Fuel Management Prescription
Borland Valley (Primary Fuel Break Treatment Units, Primary TUs-A, B, C and D)

Forest Enhancement Society of British Columbia

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Location: This treatment area is located on Provincial Crown Lands within and adjacent to the Community of 150 Mile House along and south of Moffat Lake Forest Service Road (FSR). The southwestern section of this area is bounded by the Redeau Lake and Redeau Lake Road. The treatment unit in its entirety is intended to function as a primary fuel break, which entails the reduction of fire risk and modification of fire behaviour in and around the community or adjacent private lands. This primary fuel break is strategically located upwind of the Community of 150 Mile House and is designed to reduce the fire intensity by grounding overstory fires and reducing fire spread rates. The treatment units under prescription will serve as a demonstration area for fuel reduction and integrated resource management.

Mapsheets:
93A.011; 93A.001

Timber Mark: N/A

Comments: This project is consistent with the Land Manager's priorities for the Cariboo Region and has the support of the Regional Management Team (RMT), BC Wildfire Service (BCWS) and the Cariboo Operational Planning Team (COPT) which consists of representation from the Cariboo FLNRO regional and district staff and the BCWS. The project is also consistent with the Cariboo Landscape Fire Management Plan, the Williams Lake Interface Fire Plan (CWPP), the Cariboo-Chilcotin Land Use Plan (CCLUP) and the mule deer winter range General Wildlife Measures.
Land ownership: Crown Land.

Treatment Rationale:

The area under prescription is located in the dry belt interior Douglas-fir region and is comprised of primarily young to mature Douglas-fir stands. The stand age varies from approximately 80-120 years. Ingrowth and high stand density have created contiguous ladder and crown fuels. In some areas, pine beetle related mortality has resulted in heavy surface fuel accumulations. The fuel types encountered (primarily C3, with a minor component of C7) will support extreme fire behaviour under high and extreme fire danger. The proposed fuel treatment will reduce fire risk to adjacent residential properties, while demonstrating the principles of a landscape-level primary fuel break. This Fuel Management Prescription (FMP) provides the prescriptive guidelines as well as the recommended treatment activities to implement a proactive wildfire hazard reduction project. The treatment areas prescribed herein are located in the Borland Valley Area of Interest and have been strategically chosen with the intent of creating a Primary Fuel Break to protect the Community of 150 Mile House. This project was made possible through funding provided by the Forest Enhancement Society of British Columbia (FESBC) program and oversight by the BCWS and Cariboo FLNRO regional and district staff. The FESBC is a BC government organization that serves three primary objectives: 1) to enhance environmental and resource stewardship of forests in BC through investment in prevention and mitigation of wildfires, improvement of damaged forests and wildlife habitat, and encouraging efficient fibre use; 2) to advocate for environmental and resource stewardship within BC; and 3) to represent the public and societal interests.

The Borland Valley Primary Fuel Break prescription is intended to modify fire behaviour potential and provide suppression crews with an improved opportunity to protect values at risk such as residences and/or infrastructure in the event of an approaching wildfire from the south or west. The prescription calls for a reduction in surface fuel loading, ladder fuels and vertical and horizontal fuel continuity in order to create a primary fuel break. Fuel management within these treatment units will function as an anchor for back burning and to reduce aggressive fire behaviour to an extent that will limit crown fire behaviour and promote improved fire-retardant efficacies and ability of firefighting crews to apply direct attack at the fire front.

The proposed fuel reduction treatments also demonstrate various forest management options for management of mule deer winter habitat, as guided by the General Wildlife Measures (GWM) established under the Provincial Government Actions Regulation (GAR) of the Forest and Range Practices Act (FRPA). This prescription area is located within the Jones Creek (dwl 49) Mule Deer Winter Range. Forest management for Mule Deer Winter Range in the Cariboo-Chilcotin area is guided by stand-level objectives that specify levels of Fd basal

area retention in tree diameter classes >12.5 cm dbh and >37.5 cm dbh. In addition, management for ~~Ungulate~~ Mule Deer Winter Range in the Cariboo-Chilcotin requires the application of the residual basal area, diameter limit, and diminution quotient (BDq) approach for stand structure regulation to ensure long-term uneven-age stand structure goals are attained. This prescription utilizes the BDq method in order to set the residual stand stocking goals and employ clumpy/gappy retention throughout the proposed TUs. The thin-from-below approach (GWM 9) recommended in this prescription is designed to not only reduce fuel loads and fire behaviour, but also to concentrate future growth within the TUs on larger and more vigorous stems, providing cover and forage for mule deer."

Fuel Management Objectives

- Increase public safety both within and adjacent to the community;
- Enhance the ability of the 150 Mile Volunteer Fire Department and Wildfire Management Branch to protect both public and private property at risk;
- Creation of a landscape-scale primary fuel break;
- Improve natural barriers that reduce the continuity of fuel loads, fire behaviour and wildfire risk;
- Demonstrate the principles and practices of vegetation and fuels management to community members and the public;
- Reduce surface fire behaviour potential (to below 4500 Kw/M, or a Rank II) and the potential for crown fires and ember showers; and
- Minimize negative impacts to, and where possible enhance, the many values of the treatment area, including public safety, recreation opportunities, wildlife habitat, and biodiversity.

Fuel Management Strategies

- Maximize retention of dominant and co-dominant canopy trees to maintain a cool and moist understory microclimate;
- Thin from below (i.e. remove suppressed and many intermediate trees first) to reduce the risk of extreme crown fire behaviour associated with high crown bulk density and fire laddering through the crowns;
- Prune retained trees to a height of 3.5m in order to reduce ladder fuels;
- Reduce fine surface fuels and flammable understory vegetation to reduce the risk and behaviour of surface fire;
- Retain and encourage deciduous tree species and shrubs to reduce fire behaviour and provide wildlife habitat;
- Retain minimum targets of coarse woody debris to contribute to healthy forest ecosystems and biodiversity;
- Protect existing trail networks and ensure post-treatment trail conditions meet or exceed pre-treatment conditions;
- Engage in community consultation and communication, as appropriate, before and throughout the treatment implementation; and
- Improve safety for suppression crews in the area in the case of wildfire;

Treatment Longevity:

This prescription is expected to achieve the outlined fuel management objectives for approximately up to 15-20 years after implementation. After this period, it is expected that understorey regeneration may create ladder fuels that are likely to incrementally increase the TU's potential to support a crown fire. Natural overstorey mortality will lead to an increase in coarse woody debris and surface fuel accumulations over this time frame. Maintenance required at a future time would likely involve understorey thinning; brushing and removal of flammable vegetation; and surface fuel disposal.

FUELS ASSESSMENT			
TU	BEC Zone, Variant, S. Series	CFFDRS Fuel Type	Comments
A	IDF dk3 01	C3/C7	TU A is a mix of C3 and C7 fuel types, typical of second growth Fir dry belt stands. The TU boundary borders Redeau Lake to the southwest and is adjacent to Moffat Lake FSR. The stand is comprised of moderately dense Douglas-fir stems, intermixed with spruce and a smaller component of pine. This polygon rates as high (107 pts) for wildfire behaviour threat class, and moderate (14 pts) for WUI threat score.
B	IDF dk3 01	C3/C7	This TU is a mix of C3 and C7 fuel types, typical of second growth Fir dry belt stands. The stand is comprised primarily of moderately to highly dense Douglas-fir stems, with pockets of moderate coarse woody debris levels accrued during the previous Mountain Pine Beetle infestation. The northern portion of this TU borders Moffat Lake FSR. This polygon rates as high (107 pts) for wildfire behaviour threat class, and moderate (14 pts) for WUI threat score.

FUELS ASSESSMENT			
C	IDF dk3 01	C7	This TU is characterized primarily as C7 fuel type. The stand in this TU has been previously thinned and contains multiple pre-existing skid trails. Similar to TU A and B, TU C it is also delineated by Moffat Lake FSR in the northern portion. This polygon rates as high (109 pts) for wildfire behaviour threat class, and moderate (14 pts) for WUI threat score.
D	IDF dk3 01	C3	This TU is characterized primarily by C3 fuel type. This TU borders Moffat Lake FSR to the north and an open field to the southeast. In addition, a centrally located sandpit was noted in this TU. This polygon rates as high (125 pts) for wildfire behaviour threat class, and moderate (14 pts) for WUI threat score.

TREATMENT UNIT SUMMARY

TU	TU Name	Gross Treatment Area (ha)	Riparian Reserve Zone (ha)	Net Treatment Area (ha)	Treatment Type
A	Primary-A	17.8	0	17.8	HTR, TFB, SFR, P, PB/C
B	Primary-B	35.4	0	35.4	HTR, TFB, SFR, P, PB/C
C	Primary-C	7.5	0	7.5	HTR, CT, TFB, SFR, P, PB/C
D	Primary-D	44.2	0	44.2	HTR, TFB, SFR, P, PB/C
TOTAL NET AREA				**104.9**	

***HTR**= Hazard tree removal, **CT**=Commercial Thin, **TFB**=Thin from below, **SFR**= Surface Fuel Removal, **B**= Brush Flammable shrubs, **P**= Prune, **PB**= Pile Burn, **C**= Chip.*

Field Marking Convention: **Block boundary** – orange and black striped; **Block boundary corners** – double orange and black striped and single white ribbon with aluminum tag stating treatment area name, station number, and date; **Treatment-unit demarcation**—yellow ribbon, no writing; **Riparian Management Zone-** Blue Ribbon.

