

Fuel Management Site Plan

PROJECT IDENTIFICATION				
Forest District	TSA	Tenure Holder(s)	UTM Zone Location (UTM)	Map Reference No.
Cascades	Merritt		UTM 658922, 5557328 UTM Zone 10N	092I_017_1
Geographic Location		Swakum Mountain Forest Service Road		
Road Permit(s)		FSP ID		Total Area (ha)
				42.9
Higher Level Plans		Integrated Stewardship Strategy for the Merritt TSA		
Access		Take Swakum Mountain Forest Service road off of the Highway 5A North of Merritt. From the beginning of the junction off of the highway, stay on this road and cross under the culvert under the Coquihalla. Continue up this road, and bear left at the junctions at 2.5 km, 4.5 km, and 6 km. At 7.5 km, take a right- The block will begin on either side of the road at 8.5 km.		

AREA UNDER PLAN						
Gross Area	PAS	NP	WTRA/WTP	Reserves	Other	NAR
42.9	.9					N/A

ECOLOGY and SITE CONDITIONS										
SU	Area	BEC	Elevation			Slope (%)			Site Series	Aspect
			Low	High	Average	Min	Max	Average		
A	42.9	IDF xh 2	1080	1200	1150	0	35	20	05	SE

TREATMENT RATIONALE	
<p>This site has elevated fuel loading as a result of historical fire exclusion. This may result in increased fire behavior characteristics such as headfire intensity, with an increased chance of ecological damage as a result. This treatment intends to mimic the natural mixed severity fire regime of this BEC zone by removing suppressed understory trees, and increasing the crown spacing of the stand.</p>	
FUEL MANAGEMENT OBJECTIVES	
<ul style="list-style-type: none"> To reduce potential wildfire impacts from excessive fuel loadings; To retain and enhance unique wildlife habitat features located in this area; To retain the healthy live trees and regeneration; To create safer wildfire suppression opportunities; and To provide for ecosystem restoration objectives. 	
<p>While this treatment is not intended to be a landscape level fuel break due to its strategic location and the adjacency of untreated fuels, it will provide suppression opportunity and contribute to landscape resiliency through a reduction in wildfire behavior.</p>	

VALUES – RESULTS & STRATEGIES			
Result/ Strategy/ Measure	Act/ Reg.	Applicable	How it Applies to the Site
Old Growth Management Objectives	FPPR sec. 9 and 14	No	This is not within an Old Growth Management Area.
Soils	FPPR sec. 5, 12.2, 35 and 36	Yes	These prescriptions will not unduly impact hydrologic function and soil integrity.
Wildlife: Species at Risk	FPPR sec. 7	Yes	<p>This area is within ungulate winter range u-3-003 shallow snowpack zone. As per the General Wildlife Measures (GWM) as described in the GAR order document, Snow Interception Cover (SIC) must be within the 15 % retention area of the planning cell.</p> <p>This prescription intersects three planning cells- two planning cells (335 and 374) are within the acceptable range for SIC. One cell, (352) has an SIC deficit of 8.09 %. This prescription will require engagement with the Habitat section of MFLNRORD to determine whether exemption from the GAR order for the purposes of wildfire hazard reduction will be acceptable in this planning cell.</p> <p>Please see attached UWR planning cell tables and map for details.</p>
Water, Fish, Wildlife and Biodiversity within Riparian Areas: General	FPPR secs. 8, 12.3(1) to (5) and (7)	No	There are no riparian areas in this unit.
Water, Fish, Wildlife and Biodiversity within Riparian Areas: Retention of Trees in Riparian Management Zones	FPPR secs. 8, 12.3(3) and (6)	No	There are no riparian areas in this unit.
Wildlife and Biodiversity – Landscape Level	FPPR secs. 9 and 12.4	Yes	This prescription is intended to mimic the natural disturbance pattern of mixed severity wildfire in the area through the retention of veteran trees and thinning of the understory.
Wildlife and Biodiversity – Stand Level	FPPR secs. 9.1 and 12.5(1)	Yes	This prescription provides for the stand level retention of wildlife trees; see prescription details below for wildlife tree targets. This will also be adhered to through the partial cutting retention; see stand and stock tables for detailed removal specifications.
Visual Quality	FRPA s 180 and FPPR 9.2	Yes	This unit is within a Retention Visual Polygon. A Visual Impact Assessment is required. The partial retention harvesting objective prescribed for this unit will limit the visual impact, and when combined with the high visual absorption capacity of this open forest landscape, it is anticipated that the recommended harvesting plan in this unit will comply with the visual quality objective.



