during the operations. All units should be assessed for overhead clearance hazards to machinery prior to commencement of work.			

C. SITE PLAN OBJECTIVES

This site plan is consistent with the Bear Lake Community Wildfire Protection Plan. This site plan is consistent with Higher Level Plan objectives that include:

- Protection of public safety both within and adjacent to the Community;
- Enhancement of the ability of Fire Rescue to protect both public and private property at risk within the Community;

- Improvement of the ability of the Community to protect both life and property values at risk;
- Enhancement of natural barriers that reduce the continuity of fuel loads and wildfire risk;
- Removal of lodgepole pine that has been attacked and killed by the continuing mountain pine beetle outbreak and could pose a hazard to people and property;
- Improvement in biodiversity of wildlife habitat through the establishment of early seral forests.

Specifically, within a five year period this site plan will:

- Address the removal of overstory trees to reduce identified fire risk to the Community of Bear Lake;
- Address rehabilitation of forests impacted by the mountain pine beetle;
- Minimize negative impacts on the aesthetic values, cultural values, soil, non-targeted vegetation, water and air quality and wildlife;
- Meet or exceed the stand level planning and practice requirements of the Forest and Range Practices Act; and,
- Address rehabilitation of disturbed areas upon project completion.

D. SOIL DISTURBANCE

TU	Hazard Ratings			Maximum Allowable Soil Disturbance (%)	Sensitive Soils (Y/N)	Texture	Coarse Fragments
	Soil Compaction	Soil Erosion	Soil Displacement				
A	L	L-M	L	<10%	N	S	<35%

Soil Conservation Comments: The soil protection objective is to minimize site disturbance and potential long term productivity losses. No permanent roads will be constructed. Any temporary roads constructed as part of treatment operations will be rehabilitated. All removal operations are restricted to dry periods (to be determined by the contract monitor) and/or winter conditions when the ground is frozen. The site is not within a Community Watershed. Slope stability is not a concern within the treatment area.

E. SILVICULTURAL/ TREE REMOVAL SYSTEMS

Treatment Units (TUs)	Area (ha.)	Harvest method	Non-Harvesting Treatments
A	4.2	Complete Pine Removal (Clear-cut with single tree retention)	Removal of non-merchantable timber Pile and burn/Chip and remove
Silvicultural Constraints		Minimize scarring and marking on overstory leave trees, protect regeneration.	
Harvesting Constraints		Harvesting to occur during periods of dry conditions and or when the ground is frozen. Acceptable conditions to be determined by the contract monitor.	

Timber proposed for removal	Species and volume (m3)			Total
	PI			
Dead or down	294			294
Endangered	42			42
Live (interspersed)	25			25
Live (access)	-			-
Total volume planned for harvest (insert in paragraph 1.03 of the FLTC)				361

Note: "endangered" means timber that is damaged or attacked by insects and can reasonably be expected to die within one year. No green attack was located within the cruise plots; however some was observed during the walkthrough.

F. REVIEW AND APPROVAL INFORMATION

The following information is required for the Ministry to assess this fuel management proposal. It is the responsibility of the signing professional or technician to ensure this information is complete and accurate. Some of the information provided may be included in a Forestry Licence to Cut that may be issued as a result of this fuel management proposal.

LAND STATUS, FOREST PLANNING, MAPPING AND REFERRALS	
Appropriate investigations have been conducted to ensure that the area included in the prescription is vacant Crown land. The area proposed does not overlap or conflict with private land, an Indian reserve, a park or protected area, and is not otherwise encumbered in a manner that would prevent issuance of a Forestry Licence to Cut.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
This application is consistent with a Community Wildfire Protection Plan for the area. If there is no CWPP for the area, BCFS Protection staff must have signed off on the proposed treatment.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Map(s) are attached and comply with the standard required.	Yes <input checked="" type="checkbox"/>
A map using IGDS format has been produced and a digital file has been submitted to the MOF.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
The proposal has been referred to the appropriate major licensee and BCTS and documentation of the response is available indicating no significant reasons to prevent the proposed operations.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
The major licensee and/or BCTS have been provided with an accurate location and assessment of potential impact on silviculture from use of trails and landings in plantations.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
A field assessment has been conducted and all resource values that could be materially affected by this fuel management proposal have been appropriately addressed.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>