CURRENT STAND CONDITION

Statement of Limitations: *Stand descriptions and pre-harvest stand structure numbers are estimates only and should not be relied upon by contractors for estimating budgets used in bidding or tender preparation. Contractors are responsible for conducting site visits to gather sufficient information for tender preparation.*

Block: Primary TU A

LAYER	Definition	Species Composition by Basal Area (L1) by density (L2-L4)	Stems per hectare	Basal area (m^2/ha)	DBHq (cm)	Heightq (m)	Volume (m3/ha)	Crown Closure (% Cover)	Height to Live Crown (m)
L1 Merch	>17.5cm DBH	Fd95Sx5	563	43	36	28	358	42%	2.2 - 7.2 m*
L1 Submerch	12.5 - 17.5 cm DBH	Fd90Sx10	167	3			9		
L2	7.5 - 12.5 cm DBH	Fd95Sx5	617						
L3	<7.5 cm DBH, >1.3m height	Fd90Sx10	967						
L4	<1.3m height	Fd92Sx7	1150						
		TOTAL SPH	**3463**						

Block: Primary TU B

LAYER	Definition	Species Composition by Basal Area (L1) by density (L2-L4)	Stems per hectare	Basal area (m^2/ha)	DBHq (cm)	Heightq (m)	Volume (m3/ha)	Crown Closure (% Cover)	Height to Live Crown (m)
L1 Merch	>17.5cm DBH	Fd100	384	28	39	26	210	29%	2 – 5.7 m*
L1 Submerch	12.5 - 17.5 cm DBH	Fd95Sx5	200	4			12		
L2	7.5 - 12.5 cm DBH	Fd90Sx5Pl5	633						
L3	<7.5 cm DBH, >1.3m height	Fd89Sx9Pl2	1600						
L4	<1.3m height	Fd100	583						
		TOTAL SPH	**3401**						

Block: Primary TU C									
LAYER	**Definition**	**Species Composition by Basal Area (L1) by density (L2-L4)**	**Stems per hectare**	**Basal area (m^2/ha)**	**DBHq (cm)**	**Heightq (m)**	**Volume (m3/ha)**	**Crown Closure (% Cover)**	**Height to Live Crown (m)**
L1 Merch	>17.5cm DBH	Fd100	604	40	29	21	245	30%	2.2 - 6.2 m*
L1 Submerch	12.5 - 17.5 cm DBH	-	-						
L2	7.5 - 12.5 cm DBH	Pl100	150						
L3	<7.5 cm DBH, >1.3m height	Fd100	900						
L4	<1.3m height	Fd95Pl5	1400						
		TOTAL SPH	**3054**						
Block: Primary TU D									
LAYER	**Definition**	**Species Composition by Basal Area (L1) by density (L2-L4)**	**Stems per hectare**	**Basal area (m^2/ha)**	**DBHq (cm)**	**Heightq (m)**	**Volume (m3/ha)**	**Crown Closure (% Cover)**	**Height to Live Crown (m)**
L1 Merch	>17.5cm DBH	Fd95Pl5	354	13	23	17	62	40%	2.4 – 5.6 m *
L1 Submerch	12.5 - 17.5 cm DBH	Fd100	733	13			43		
L2	7.5 - 12.5 cm DBH	Fd80At15Pl5	1150						
L3	<7.5 cm DBH, >1.3m height	Fd93Pl6Sx1	1883						
L4	<1.3m height	Fd95Pl5	300						
		TOTAL SPH	**4420**						

* The high range in HTLC values for these TU areas reflect the patchy nature of the stands present throughout the units. TU C contains merchantable timber that was previously thinned, while the stand in TU D is characterized by primarily non-commercial timber with highly dense and hazardous fuels. The remaining TU area is primarily non-commercial timber and the stands contains more dense and hazardous fuels.

TREATMENT SPECIFICATIONS	
Activity	**Treatment Specifications**
Live Tree Thinning:	**Cutting Specifications:** TU A Overview: An even TFB method will be employed in this TU. Tree thinning: Total target tree density to 350 sph (+/- 50 sph). Thin the majority of stems up to **12.5 cm dbh** (leaving **<100 sph** of **12.5 cm dbh**) and thin from below > **12.5 cm to 45 cm dbh** to a total target density of **250 sph (+/- 50 sph)**. The total basal area target for **stems >12.5 cm dbh in this TU is 26 m^2/ha**. Target spruce and pine for removal, as well as damaged, poor formed trees, while retaining the thriftiest Douglas-fir trees. Maintain and promote an even distribution of residual Douglas-fir trees throughout the treatment unit. TU B Overview: An even, feathered* TFB method will be employed in this TU. Tree thinning: Total target density of **400 sph (+/- 50 sph)**, which requires an overall TFB treatment **to <27.5 cm dbh.** From this total target, thin the majority of stems up to **12.5 cm dbh (target density of <100 sph)** and TFB between > **12.5 cm** to a target density of **300 sph (+/- 50 sph)**. The total basal area target for **stems >12.5 cm dbh in this TU is 24 m^2/ha**. Target spruce and pine for removal, and retain Fd whenever possible. ***Feathered distribution: following the above thinning specifications, treatment activities will retain a feathered distribution of stems per hectare from north to south. The density of trees retained will transition from 300 sph in the north to 500 sph in the southern portion. The target average for the TU is 400 sph.*** TU C Overview: An even TFB method will be employed in this TU. Tree thinning: Total target density of **425 sph (+/- 50 sph)**, which requires an overall TFB treatment to **< 35 cm dbh**. The total basal area target for **stems >12.5 cm dbh in this TU is 23 m^2/ha**. Target Thin the majority of stems up to **12.5cm**

	dbh (leaving **<100 sph** of **<12.5 cm dbh**) and thin from below between > **12.5 cm** to a target density of **425 sph (+/- 50 sph)**. removal of spruce and pine, and favour retention of fir wherever possible. TU D Overview: A clumpy* TFB method will be employed utilizing existing gaps and clumps within this TU. Tree thinning: Total target density of **1000 sph (+/-50 sph),** which requires a TFB treatment to **< 22.5 cm dbh.** For stems < **12.5cm dbh** (target density of **300 sph**) and thin from below > **12.5 cm dbh** to a target density of **715 sph (+/- 50 sph)**. The total basal area target for **stems >12.5 cm dbh in this TU is 20 m^2/ha.** ***Clumpy distribution: Following the above thinning specifications, treatment activities will retain distributed clumps of diverse tree heights. Retained trees within each clump will have similar heights and will not represent a ladder fuel hazard to surrounding trees. Therefore, each clump will be surrounded by a gap defined as an area that is absent of coniferous vegetation. L1 interclump distance will be approximately 0.8 times of retained L1 average tree-heights for this TU and interclump distances for the L2 and L3/L4 clumps will be 10m minimum distance.*** **Across TUs A, B, C, & D:** **Maximum stump height** will be **15 cm** from ground for all live tree cutting (measured from the high side on sloped terrain). Additionally, cut angles will be less than **10 degrees**. Non-thrifty, unhealthy or dead trees will be specifically targeted for removal. Fd trees are preferred for retention over Sx and Pl and all deciduous trees of any dbh class will be retained. Thinning in the larger diameter classes will aim to break up canopy continuity and reduce overall crown closure to between 20-30%. See Appendix A & accompanying Appendix F for stand and stock tables with summaries of planned removals by size class and Appendix C for sample figures of Clumpy distribution. ****Reverse J-Curves and stand and stock tables were reviewed and quality checked for accuracy by Norman Caldicott, RPF, Silviculture Specialist.*
	Retention Specifications: Scarring and marking on retained trees will represent < 10% net treatment/ha. In all TUs, preference will be given to Fd over all other coniferous tree species. All trembling aspen, birch stems will be retained and considered "ghost trees" – (i.e., will not contribute to target densities). Rocky Mountain Juniper is important for First Nation's traditional use. Rocky Mountain Juniper, due to its high flammability, may be retained only if it is in a standalone position both vertically and horizontally. No more than 5 Rocky Mountain Juniper trees per hectare may be retained. Common Juniper represents a significant fire hazard and will be removed during treatment. Field crews must be properly trained to identify and distinguish both species. For cutting adjacent to recognized recreational trails refer to the **Recreation Section** of **RESOLUTION OF IDENTIFIED RESOURCE ISSUES** for further specifications.
Merchantable log removal	Current density targets are set to avoid excessive thinning of large diameter class size merchantable trees, as the treatment areas overlaps with the Mule Deer and Ungulate Winter Range, which guides the upper limit of dbh class removal of Fd stems. The objective of establishing a primary fuel break can be achieved by the current density targets. Merchantable log removal will be high for TU A, low for TUs B and C, and minimal in TU D. • TU A is approximately **138 m^3/ha** and consisted of all diameter class trees between 12.5 and 40 cm dbh, • TU B is approximately **35 m^3/ha** and consists of all diameter class trees between 12.5 and 27.5 cm dbh, • TU C is approximately **83 m^3/ha** and consists of all diameter class trees between 12.5 and 35 cm dbh, and • TU D is approximately **24 m^3/ha** and consists of all diameter class trees between 12.5 and 22.5 cm dbh.
Shrubs	Live deciduous shrubs should be retained. Dead shrubs and dead stems on living shrubs should be slashed where possible to promote suckering. Where possible, pile and burn common juniper on ground, when encountered. Crews should be trained to correctly identify this species.