VALUES – RESULTS & STRATEGIES			
Result/ Strategy/ Measure	Act/ Reg.	Applicable	How it Applies to the Site
Cultural Heritage	FPPR sec. 10	Yes	There are no known cultural heritage resources in the area. This unit will require a PFR or AOA as determined through the First Nations information sharing process.
Recreation Site, Recreation Trail or Interpretive Forest Site	FRPA sec. 181	Yes	This site is within REC polygon 6817 – Swakum Mountain Bike Trail Area. Approval from the Recreation Officer and subsequent Section 16 letter will be required prior to treatment. This prescription will not negatively impact these trails, and may help to improve safety to recreationalists in the area. This unit does not overlap the trail network, but uses the trail access road. Closure and signage of the road may be required.
Invasive Plants	FPPR sec. 17	Yes	There is a minor component of invasive plants in this unit. Invasive plants lower on Swakum Mountain Forest Service Road that may be tracked in through equipment. Burn pile and or slash burning treatments should consider the seasonality of invasive weeds, and strategic placements to reduce their proliferation.
Natural Range Barriers	FPPR sec. 18	No	There are no natural range barriers in this unit.
Watersheds	F-3-007 and F-3-008	No	This area is not within a fisheries sensitive watershed.
OTHER MANAGEMENT REQUIREMENTS			
Species at Risk Databases and Special Notes			
Migratory Bird Act Compliance- There were no noted bird nests or features on site. Large wildlife trees and stubs will be retained to provide nesting bird habitat.			
Trappers/ Guides/ Ranchers			
This polygon overlaps with Range Tenure 076730 A.			
Forest Health			
There are no noticeable forest health concerns. The large component of older Douglas fir may be vulnerable to Fd beetle; residual damage to leave stems through harvesting should be avoided.			
FIRST NATIONS			
There are no known cultural heritage resources in this area. This treatment will require information sharing with First Nations, and subsequent changes may be recommended through this process.			

RIPARIAN ASSESSMENTS					
Riparian ID	Riparian Class	Harvesting	SU	RRZ Width (m)	RMZ Width (m)
none					
Management Strategy	There are no riparian areas within this treatment area.				

ACCESS MANAGEMENT

SU	Max. Allowable Site Disturbance (%)	Max. Allowable Site Disturbance for Roadside Work Areas (%)	Maximum Permanent Access Structures %
1	5	25%	7%
Access Strategy:		This unit uses an existing road. A temp road may be required in the lower half to access adverse portion of the unit.	

SOIL ASSESSMENT

HAZARD RATINGS				SOIL CHARACTERISTICS			
ST	Soil Comp	Erosion	Soil Displacement	Depth to Unfavorable Substrate		Type of Unfavorable Substrate	Sediment Delivery Risk
				Max (cm)	Min (cm)		
SL	M	L	M	100	40	Coarse frag	low

FUEL MANAGEMENT-SITE DESCRIPTION

Topography	CFFDRS Fuel Type	Wind Direction	Fire Zone	PSTA Threat Rating	Proximity to Infrastructure
Rolling	C7	SE	K4	High	>2 km
Expected Wildfire Threat Reduction	<p>As per the 2017 PSTA dataset, the HFI for this area is 2000-4000 kw/hr. This is based on the FBP calculations for a C7 fuel type; this site has higher stems per hectare and conifer ingrowth than the baseline C7 fuel type, which most likely would result in elevated HFI.</p> <p>Due to the minimal existing surface fuel loading in these units, the surface fire intensity in these units will not be significantly reduced. The fire behavior will be reduced in this unit through the decrease in canopy bulk density. Canopy bulk density is related to stems per hectare (> SPH = > CBD), and has a direct impact on crown fire potential and stand damage. Canopy bulk density is a challenging metric to collect stand data for; however using assumptions from previous studies, in a Douglas fir leading stand a 50 % reduction in stems per hectare will result in a .10 to .20 kg/m³ reduction in canopy bulk density¹. This decrease in canopy bulk density will result in a reduction in crown fire potential.</p> <p>Using the 2012 Wildfire Hazard Threat Assessment Worksheet² (attached), the Wildfire Behavior Threat Score for this unit is "High". This prescription, through the reduction of understory stems and crown closure, should reduce the Wildfire Behavior Threat Score to "Moderate". A Wildfire Hazard Threat Assessment plot should be completed in this prescription unit post-treatment.</p>				
Anchor Points	This unit ties into a previous logging treatment. However this treatment is not applicable as an anchor point due to size.				