<i>The area has been checked for the following values and features and appropriate management is described below if an issue is noted.</i>	
Other leases, licences or permits:	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Mining, petroleum or other sub-surface or surface tenures:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Ungulate winter range:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Wildlife habitat areas:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Lakeshore management zone (consistent with any lakeshore management zone objectives):	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Visual Quality (check 'No' if the cutblock is not consistent with visual quality requirements): Overlapping VQO polygons 1305, 1307, 1309, 1272 are partial retention	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Community watershed:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Domestic water licence intakes or water delivery infrastructures that might be affected:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Old Growth Management Areas:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Forest Ecosystem Networks:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Range tenures: fences, natural range barriers –(referral required if harvesting within a range tenure):	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Recreation resources, features, recreation site, forest interpretive site or recreation trail: No mapped recreation resources are noted in the units but two mapped recreation trails are adjacent to the units.	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Archaeological Resources:	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Cultural Heritage Resources (Referral required to appropriate First Nations):	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Wildlife habitat features: [Must comply with FPPR s. 70(2) unless exempted under section 92(2)]	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Resource features: [Must comply with FPPR s. 70(1) unless exempted under section 91(1)]: a KARST potential area is mapped immediately adjacent to the treatment area but does not overlap.	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Other(specify) Non-sensitive CDC Element:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Written comments received from public review or referral:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Issue: Other leases, licences or permits	Guide outfitter area: Guiding certificate No: 700627, Dirk Schuirmann Non-pine trees will be retained where possible up to a target crown closure of 35% and understory trees will be protected/retained.
Issue: Archaeological Resources	An archaeological impact assessment was conducted by Archer CRM (Elissa Gagnon, Archaeologist) for TUD. The report is dated August 25, 2008 and was authored by Dana Evaschuk. In-field archaeological potential was considered high based on proximity to Duck Lake but all subsurface tests were negative and no CMTs were identified. Given high archaeological potential, all harvesting activities will take place when soil is dry or frozen or an adequate snowpack exists to prevent soil disturbance. No harvesting will occur within the RRZ. In accordance with the recommendations made in the Archer AIA report, if archaeological materials or other heritage remains are uncovered during construction, work in the area of the find must immediately cease and the project supervisor is to be notified. The project supervisor will notify the MOFR and the relevant First Nations of any unanticipated archaeological findings.
Issue: Cultural heritage resources	Referrals have been completed by the Ministry of Forests and Range.
Issues: Written comments from public review	Written comments have not been collected but this process arises out of the CWPP process and has the full support of both the Regional District and the Bear Lake Community Commission as can be demonstrated in records of meeting minutes and resolutions.

BOUNDARY, ROAD, LANDING, AND TRAIL	
Block boundaries are clearly marked on site and accurately mapped.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
The condition of existing trails will be assessed and documented prior to harvest after consultation with the contractor undertaking the work.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Existing roads and landings are in a condition suitable for use without modification.	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Proposed road construction in the FLTC area is shown on map (including reconstruction of deactivated or non-status roads)	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Road use is to be authorized by the FLTC and such roads must also be identified on the map.	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Trails will be marked in the field prior to harvest after consultation with the contractor undertaking the work. Trails will be GPS'd and incorporated into harvest maps.	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>

STAND ATTRIBUTES									
A bark beetle survey has been conducted in a manner consistent with the district forest health strategy or locally established guidelines.	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>								
Harvesting will be limited to intermediate cutting without regeneration objectives and the area will retain a stocked stand that meets the post harvest stocking and quality characteristics described in Table 1 (The establishment of a free growing stand is not required).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>								
Partial cutting will be carried out to retain a stand that meets the post harvest stocking and quality characteristics described in Table 1 (The establishment of a free growing stand is required).	Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/>								
Upon completion of harvesting it is proposed that a free-growing stand will be established in accordance with the stocking requirements and dates described in Table 2 below.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								
All clearcut areas will be < 1 ha. (including consideration of adjacent areas) [FPPR section 46(3)(a)]	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>								
Pre-Harvest Stand Structure									
LAYER	SPECIES	Comp %	SPECIES	Comp %	SPECIES	Comp %	SPECIES	Comp %	Volume (m3/ha)
MATURE	PI	90	BI	10					85
LAYER	SPECIES	SPH	SPECIES	SPH	SPECIES	SPH	SPECIES	SPH	Stems per Hectare
POLE									
SAPLING									
REGEN	PI	75	BI	25					300-500

Table 1: Stocking Standards, and Quality Characteristics of trees that are to be retained at the completion of harvesting. (In accordance with FPPR section 46(3)(b)(i), the holder of the FLTC will ensure that at the completion of harvest, the trees retained on the harvested area will conform to the specifications below).