Coarse Fuels (>7.5 cm diameter)

TUs are characterized by generally low amounts of coarse woody debris (CWD) and therefore it is not expected that very much CWD needs to be removed or retained (Table 1). However, some areas have higher concentrations than others. The operator will move CWD so that it is scattered at the density described in Table 1.

Table 1. Existing and target CWD in TUs.

Treatment Units	Existing		Maximum Target	
	CWD (pieces/ha)	CWD (kg/m^2)	CWD (pieces/ha)	CWD (kg/m^2)
A	17	0.2	100	1.0
B	67	0.6	100	1.0
C	0	0	100	1.0
D	33	0.3	100	1.0

Woody debris is an important ecosystem/habitat element. Retain a maximum of 100 pieces per hectare (approximately < 1.0 kg/m^2 or 10 tonnes/ha) with preference for pieces > 20 cm diameter at smallest point and > 5m in length. Existing decayed large diameter coarse woody debris (> Decay Class 3 or higher[1]) will be given preference for retention to enhance wildlife habitat and ecosystem values. CWD in decay class 4 or above is not counted towards CWD limits or target. A 'piece' within this prescription is defined as a 5m length, however as longer pieces are preferred, longer logs may be counted as multiple pieces. For example – a 10 m log will count as 2 pieces. Retained CWD will be bucked if necessary so that it lays flat to the ground along 70% or more of their length. Distribution of CWD will be scattered (not piled or continuous) and logs will not be touching.

No green (freshly cut wood) Douglas fir CWD may be left to meet CWD targets due to bark beetle concerns. Avoid scorching large existing CWD (>20 cm dbh) during burning operations. Machine operation will avoid compacting or disturbing large, old CWD.

Fine (0-2.5 cm) and Medium (2.5 – 7.5 cm) Fuel Loading

Existing fine woody debris (FWD) and medium woody debris (MWD) fuel loading was moderate with a combined average across all TUs of 2.0 kg/m^2, see Table 2 for amounts by each TU. Post-treatment surface fuels will not exceed the following loadings:

Post-treatment surface fuels (FWD and MWD combined fuel loading) will not exceed 0.5 kg/m^2 (5 tonnes/ha). Retention of FWD and MWD will be scattered and discontinuous.

Table 2. Existing and target FWD and MWD in TUs.

Treatment Units	Existing			Maximum Total Target (kg/m^2)
	MWD (kg/m^2)	FWD (kg/m^2)	Total FWD + MWD (kg/m^2)	
A	0.8	0.6	1.4	0.5
B	1.3	0.9	2.2	0.5
C	1.3	0.8	2.1	0.5
D	1.2	1.1	2.3	0.5

Fuel Hazard Abatement

According to the 2012 *'A Guide to Fuel Hazard Assessment and Abatement in British Columbia'* document, this prescription area is mapped as 'Severe' and due to the site's characteristics: (flat, minimal slope, Douglas-fir dominated) and with prescribed fuel dispersion; requires the development of an abatement plan in accordance with the legislation. According to legislation, a forest professional can develop an assessment strategy and an abatement plan that is tailored to the local site. This fuel management prescription in its entirety forms the fuel hazard abatement plan. This prescription requires the retention of no more than a total of 0.5 kg/m^2 (5 tonnes/ha) of fuel loading size class < 7.5 cm (FWD and MWD). FWD and MWD contribute the most to rapid fire spread and are thus reduced to these low limits. Finally, CWD will be scattered and lay flat to the ground so that CWD will decay more rapidly and contain a higher fuel moisture for most of the year. No hazardous fuel will be left post-treatment that is piled or accumulated or that could represent additional fire hazard.

Pruning

Retained conifers of all L1, L2, and L3 size classes will be pruned. Pruning will remove branches from all retained trees to a minimum of 3.5 m from the ground or to a height that maintains 40% of the total tree height as live crown, whichever is less. The 3.5 m minimum will be measured from the ground to the lowest reaching point of a branch (usually the branch

[1] https://www.for.gov.bc.ca/hts/risc/pubs/teecolo/fmdte/cwdcom.htm

	tip). It is expected that live crown ratio will be minimally impacted by this treatment prescription. Pruning cuts will aim to be flush with the tree stem without cutting into the branch collar, and branch stubs must be less than 1cm long. Dead branches >5 cm in diameter may be left unpruned at the discretion of the operator.
Debris Disposal – Pile Burning	Pile burning may be employed as a debris disposal method, following these procedures when piles are burned within the forested area of the treatment unit: • All burning is to be conducted in compliance with the BC Wildfire Act and Wildfire Regulation, and the Environmental Management Act Open Burning Smoke Control Regulations. Exceptions include practices explicitly managed under the smoke management plan, or where burning occurs under an Authorization to Discharge Waste under the Environmental Management Plan. • To minimize the effect of operations on public health, debris burning must be conducted in accordance with an approved smoke management plan developed in consultation with the MFLNRO Williams Lake Branch and approved by the CRD and the local Fire Chief. • Burn piles must be constructed to facilitate effective ignition and complete combustion with minimal tending by ground crews. Piles will feature a mix of small/large and live/dead stem and branch sections arranged to burn efficiently with minimal smoke production. No piles will contain bole sections > 3m in length. • Burn piles must not be located within an RMZ, 3 m of any trail, 3 m of animal burrows, 3 m of snags, and must not result in scorching of or heat damage to more than 5% of retained trees, pile burn locations will be chosen to avoid species that are sensitive to scorch such as Douglas-fir due to beetle infestation risk. • Burn piles must be within the treatment area boundary, in minimal number of piles, and adhere to a maximum size of 3m x 3m x 2 m tall (Category 2 piles). To reduce the number of piles, burning should occur concurrently with thinning operations using the hot-fed technique. However, up to 100 piles per hectare may be created if concurrent burning during thinning is not possible due to fire weather conditions. • The ventilation index will be indicated as 'good' (> 64) prior to igniting burn piles. Ventilation index is according to the forecast ventilation index prepared using Environment Canada data and approved by a director or forest official. Local ventilation must be confirmed by lighting a small test pile before lighting multiple piles. Burning can only continue if indices remain at fair or better. The Contract Supervisor may halt burning at their discretion if concerns related to public safety or health are identified. **It is the contractor's responsibility to monitor venting and adjust activities accordingly. Smoke will not negatively impact residences and the Community of 150 Mile House. Further requirements may be imposed, depending on public reaction and smoke conditions at the time of implementation.** • It is the contractor's responsibility to obtain all necessary burning permits from relevant agencies before burning (MoFLNRO, MoE, etc).
Debris Disposal – Chipping	In order to reduce smoke impacts on the valley and to follow regulations outlined in OBSCR, chipping may be employed where operationally feasible. Where chipping occurs, chips will be distributed evenly on–site, targeting an average of **5 cm depth** over the dispersal area and a maximum depth of 10 cm in any given spot, including trails. Chips may not be dispersed outside of block boundaries, onto trails or into RRZs and RMZs. Chips will not contribute to FWD loading kg/m^2.Chipped material that will result in depths greater than those outlined above must be hauled off-site to an appropriate disposal facility.
Debris Removal – Biomass Utilization	Under the FESBC funding guidelines, fibre utilization from damaged or low value forests is an important requisite for advancing environmental and resource stewardship of British Columbia's forests. Fibre resulting from harvesting activities will be utilized, whenever possible, prior to resorting to other debris disposal methods such as burning, chipping or composting. Arrangements may be made to have material removed and used by local companies that utilize wood fibre. The amount and type of material must be determined given the facilities' needs at the time of implementation. Contractors are encouraged to move debris off site for firewood, sale, power generation or other alternative uses. Pile burning of useable or merchantable material is discouraged.
Firewood	At the discretion of the Contract Supervisor, timber greater than 7 cm diameter that is suitable for firewood may be bucked (lengths not exceeding 1.5 m) and piled at locations of easy public access, to be designated by the Contract Supervisor, for community firewood collection. The contractor is responsible for ensuring that all firewood is either removed or burned by the end of their contract.

OPERATIONAL SPECIFICATIONS

Attentive Contract Supervision

Due to the increased complexity of this prescription – both in its overall geographic size and the multiple objectives of the treatment; it is highly recommended that a Contract supervisor(s) be made available during all phases of the operational treatment activities. The Contract supervisor(s) should be particularly attentive and provide oversight and on-the-ground explanation of the information and specifications provided in this prescription. Furthermore, it is recommended that the Contract Supervisor work closely with the Contractor at the very onset of the project and ensure that these specifications are being met to the fullest extent possible within the agreed upon budget.