FUEL MANAGEMENT TREATMENT SPECIFICATIONS

Treatment Unit	SPECIFICATION
TU A	Crown Spacing: The increase in crown spacing is the primary objective of this treatment. Crown spacing should concentrate on an even distribution of leave trees with relatively uniform spacing

¹ Peterson, David L., et al. "Forest Structure and Fire Hazard in Dry Forests of the Western United States." 2005, doi:10.2737/pnw-gtr-628

² <https://www.ubcm.ca/assets/Funding~Programs/LGPS/SWPI/Resources/swpi-WUI-WTA-Guide-2012-Update.pdf>

Crown Spacing Measurable Objective

- 5 -7 meter crown spacing

Thinning: This treatment should retain a component of Fd and Py in all diameter classes to promote biodiversity and stand resilience. Thickets of understory trees should be removed if suppressed or growing immediately adjacent to leave trees. Regeneration if in good condition and growing in openings should be retained. Understory trees removed during harvesting should be placed in slash piles to limit contribution to fine fuel loading on site. Tree removal should concentrate on dead, dying and suppressed trees, or those growing under the drip line of leave trees

Thinning Target Trees:

- Trees in the dripline of larger diameter trees
- Suppressed, dead, dying or damaged trees

Thinning Measurable Objective:

- 90 % of target trees are to be removed

Debris Management: This site must be managed for residual slash loading and fine fuels. This objective can be managed through increased utilization and management of debris. A post- harvest slash burn may be used for this site to reduce debris which will require a burn plan.

Debris Management Measurable Objective:

- 5 to 10 T/ha fine fuel loading post treatment

Open Burning

Burning will be required on site to manage residual slash from harvesting. Burn piles should be placed so as to not damage leave trees, and to limit the proliferation of invasive weeds. Burning must be in compliance with the Open Burning Regulations.

Open Burning Measurable Objective:

- 80 % utilization of slash piles

STAND AND STOCK TABLE

Species and Diameter Class	Average Crown to Base Height (m)	Average Tree Height (m)	STEMS PER HECTARE (sph)			VOLUME PER HECTARE (m3/ha)		
			Existing	Cut	Leave	Existing	Cut	Leave
Layer 1 (> 40 cm dbh)								
Species Fd	0.9	28.5	33	0	33			
Total Live	1.3	28.2	23	0	23			
Total Dead			10	0	10			
Total All Species	1.3	25.9	33	0	33			
Total Conifers	1.3	25.9	33	0	33			
Layer 1 (> 27.6 cm dbh - 40 cm dbh)								
Species Fd	0.6	23.9	147	97	50			
Total Live	0.6	23.9	147	97	50			