TU		Post Harvest Stand Structure									
TUA	Trees to be Retained	Species Composition	All deciduous and conifer tree species other than PI are preferred species. Low numbers of susceptible lodgepole pine trees (< 10/ha) and PI < 10 cm dbh can be left for biodiversity, recruitment of wildlife trees and snags.								
		Quality Characteristics	Trees are to be free of diseases that could result in mortality. Trees with defects and diseases that will not result in mortality are acceptable.								
		Crown class or Size	All healthy BI that will not pose a hazard to roads or trails if windthrown. All deciduous. Some PI < 10 cm dbh. All regeneration is to be protected and retained where possible.								
Post Harvest Stand Structure											
		TARGET WELL SPACED TREES/HA (must be filled in)				PLANNED RESIDUAL BASAL AREA (m ² /ha)	TARGET TOTAL STEMS PER HECTARE (must be filled in)	HEIGHT RELATIVE TO COMPETITION (% or cm)			
		LAYER	TARGET PREF & ACC	MINIMUM PREF & ACC	MIN PREF	MIN HORIZ DISTANCE PREF & ACC	(sum of mature and pole)	TOTAL STEMS PER HECTARE			
		MATURE					0				
		POLE									
		SAPLING									
		REGEN	500	200	150	1.0		500	200		
Notes: Minimise scarring and marking on retained trees. Allow for natural variation in retention patterns throughout the treatment units.											

Table 2: Stocking Standards (In accordance with FPPR section 46(1), the holder of the FLTC will ensure that a free growing stand in the net area to be reforested that conforms to the stocking standards below).

Zone	Var	Site Series	MITD (m)	Stocking Standards																	
				Company ID	Max Regen Delay (yrs)	Target WS (sph)	Min WS (sph)	Sp1	Ht1 (m)	Sp2	Ht2 (m)	Sp3	Ht3 (m)	Sp4	Ht4 (m)	Sp5	Ht5 (m)	Sp6	Ht6 (m)	Sp7	Ht7 (m)
SBS	mk1	01/04/05/07	1.0	SBS 1	7	500	200	PLI	2.0	SX	1.0	FDI	1.4	BL	1.0	Ep	2.0	At	2.0	Act	2.0

An assessment of regeneration performance and stocking will be conducted during a walkthrough following tree removal to determine regeneration success and performance. The treatment will be considered a success if variable stocking ranging from 200 to 500 stems/ha is achieved. If regeneration densities exceed 600 stems/ha over more than 50% of the area, a stocking control treatment may be considered. If regeneration densities fall below 200 stems/ha over more than 50% of the area, planting may be considered.

RIPARIAN MANAGEMENT & BIODIVERSITY	
Streams, wetlands and lakes are correctly classified and indicated on the map.	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Appropriate timing for removal of any skid trail crossings of streams and non-classified drainages is identified:	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Harvest in RMA is consistent with Forest Planning and Practices Regulation (s. 52(1) may not apply)	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Harvest is planned in the RMZ identified on the map (describe the post harvest stand structure, trees to be removed or provide a table similar to Table 1)	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/> No <input type="checkbox"/>
RRZ's have been marked in the field to prevent harvest (if No, complete the next row of this table)	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/> No <input type="checkbox"/>
Harvest is planned in an RRZ identified on the map (describe the post harvest stand structure, trees to be removed or providing a table similar to Table 1)	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Wildlife tree retention Must provide 7% wildlife tree retention unless exempted under FPPR s. 91: Where appropriate individual trees may be left as wildlife trees to maintain biodiversity values. Additionally, some dead trees may be retained if they are not considered a public safety hazard.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