Boundary and Riparian Management Zone Flagging

Block boundary – orange and black striped; Falling corners – double orange and black striped and single white ribbon with aluminum tag stating treatment area name; Station corners – double orange and black striped and single white ribbon – written information on white ribbon; Internal treatment-unit demarcation—yellow ribbon; RRZ - orange and black striped; and RMZ (machine free) – blue ribbon.

Public Consultation

Due to the potential delay between prescription preparation and implementation, affected residents must be consulted on the work plan prior to implementation. This consultation process should be undertaken by the MFLNRO Williams Lake Branch, or the designated Contract Supervisor, and may consist of contacting individual households or holding a general public meeting. Prescription specifications may be modified to accommodate resident interests, but must be formalized as a prescription amendment signed by a qualified RPF.

The area under proposed treatment will directly impact the use of recreational and mountain bike trails during treatment implementation. Consultation will take place with the MFLNRO Williams Lake Branch, specifically Desi Cheverie, Recreation Officer and applicable mountain bike trail user groups (150 Mile Greenbelt, Trails and Heritage Society) to solicit feedback regarding impacts and mitigation measures to protect the trails and trail use. One objective of the project is to demonstrate fuel management practices on a larger scale and as such, public consultation and information sharing is a priority of the project.

Public Notification

At least two weeks prior to implementation, signs describing the treatment must be posted at affected trail heads, and all residents or property owners directly adjacent to the treatment units must be notified of the treatment. Notification will include a contact name and phone number.

Riparian Management and Lakeshore Zones

A Riparian Management Zone of 30 m has been highlighted on the Diversion Canal which was classified as an S-4 stream. This area has sensitive soils and must not be entered by machines. No pile burning or chipping activities will take place within the area. All treatment activities within RMZ's comply with Forest Practices Planning and Regulation, see Table 3.

Table 3. Existing, removal and BA % retention of the proposed treatment units

Treatment Unit	BA/HA Existing	BA/HA Removal	BA % Retention
Primary TU-A	53	27	50
Primary TU-B	40	16	61
Primary TU-C	40	16	59
Primary TU-D	39	18	54

According to the CCLUP, Redeau Lake has a Lakeshore management zone of 190 m and is classified as a Lakeshore Management Class 'D' or 'modification' for visual quality objective in the LMZ. This 190m buffer partially overlaps a section of TU A. The CCLUP Part 1: Interpretation Schedule 2 (2011) documentation states a 'partial cutting' specification direction of:

- Max. disturbed area is 100% of the LMZ every 20 years, and
- BA retention in the LMZ is 50%.

A review of recent forest activities indicates very little recent historical cutting within the LMZ of Redeau Lake and the proposed area of treatment is significantly below 100%. Therefore, this prescription will not exceed the 100% disturbance within 20 years limit. In addition, this prescription proposes a >50% reduction in BA (Table 3) within this small overlap with Redeau Lake's LMZ which meets Schedule 2's 50% BA retention. Finally, Section 18 of the CCLUP Part 1: Interpretation (2011) states that variance is permitted in the LMZ, if:

- Reduction of fine surface debris, ladder fuels and small diameter trees in the intermediate and overtopped crown clases within interface fire management plan areas, where that does not diminish old growth characteristics.

The activities proposed in TU-A align well with the above bulleted fire management plan variance allowance for activities in LMZ's.

Soil Conservation
See table below (Soil Disturbance) for specific soil hazard assessment ratings. The treatment areas (TUs A, B, and C) are primarily located on flat ground, with the exception of their southern portions, which are characterized by steep slopes within the canyon leading to Borland Creek. TU D is primarily characterized as flat, though the northern portion bordering Borland Creek is slightly steeper.

Whenever practicable, machines will use existing trails. Bladed trails must be located in consultation with the Contract Supervisor and must avoid areas of seepage. Any soil displacement must be rehabilitated as soon as possible, including slope recontouring and surfacing with material that inhibits erosion and establishment of invasive species. All debris removal operations are restricted to conditions that will ensure soil disturbance requiring rehabilitation does not exceed 10% per hectare of net treatment area.

During burning, debris hauling, and equipment transport:

- Minimize soil disturbance and forest floor displacement,
- Vehicular access corridors must be approved by the Contract Supervisor and mapped and photo-documented prior to treatment,
- Should an unacceptable level of soil disturbance occur on trails or within the treatment area, the Contract Supervisor will develop an appropriate rehabilitation plan.
- Established trails will be maintained in or restored to pre-treatment condition, or as specified by the Contract Supervisor.
- Deactivation of temporary access will be completed immediately following treatment implementation, in order to inhibit any future vehicular/ATV access into treatment areas.
- Deactivation and rehabilitation is site specific and can involve any combination of the following approaches: 1. Removal and/or redistribution of woody materials as necessary to limit the concentration of subsurface moisture in the area; 2. Decompaction of compacted soils, where possible; 3. Returning displaced surface soils, retrievable side-cast and berm materials; and/or 4. Revegetation of exposed mineral soils.

Wildlife Tree Retention
The Land Use Objectives for the Cariboo-Chilcotin Land Use Plan Area: Part 2 – Objective, Sections 6 and 7 (2011) outlines requirements for wildlife tree retention (WTR). According to these Sections, all TUs A and B fall under Section 6 (as these prescriptions recommend BA % removal > 50% of pre-harvest stand basal area, see Table 3) Since TU's A and B fall under Section 6, the prescribing forester must address the addition of WTR areas.

This prescription is written with an important objective of reducing hazardous fuels and thus requires the prescribing forester to produce a continuous fuel treatment in order to greatly reduce the spread and behaviour of wildfire. For this reason, the prescribing forester does not recommend WTRs within any part of the fuel management prescription area.

This prescription is written such that the largest and healthiest trees (high and moderate value wildlife trees) as well as veteran trees are retained throughout the TU rather than in patches. A variety of tree species should be represented throughout the treatment areas for wildlife trees, including deciduous species. According to the *Biodiversity Guidebook* (1995), trees that have evidence of wildlife use (ie., cavities and nests) or heart rot, that are sizeable and well-branched, will be retained to ensure management for biodiversity objectives and long-term provision of valuable habitat for conservation and enhancement of wildlife.

The Contractor must conduct a Wildlife/Danger Tree Assessment (DTA) to identify and retain high value wildlife trees without unduly reducing the effectiveness of the fuel management treatment. Hazardous trees (as defined in the Workers' Compensation Board Occupational Health and Safety Regulation Part 26: Forestry Operations and Similar Activities[2]) must be assessed for risk, and if determined to pose a risk to workers, be removed or have a no work zone established of suitable size to protect workers. This assessment must be done by a qualified individual who has completed a training program acceptable to the WorkSafeBC Board. The responsibility of completing the DTA is the designated Prime Contractor's.

No large diameter trees (> 60 cm dbh) can be removed without the approval of the contract supervisor. In addition, high value wildlife trees must be prioritized for retention, where no work zones (NWZ) will not unduly reduce the effectiveness of the fuel management treatment. The shape and size of the NWZ will be determined based on the nature of the hazard and the lean of the tree, and aim to reduce the amount of area removed from the treatment.

Measures to prevent the spread of Invasive Plants
No invasive plants were noted during prescription development; however, Best Management Practices (BMPs) should be used to minimize the spread of invasive plants.
These include:

[2] http://www2.worksafebc.com/publications/ohsregulation/part26.asp

1. Clean equipment such as ATVs, trucks, or other vehicles when entering and exiting the treatment unit.
2. Avoid driving through or parking on weed infestations.
3. Seed or rake nearby native and uncontaminated forest floor materials over exposed mineral soil, including burned areas.

Breeding Birds
As per the BC Wildlife Act, Section 34, a person must not injure, molest or damage a bird or its egg, or a nest occupied by a bird or its egg. The nests of eagles, peregrine falcons, gyrfalcons, ospreys, herons and burrowing owls are specifically protected through the entire year under this regulation. In addition, the federal Migratory Birds Convention Act prohibits the killing of migratory birds directly or indirectly, or to disturb or destroy their eggs, nests or nest shelters during the breeding season.

To ensure compliance with these Acts, breeding bird/nest surveys must be conducted during the breeding season[3] (April 11 – Aug 23) by a qualified biologist prior to tree felling. See Outstanding Works Section below.

Powerlines
Distribution powerlines and communication lines run adjacent to the westernmost portion of TU A, situated just north of Redeau Lake. All work, including but not limited to felling, must be done in accordance with the utility providers safe work procedures. This may include using a certified utility arborist for falling trees adjacent to this infrastructure. It is the contractor's responsibility to ensure all safety and legal requirements are met including WorkSafeBC regulations that specify safe operating procedures.