Total All Species	0.6	23.9	147	97	50			
Total Conifers	0.6	23.9	147	97	50			
Layer 1 (> 22.6 cm dbh – 27.5 cm dbh)								
Species Fd	0.8	21.7	53	30	23			
Total Live	0.8	22.3	53	30	23			
Total All Species	0.8	21.7	53	30	23			
Total Conifers	0.8		53	30	23			
Layer 1 (> 17.5cm dbh - 22.5 cm dbh)								
Species Fd	0.3	17.2	117	67	50			
Total Live	0.4	17.8	110	60	50			
Total Dead	0.3	12.0	7	7	0			
Total All Species	0.4	15.3	117	67	50			
Total Conifers	0.4	15.3	117	67	50			
Layer 1 (≥ 12.5 cm - 17.5 cm dbh)								
Species Fd	0.5	11.6	133	83	50			
Total Live	0.4	10.7	96	46	50			
Total Dead	0.6	10.8	37	37	0			
Total All Species	0.4	10.1	133	83	50			
Total Conifers	0.4	10.1	133	83	50			
Total Layer 1								
Total Layer - All Species	0.6	16	483	277	206			
Total Layer - Conifers Only	0.6	28	483	277	206			
Layer 2 (≥ 7.5 - 12.5 dbh)								
Species Fd	0.6	8.2	190	160	30			
Species Py	0.9	5.5	20	0	20			
Total Live	0.7	7.3	113	83	30			
Total Dead	1.1	9.0	30	30	0			
Total All Species	0.7	6.9	190	160	50			
Total Conifers	0.7	6.9	190	160	50			
Layer 3 (≥ 1.3 cm - 7.5cm dbh)								
Species Fd	0.5	2.6	143	100	43			
Species Py	0.0	1.5	7	0	7			
Total Live	0.3	3.4	77	23	50			
Total Dead	1.0		73	73	0			
Total All Species	0.3	2.4	150	100	50			
Total Conifers	0.3	2.4	150	100	50			
Layer 4 (<1.3 cm dbh)								
Species Fd			280	180	100			
Total All Species			280	180	100			
Surface Fuel Loading (TPH)	Existing: Average of 6-8 T/ha total fuel loading, and 2-4 T/ha fine fuel loading.			Target: This unit has minimal existing ground fuel loading, excluding minor patches of downed fuel. Ground fuels may increase as a result of harvesting;				

		the post-harvest residual total fuel loading in this unit must be no more than 5-10 TPH of fine fuel loading.
	Method used to measure:	Visual estimation and Photo Guide For Quantifying Forest Stands in British Columbia Guides 501 and 502
Crown Closure (%)	Existing: Varies from 0 to 60 % over 40 plots. Average of 22 %.	Target: less than 15 %
BIODIVERSITY AND FOREST HEALTH CONSIDERATIONS AND TARGETS		
Coarse Woody Debris (CWD) Retention Target	5-20 pieces per hectare; concentration on larger pieces over 20 cm dbh.	
Wildlife Tree Retention Target	In excess of 1 per hectare where applicable.	

POST TREATMENT SPECIFICATIONS												
Expected Vegetation Response: This site is very dry. It is unlikely that there will be significant understory conifer regeneration or brush increase post treatment. Grass crop may increase significantly as a result of increased moisture availability.												
Maintenance Recommendations: Due to lower surface fuel continuity and suggested increased crown spacing and understory thicket removal, this site would be an excellent candidate for either a broadcast burn or prescribed burn at a later date. This site should be monitored for forest health and understory growth within 5 years to determine maintenance treatment. It is anticipated that mechanical maintenance will be minimal to moderate due to dry site conditions.												
Silviculture Obligations: The stocking standards as shown in the table below are based on the 2016 Fire Management Stocking Standards Guidance Document ³ . The IDK dk partial cut stocking standard was chosen as the most representative of the site (IDF xh 2) Based on the minimum stocking standards in the guidance document, this site prescription will meet the silviculture obligations for this site.												
STOCKING STANDARDS												
TU	Stocking Standard ID	Pref. Spp.	Acc. Spp.	Well-Spaced Stem/ha				Minimum Height (m)			Regen Delay	Free Growing (years)
				TSS	MSS		MITD	Fd	Py	RTH (%)		
					Pref. & Acc.	Pref.						
A	N/A	Fd Py Lw At	None	175	150	100		.8	.6	125	7	

³ https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/land-based-investment/forests-for-tomorrow/fire_management_stocking_standards_guidance_document_march_2016.pdf



PROFESSIONAL SIGNATORY	
FOREST PROFESSIONAL NAME (printed) Julie Maxwell, RPF	FOREST PROFESSIONAL SIGNATURE 
MEMBER NUMBER # 5126	DATE July 25 th , 2019
	
I certify that I have reviewed this document and I have determined that this work has been done to the standards expected of a member of the Association of British Columbia Forest Professionals.	

ATTACHMENTS		
On File	Attached	Item
	✓	Site Plan Map
	✓	Field Data Forms (digital)
	✓	Threat Plot Form
	✓	Site Photos
	✓	UWR Calculation Sheet

APPENDIX 1 – SITE PLAN MAP