SEASONAL CONSTRAINTS AND SLOPE STABILITY	
All season harvest recommended for this site (low potential for Archaeological Resources and suitable soil conditions)	Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/>
The harvest is to occur only when soil is dry or frozen, or when adequate snow pack exists to ensure minimal soil disturbance to sensitive soils. Maximum Soil Disturbance Limit: 10 %	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
The prescribed harvest area has been field assessed by an archaeologist and no further archaeological work is prescribed. Forest practices will proceed as per archaeologist's recommendations.	Yes <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Primary forest activities under this fuel management proposal will not materially reduce slope stability on the area or on adjacent areas.	Yes <input checked="" type="checkbox"/>

NOTICE OF SPECIAL CONCERNS FOR THE DISTRICT MANAGER TO CONSIDER

Include any requests for exemptions or variances

Allow non-merchantable timber to be bucked for firewood and stacked at roadside for collection by Bear Lake residents.

NON-HARVESTING FUEL MANAGEMENT TREATMENTS

Slash Disposal:

Pile and Burn	Slash will be piled and burned on-site for disposal. Residual slash loading should not exceed 5kg/m ² (50 tonnes/ha). Where there is any retained tree cover, thinning and/or slash should be pulled to the roadside/landing/open area and burned to minimize any potential scorch of residuals. Burning is to be completed while there is still snow on the ground.
Chipping	If pile and burn is not feasible, slash will be chipped and removed from the site for disposal. Residual slash loading should not exceed 5kg/m ² (50 tonnes/ha). Chip and remove debris at roadside. The Ministry of Forests and Range must assess waste levels on the site prior to chipping and removal.
Buck and Pile	Non-merchantable timber greater than approximately 6 inches will be bucked (lengths not exceeding 1.5 m) and piled along trails or roadside where it is accessible for community firewood collection. All other material will be piled and burned, or chipped and removed from the site.

COARSE WOODY DEBRIS MANAGEMENT STRATEGIES

Comments: Current levels of surface coarse woody debris are low throughout the site plan area. In all units, target 10 pieces/ha > 12 cm diameter and > 5 m in length distributed randomly throughout the area. Of the CWD retained, approximately 2/3 will lie flat to the forest floor and 1/3 can be elevated.

Description of Other Treatments: It is expected that this fuel treatment will significantly reduce wildland urban interface fire risk for a period of up to 25 years. After this time it is expected that the pole sapling stage and possibly understory regeneration will create ladder fuels that are likely to increase the crown fire hazard. Maintenance at this time may include pre-commercial and understory thinning removal to maintain the effectiveness of the treatment and public safety. Given our limited understanding of the longevity of these types of treatments, a number of permanent photo plots will be established to monitor treatment outcomes.

Fuel Management Objectives

- Removal of the dead beetle killed and susceptible lodgepole pine to protect public safety
- Overstory tree removal to be restricted to dead/susceptible lodgepole pine and danger trees
- All deciduous tree species will be retained to facilitate maintenance of biodiversity

- Minimize the creation of surface fuel by limiting slash accumulations to < 5 kg/m²

Tree Removal Objectives

- Minimize soil disturbance (<10 %) and forest floor displacement
- Removals will be done only when soil conditions are dry and or frozen and covered by snow
- Minimize visual impact of harvest – stumps cut close to the soil surface (less than or equal to 20 cm height)
- Do not fall trees within 1.5 tree lengths of BC Hydro lines

Rehabilitation Objectives

- If unacceptable levels of soil disturbance are identified, the contract monitor will develop an appropriate rehabilitation plan

RPF PRINTED NAME		Registered Professional Foresters Signature and Seal
Bruce A. Blackwell	RPF 2073	
DATE SIGNED		
November 15 th , 2009		
I certify that I have reviewed this document and I have determined that this work has been done to standards acceptable of a Registered Professional Forester.		
ACKNOWLEDGEMENT BY LOCAL GOVERNMENT REPRESENTATIVE		
I certify that I have reviewed this fuel management proposal, all assessments and fieldwork. I agree it is consistent with the recommendations contained within the Community Wildfire Protection Plan, or with the objective of reducing fire hazard in the community interface area.		
Signature:		
REPRESENTATIVE NAME:		DATE SIGNED:



Figure 1. Dead pine dominated stands in TUA.