Safety
Appropriate precautions must be taken by the contractor to ensure safety of workers and the public. Workers must follow WorkSafeBC guidelines, as well as any other applicable safety guidelines. There is public access along both Moffat Lake FSR and Redeau Lake Rd; therefore, access points must be controlled and appropriately signed. If necessary, trails and roads may be closed during operations, however, it is preferred that traffic control systems be used to allow safe public access through the area while operations are ongoing to limit impacts to immediate residents of the Borland Valley.

Fire Prevention and Suppression Capabilities
In addition to any requirements imposed by the BC Wildfire Act and Wildfire Regulation and District Burning Bylaws:

- Crews will have two functional cell phones on site at all times (where cellular service is available) and follow a written fire emergency reporting procedure.
- If burning occurs when snow is not present, crews will consult with the local Fire Department and maintain hydrant access capability (subject to availability), where burn-piles are located within 300 m of structural values at risk. Where hydrants are not available other measures must be implemented in compliance with regional fire bylaws and to the satisfaction of the Fire Chief and to a level that satisfies Wildfire Regulations under the Wildfire Act.

Stocking Standards
A combination of single tree selection and retention silviculture systems will be managed for an initial entry followed by potential harvest entries between 30 and 50 years. In essence, the stand will be managed for one rotation entry and residual stems. Post-treatment retention level targets are specified in the prescription and range between 300-1,200 sph. Reforestation is not prescribed. See Rationale below.

Uneven aged dry belt fir stocking standards taken out of the Williams Lake FSP (2012) as well as proposed Fire Management Stocking Standards documented in the Fire Management Stocking Standards Guidance Document (2016) are included for reference (Table 4):

[3] http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1#_03

Table 4. Stocking standards (top, Williams Lake FSP; bottom, Proposed Fire Management Stocking standards) for IDF dk3 01 site series within TUs.

Zone/SZ	Series	Species		Stocking			Min Intertree distance (m)	Regen Delay (max years)
		Preferred (p)	Acceptable (a)	Target	Min p&a	Min p		
Uneven aged dry belt fir:	01	Fdi, Pli	Sx	1200	700	600	2	-
	01	Fdi, Pli	Sx	1000	500	400	2	-
	01	Fdi, Pli	Sx	800	400	300	2	-
IDFdk3	01	Fdi, Pli	Sx	600	300	250	0	7
Proposed Fire Management Stocking Standards								
IDFdk3	01	Lw/1.0 Py/0.6 Fd/0.8 At	-	175	150	100	2	7

All TU's are field classified and determined to be dominated by IDF dk3 01 site series; therefore, stocking standards for this site series will be used for comparison. In addition to this site series, there are isolated pockets of IDF dk3 07 which are located in the Lakeshore management area in the southern portion of TU A, and in the southeastern portion of TU B, in a narrow band along the S4 water diversion infrastructure.

When comparing this prescription's specifications to the Williams Lake FSP, the uneven aged dry belt fir stocking standards will be met for all of the TUs as the range of minimum preferred species (Fdi, Pli) is between 250 and 600 sph while this prescription outlines a post-treatment stand condition between 300 and 1,200 sph (see Table 4). In addition, all TUs will meet the reduced Fire Management Stocking Standards for IDF dk3 (Table 4).

Rationale for Reforestation Exemption

- This prescription will meet the requirements of Mule Deer Winter Range GWM 01 by meeting GWM 01 Section (b) post-treatment.
- No new openings greater than 0.1 ha will be created under the recommended treatment activities and specifications within this prescription,
- The proposed fuel treatment will utilize a variable even-aged management approach that includes both a single tree selection silviculture system and or a retention system (similar to variable retention). The retention systems applied will be designed to retain individual trees or groups of trees to maintain structural diversity over the area of the cutblock for at least one rotation.

From a fire perspective, the application of a retention system will be used to reduce hazardous coniferous understory development/ingress, decrease ladder fuels, increase understory shrub and herb production, and decrease crown bulk density (aerial fuel continuity). The fuel break will maintain a lower fuel moisture content and will decrease the occurrence of high wind speeds within the stand. With an objective of reduced fire behavior potential, the intent of specific fuel treatment prescriptions will be an entry to remove a portion of merchantable, non-merchantable, downed stems and fine fuels. Regeneration and timber production at the stand level are considered secondary objectives within the context of fire hazard reduction.

LAND STATUS, FOREST PLANNING, MAPPING AND REFERRALS	
Appropriate investigations have been conducted to ensure that the area included in the prescription is crown land or land under the direct control or ownership of provincial, federal, or municipal government. The area proposed does not overlap or conflict with private land, an Indian reserve, a park or protected area, and is not encumbered by other tenures or jurisdictional issues. TU D does have a slight overlap with a legal Old Growth Management Area.	Yes ☒ No ☐
This application is consistent with a Community Wildfire Protection Plan for the area. If there is no CWPP for the area, MoFLNRO Wildfire Management Branch staff must have signed off on the proposed treatment:	Yes ☒ No ☐ NA ☐
Map(s) are attached and comply with the standard required.	Yes ☒ No ☐
The prescription 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. **A Referral package has been sent to BCTS (Sept 5, 2017).**	Yes ☒ NA ☐
The major licensee(s) have been provided with an accurate location and assessment of potential impact on silviculture from use of trails and landings in plantations.	Yes ☐ NA ☒

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 ☒ NA ☐
RESOURCE VALUES: *The area has been checked for the following values and appropriate management is described if an issue is noted.*	
Other leases, licences or permits: **The proposed treatment area overlaps Range, Trapline, Guide Outfitters licenses and permits.**	Yes ☒ No ☐ NA ☐
Ungulate winter range (UWR): **All TUs are entirely overlapping the Jones Creek (dwl 49) 'high' stand structure habitat class Mule Deer Winter Range.**	Yes ☒ No ☐ NA ☐
Wildlife habitat areas:	Yes ☐ No ☒ NA ☐
Lakeshore management zone (consistent with any lakeshore management zone objectives): **Redeau Lake located to the southwest of the Area of Interest has a Lakeshore management zone of 190m and overlaps part of TU A.**	Yes ☒ No ☐ NA ☐
Visual Quality (check 'No' if the treatment area is not consistent with visual quality requirements): **No VQO requirements.**	Yes ☐ No ☒ NA ☐
Community watershed:	Yes ☐ No ☐ NA ☒
Domestic water licence intakes or water delivery infrastructures that might be affected: **TU A and B overlap with two water delivery infrastructures, pertaining to two Points of Diversion (Westernmost point - License number: C063252, POD: PD40038; Easternmost point – Licence number: C048720, POD: PD40049). Referral packages have been sent to appropriate POD licence owners (May 1, 2017). Response received from Ducks Unlimited requests that any activities carried out do not impact either the headgate or the ditch associated with the POD, which can be assured by taking the following precautions:** **1. Minimize disturbance of the ditch edge, side-slopes and bottom, and any riparian vegetation such as grasses, shrubs or young trees, so that the ditch remains stable.** **2. Should any portion of the ditch require filling (e.g. to cross it with equipment or trucks), ensure the ditch is returned to the condition it was in before the forestry activities were started, so that the ditch will continue to allow water to flow unobstructed.** **3. Ensure the trail present along the ditch in some places is left clear following forestry activities, so machinery can continue to access the ditch in the future.** **4. Minimize disturbance of any infrastructure that exists at the diversion point or along the ditch, such as culverts or low weirs made out of corrugated steel, wood, concrete or other materials.** The aforementioned recommendations will be incorporated into the planning and implementation of the proposed treatment.	Yes ☒ No ☐ NA ☐
Species at Risk: **Multiple SAR and at-risk ecological communities.**	Yes ☒ No ☐ NA ☐
Old Growth Management Areas: **TU D overlaps with a Permanent Legal Old Growth Management Area (ID: CAR_RCA_5203, Feature Code: AS19625200)**	Yes ☒ No ☐ NA ☐
Forest Ecosystem Networks:	Yes ☐ No ☒ NA ☐
Guide Outfitters License: Treatment area overlaps with a guide outfitter license (certificate number: 500908). **Referral package has been sent to the appropriate guide outfitter certificate holder (May 1, 2017) and no issues were identified.**	Yes ☒ No ☐ NA ☐
Range tenures: fences, natural range barriers – (referral package was sent on May 1, 2017): **Treatment area overlaps two range tenures (RAN076829 and RAN076628). Fences are present in TU A and B. Referral packages have been sent to the appropriate range tenure holders (May 1, 2017) and no issues were identified.**	Yes ☒ No ☐ NA ☐
Recreation resources, features, recreation site, forest interpretive site or recreation trail: **TU A, B and D overlap several non-sanctioned recreational and mountain bike trails. A referral package has been sent to 150 Mile Greenbelt and Trails Society (May 1, 2017). Response received from 150 Mile Greenbelt and Trails Society requests the following:** **1. Main concern is the integrity of the trail network post treatment.** **2. Most trails are multi use trails and treatment adjacent to the trails must ensure that braiding of the trails does not occur due to increased sight lines around corners on the various trails.** **3. Retain all/most green trees adjacent to trails and place large woody debris perpendicular to the trails (very important on the inside of trail corners).** **4. Skid trails from the 2300 -Road (Moffat FSR) must be deactivated to ensure the skid trails do not become shortcuts to access the trail network.** **5. Old non-status roads that are legal trails must not be used as skid trails or roads (must be maintained in original condition).** The aforementioned recommendations will be incorporated into the planning and implementation of the proposed treatment.	Yes ☒ No ☐ NA ☐
Archaeological Resources: **No direct overlap of archeological resources.**	Yes ☐ No ☒ NA ☐
Cultural Heritage Resources (Referral required to appropriate First Nations): **T'exelc First Nation or Williams Lake Indian Band – a referral package was sent out September 5, 2017.**	Yes ☒ No ☐ NA ☐
Wildlife habitat features: [Must comply with FPPR s. 70(2) unless exempted under section 92(2)]	Yes ☐ No ☐ NA ☒
Resource features: [Must comply with FPPR s. 70(1) unless exempted under section 91(1)]:	Yes ☐ No ☐ NA ☒
Other: Trapline license, Guide outfitters license, invasive alien plants	Yes ☒ No ☐ NA ☐
Written comments from public referral: See section **OPERATIONAL SPECIFICATIONS**	Yes ☐ No ☐ TBD ☒
RESOLUTION OF IDENTIFIED RESOURCE ISSUES.	
Recreational Trails, Temporary Access	Sanctioned and non-sanctioned recreational trails are present throughout the treatment areas (See Map). Existing sanctioned and non-sanctioned recreational trails can only be used as temporary access trails if the width of the trail

Trails, landings and Roadside Screening	can accommodate the proposed machinery. All sanctioned and non-sanctioned trails and trail intersections will be built and utilized following approval from the FLNRO representative and will be rehabilitated following use (see Soil Disturbance Section). All trails will be rehabilitated to their pre-treatment condition if used during the fuel treatment operations. Per the MDWR GWM 01, where new temporary trails and landings are proposed and constructed; these will not be located within 30 m of ridges or topographic breaks. Per the MDWR GWM 03, where new temporary trails are proposed and constructed; these will not be located within 30 m of ridges or topographic breaks (See Hillshade Maps, Appendix E). Per the MDWR GWM 02, where landings are proposed and constructed; these will not be located along major topographic features, including within 100 m of minor ridges or minor topographic breaks identified in the field (See Hillshade Maps, Appendix E). Temporary access trails will not exceed 10% of the net harvested area. Within TU's A, B and D and where practicable, the operator will retain clumps of trees as close to sanctioned trails as possible in order to create recreational trail screening. Clumps size and distribution will follow specifications outlined at the beginning of this document. Screening along Moffat FSR will be required in order to protect wildlife from hunters as well as dust abatement. Screening will be retained in strips of maximum of 3 trees in depth and 50 meters in length. Distance between screens will be minimum 30 m. Screens will be strategically located along roadways where there are no existing visual barriers.
Utility Infrastructure	Distribution powerlines and communication lines run adjacent to Redeau Lake Road and Moffat Lake FSR in the northwestern portion of TU A along the treatment unit boundaries. All work including but not limited to felling, must be done in accordance with the utility providers safe work procedures. This may include using a certified utility arborist for felling trees adjacent to this infrastructure. It is the contractor's responsibility to ensure all safety and legal requirements are met.
UWR	UWR u-5-002 dwl 49 (Jones Creek) for Mule Deer overlaps TU's A, B, C and D entirely. After consultation with Becky Bings (FLNRORD Senior Habitat Biologist) GAR Order exemptions will be required for these TUs: • TU-A, • TU-C, and • TU-D. Formal GAR Order exemptions for the above TU's must be obtained before treatment commences.
Known Species at Risk (Local knowledge and CDC)	The Conservation Data Centre reports a generalized Blue-listed **Bobolink** occurence adjacent to and overlapping TU D. Habitat for this species is primarily grasslands, so no impact from treatment is anticipated. The **Western Painted Turtle** (Blue listed) has been reported by local biologists and residents of the Borland area. These sightings most often occur near creeks and lakes near the proposed treatment area; although not exclusively. A known colony of **Great Blue Heron (Blue listed)** may or may not be occupying a site in the vicinity of the proposed treatment area. See Appendix D for further information on Best Management Practices for the species listed above.
Potential Species at Risk (BC Species and Ecosytem Explorer)	The prescribing foresters used the BC Species and Ecosystem Explorer (January, 2018) and the following criteria to determine the below list: Restricted to Red, Blue and Legally designated species, Central Cariboo Forest District, Habitat Subtypes: Bog, Conifer Forest – Dry, Riparian Forest, Riparian Shrub, Roadside/Ditch and BGC Zone: IDF. Based on these criteria, the following at risk species may be present within the proposed fuel treatment: • Western Toad (Yellow listed), • Olive-sided Flycatcher (Blue listed), • Black Swift (Blue listed), • Spotted Bat (Blue listed), • Wolverine (Blue listed), • Lewis's Woodpecker (Blue listed), • Flammulated Owl (Blue listed), • Grizzly Bear (Blue listed), • Little Brown Myotis (Blue listed), • Northern Myotis (Blue listed), and • Fisher (Blue listed). See Appendix D for further information on Best Management Practices for all species listed above.

Potential at-Risk Ecocommunities (BC Species and Ecosystem Explorer)	The prescribing foresters used the BC Species and Ecosystem Explorer (January, 2018) and the following criteria: Red or Blue listed, Central Cariboo Forest District, MOE Region 5 (Cariboo), BGC zone/subzone/variant: IDFdk3, IDFxm and ecosections: CAB (Cariboo Basin) in order to search for at-risk ecological communities. Based on the listed criteria, the following ecocommunities may be present within the proposed fuel treatment: • Alkali Saltgrass Herbaceous vegetation (IDFdk3/Gs01, IDFdk3/Gs01) and Alkali Saltgrass – Nuttall's alkaligrass (IDFdk3, IDFxm), and • Douglas-fir -Common Juniper-clad lichens (IDFxm3). See Appendix D for further information on Best Management Practices for all species listed above.
Old Growth Management Areas	TU D overlaps a Permanent Legal Old Growth Management Area (CAR_RCA_5203). Although harvesting is generally not allowed to take place within permanent-static Old Growth Management Areas (OGMAs), according to the CCLUP and more recent Legal Land Use Order Regulation, exceptions can be made for the following situations: 1. OGMAs located in Mule Deer Winter Range in shallow and moderate snowpack zones can be thinned-from-below to enhance old forest attributes; and 2. Removal of surface and ladder fuels, as well as small diameter trees within areas of interface fire management zones, is permitted so long as old growth characteristics are preserved. TU D is located within the shallow and moderate snowpack zone for Mule Deer Winter Range, and therefore qualifies for the aforementioned exceptions.
Point of Diversion License	TU A and B overlap water delivery infrastructures associated with two Points of Diversion (Licence No. C063252, and Licence No. C048720). These water delivery infrastructures will not be directly affected by the proposed treatments within this FMP. While no in-stream works are proposed, treatment implementation must follow the Water Act Regulations. This means ensuring no materials adversely impact the stream, maintaining water quality standards, and ensuring no disturbance or removal of stable natural materials and vegetation. Treatment must be done so that water users are not adversely affected.
Archaeological Resources	According to Provincial records there are no known archaeological sites recorded within the proposed treatment areas. Local knowledge of the affected First Nations indicates the possibility for archeological resources to exist in all TUs. Prior to implementation, an Eligible Consulting Archaeologist will be contacted to review the proposed activities and, where warranted, conduct a walk over and/or detailed study of the area to determine whether the work may impact archaeological materials. If the archaeologist determines that development activities will not impact any archaeological deposits, then a permit is not required. Any results of this assessment will be incorporated into the prescription prior to any implementation activities taking place. There is always a limited possibility for unknown archaeological sites to exist within the area of interest. Archaeological sites (both recorded and unrecorded) are protected under the Heritage Conservation Act and must not be altered or damaged without a permit from the Archaeology Branch. If any land-altering development is planned for the area, owners and operators will be notified if an archaeological site is encountered during development, activities must be halted and the Archaeology Branch contacted at 250-953-3334 for direction.
Traplines	Trapline Area Identifier is: TR0211T006. It is not expected that fuel treatment activities will have any negative impacts on trapping opportunities.
Guide Outfitters License	Guiding Certificate Number is: 500908. It is not expected that fuel treatment activities will have any negative impacts on guiding opportunities.
Invasive Alien Plants	Invasive plants exist along 1) Moffat Lake FSR, north of TU A, B and D; and 2) in TU D. Reported occurrences in the vicinity of the proposed TU A, B and D, and within TU D include Spotted knapweed (SK), Knapweed species (KS), and Diffuse knapweed (DK). Occurrences of the above listed plants as well as potential other invasive plants along roadways, power line right of way, and trails should be expected. Operations should minimize the spread of invasive plants: 1. Minimize trips through identified invasive plant sites. If known invasive plant sites are traversed by foot crew or machinery, clean clothing, boots, and equipment thoroughly before transitioning within and between treatment units. 2. Avoid driving through or parking on weed infestations. 3. Areas of mineral soil exposed as part of undertaking this treatment that are within 50m of known invasive plant infestations should be re-seeded with a Canadian registered commercial seed mixture suitable to the area.
OTHER CONSIDERATIONS AND REQUIREMENTS	
CONSULTATION – FIRST NATIONS	
First Nation	**Concerns Identified and Measures to Address**

T'exelc (Williams Lake Indian Band)	Referral letter to the T'exelc First Nation was sent on September 5, 2017. Preliminary response received on September 6, 2017, from the T'exelc First Nation requests the following: Provision of work for the Williams Lake Indian Band Community (ie., environmental, operational, or archaeological). See Outstanding Works Section.		
First Nations Consultation complete	Yes	**No**	The concerns above will be addressed prior to commencement of proposed operations and will be lead by a District FLNRORD representative.

RIPARIAN MANAGEMENT & BIODIVERSITY	
Streams, wetlands and lakes are correctly classified and indicated on the map.	Yes ☒ No ☐ NA ☐
Appropriate timing for removal of skid trail crossings of streams and non-classified drainages is identified.	Yes ☐ No ☐ NA ☒
Treatment in RMA is consistent with Forest Planning and Practices Regulation (s. 52(1) may not apply)	Yes ☐ No ☐ NA ☒
Treatment is planned in the RMZ identified on the map **(machine-free zone, no chipping and no burning zone)**	Yes ☒ No ☐ NA ☐
RRZ's have been marked in the field to prevent treatment (if No, complete the next row of this table)	Yes ☐ No ☐ NA ☒
Treatment is planned in an RRZ identified on the map	Yes ☐ No ☒ NA ☐
Wildlife tree retention is consistent with the FPPR: **See Wildlife Tree Retention Section above.**	Yes ☒ No ☐ NA ☐

RIPARIAN ASSESSMENTS

Units	Riparian I.D.	Class	RRZ	RMZ	Comments (Indicate if in a community watershed)
TU A & B	No name (Diversion Canal)	S4	0	30	TU A and B have an unnamed riparian feature, which acts as a diversion canal that transports water from Redeau Lake and was classified as an S4. The FPPR requires a 30 m RMZ for S4 streams.

SOIL DISTURBANCE

TU	Hazard Ratings			Maximum Allowable Soil Disturbance (%)	Sensitive Soils (Y/N)	Texture	Coarse Fragments (%)
	Soil Compaction	Soil Displacement	Soil Erosion				
A	H	M	H	10	N	Si/SiL	20
B	H	M	H	10	N	Si/SiL	20
C	H	M	H	10	N	Si/SiL	20
D	H	M	H	10	N	Si/SiL	20

Soil Conservation Comments: See Operational Specifications—Soil Conservation

WINDTHROW

Treatment Unit	Hazard Rating	Comment
A	Moderate	All units: Overall rating is moderate. Soil and biophysical hazard are rated as moderate, stand hazard is rated as high, and topographic and treatment risk are rated as moderate.
B	Moderate	
C	Moderate	
D	Moderate	

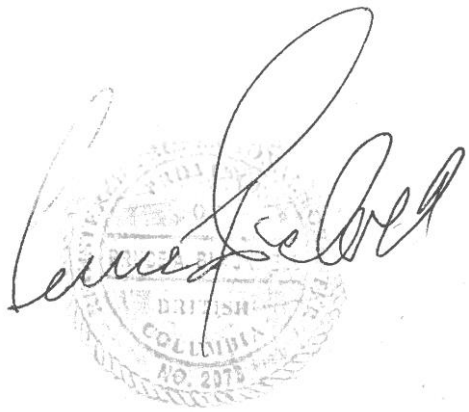
SEASONAL CONSTRAINTS AND SLOPE STABILITY	
All season treatment is appropriate (low potential for Archaeological Resources and suitable soil conditions)	Yes ☒ No ☐
The treatment is to occur only when soil is dry or frozen, or when adequate snow pack exists to ensure minimal soil disturbance to sensitive soils.	Yes ☒ No ☐
The prescribed treatment area has been reviewed by the Archaeology Branch of the Ministry of Forests, Lands and Natural Resource Operations, and does not overlap with areas of archaeological potential.	Yes ☒ No ☐
The prescribed treatment area has been field assessed by an archaeologist and no further archaeological work is prescribed.	Yes ☐ No ☒ N/A ☐
The treatment is unlikely to affect subsurface archaeological resources. Measures are prescribed to prevent damage to aboveground archaeological resources such as rock paintings and culturally modified trees.	Yes ☐ No ☐ N/A ☒
Primary forest activities under this fuel management proposal will not materially reduce slope stability on the area or on adjacent areas.	Yes ☒ No ☐
BOUNDARY, ROAD, LANDING, AND TRAIL	
Treatment boundaries are clearly marked on site and accurately mapped.	Yes ☒ No ☐
The condition of existing trails will be assessed and documented prior to treatment.	Yes ☒ No ☐
Existing roads and landings are in a condition suitable for use without modification.	Yes ☒ No ☐

Access trails will be marked in the field prior to treatment after consultation with the contractor.	Yes ☒ No ☐
Temporary access trails will be rehabilitated.	Yes ☒ No ☐

FOREST HEALTH FACTORS			
AGENT NAME	**SPECIES AFFECTED**	**INCIDENCE**	**MORTALITY**
Mountain Pine Beetle	Pl	Moderate	High
Douglas Fir Beetle	Fd	Nil-Low	Moderate
IBM damage noted was seen in the form of grey attack and had moderate spread throughout all TUs, though TU A and B had higher occurrences of mountain pine beetle damage. IBD damage was generally nil-low and diffuse in nature. IBD damage was reflected via red attack.			

OUTSTANDING WORKS

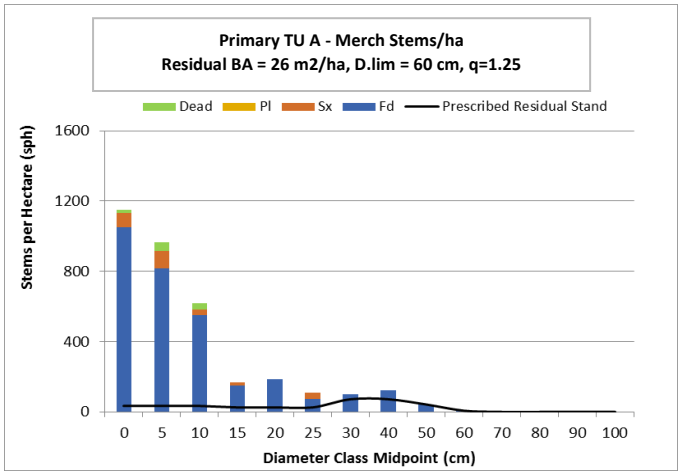
1) A response was received from the Williams Lake Indian Band Community regarding a provision for work at later phases of this prescription, including environmental, operational, and/or archaeological. A FLNRORD representative will be resolving this request.
2) UWR GAR Order exemptions must be obtained for TU's A, C and D prior to commencement of operations.
3) The appropriate cutting authority must be obtained prior to commencement of operations.
4) Prior to commencement of operations, the Contractor and Contract Supervisor and a FLNRORD representative will collectively decide the locations for temporary access trails. These temporary access trails will be mapped and flagged before treatment commences. During this phase of work, the group will also decide on appropriate trailside screening.
5) In consultation with the Contract Supervisor and the FLNRORD representative, an RPBio will be employed to conduct a breeding bird survey if treatment activities occur during the breeding bird season (April 11 – Aug 23). The Contract Supervisor, FLNRORD representative and the RPBio will list the target bird species for nesting bird surveys and will collaborate together on no work zones when bird nests are found.
6) A public open house describing the FMP and implementation workplan should be hosted by the Contract Supervisor. In addition, at least two weeks prior to implementation, signs describing the treatment must be posted at affected trail heads, and all residents or property owners directly adjacent to the treatment units must be notified of the treatment. Notification will include a contact name and phone number.
7) Decision on whether or not to include a 1 ha 'control' area ribboned within one of the TU's.

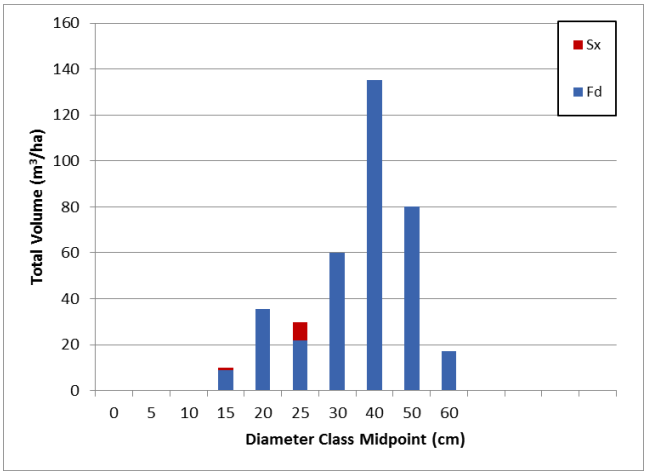
RPF PRINTED NAME		**Registered Professional Foresters Signature and Seal**
Bruce A. Blackwell	**2073**	
DATE SIGNED		
January 31, 2018		
I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work.		

A. Stand and Stock Tables

TU A

Pre-treatment stand condition (species composition by density and by volume):



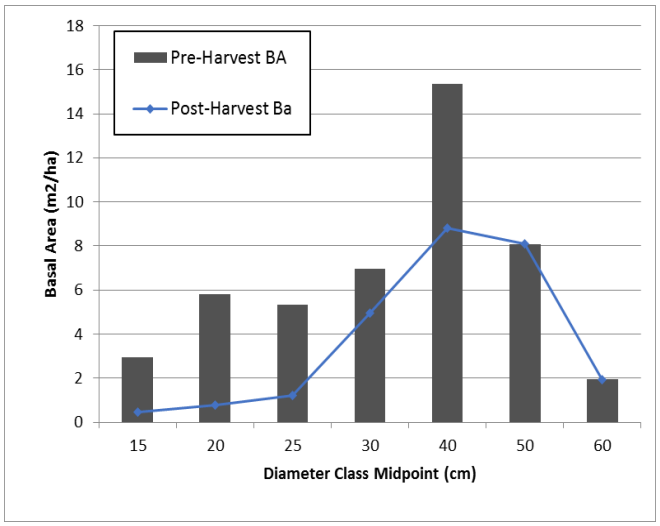


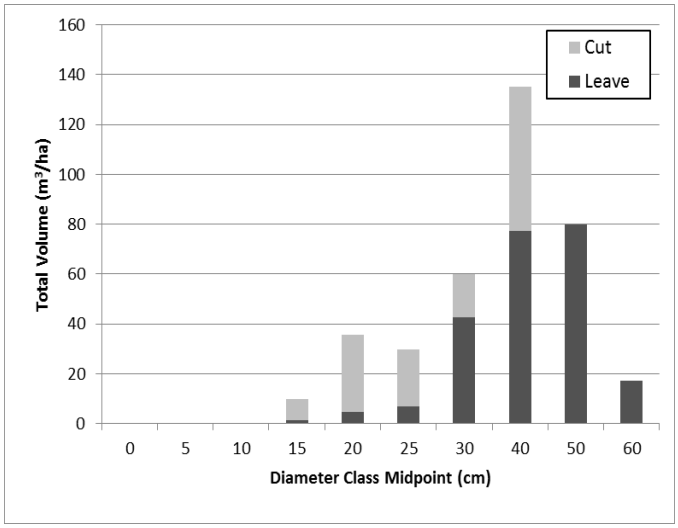
Removal specifications by stems per hectare in each size class to achieve 350 sph (+/-50 sph) target density:

Stand Table

Stand Layer	DBH Class Midpoint	Species						Cutting Specs	Cut	Leave
		Fd	*Sx*	*Dead*	*Pl*	*At*	*Ep*			
L4	0	1050	83	17				97%	1117	33
L3	5	817	100	50				97%	934	33
L2	10	550	33	33				95%	584	33
L1s	15	150	17					85%	142	25
L1	20	185	0	0	0	0		87%	160	25
	25	73	36	0	0	0		77%	84	25
	30	98	0	0	0	0		29%	29	70
	40	122	0	0	0	0		43%	53	70
	50	41	0	0	0	0		0%	0	41
	60	7	0	0	0	0		0%	0	7
	70	0	0	0	0	0		0%	0	0
	80	0	0	0	0	0		0%	0	0
	90	0	0	0	0	0		0%	0	0
	100	0	0	0	0	0		0%	0	0
								Totals	**3101**	**362**

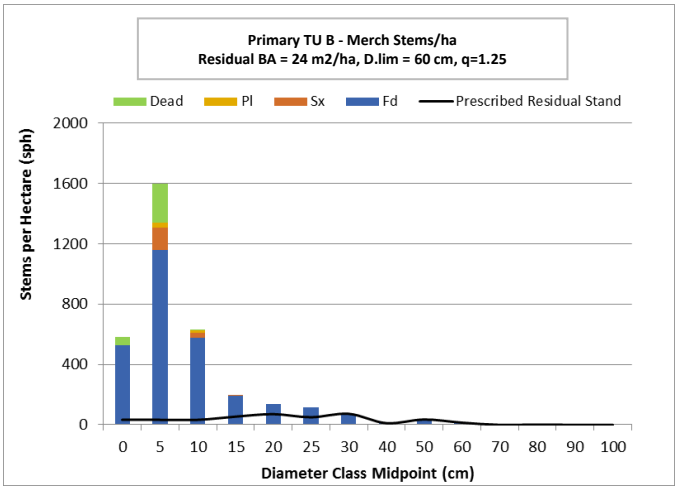
Removals by basal area >12.5 cm dbh, and by volume:

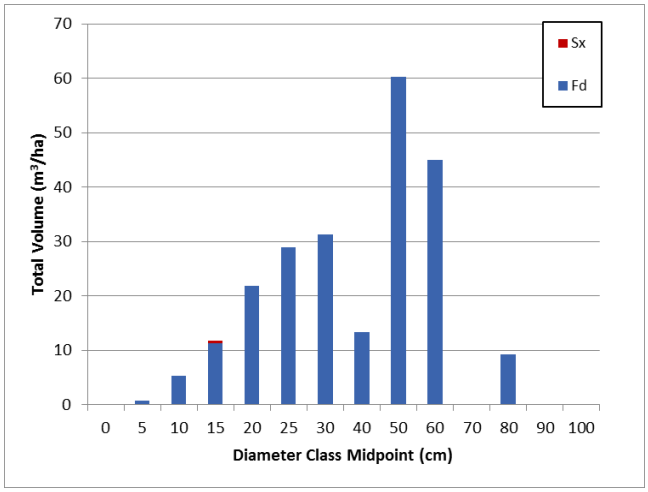




TU B

Pre-treatment stand condition (species composition by density and by volume):



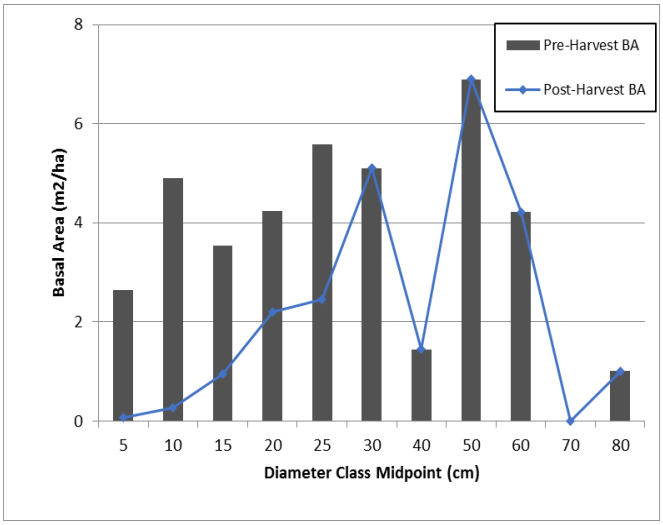


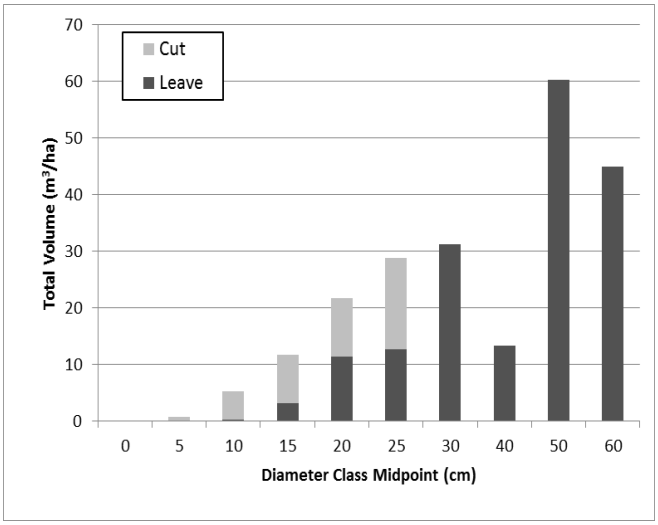
Removal specifications by stems per hectare in each size class, to achieve approximately 400 sph (+/- 50 sph) target density:

Stand Table

Stand Layer	DBH Class Midpoint	Species						Cutting Specs	Cut	Leave
		Fd	*Sx*	*Dead*	*Pl*	*At*	*Ep*			
L4	0	525		58				94%	550	33
L3	5	1158	150	258	33			98%	1567	33
L2	10	575	33	8	17			95%	600	33
L1s	15	192	8					73%	146	54
L1	20	135	0	0	0	0		48%	65	70
	25	114	0	0	0	0		56%	64	50
	30	72	0	0	0	0		0%	0	72
	40	12	0	0	0	0		0%	0	12
	50	35	0	0	0	0		0%	0	35
	60	15	0	0	0	0		0%	0	15
	70	0	0	0	0	0		0%	0	0
	80	2	0	0	0	0		0%	0	2
	90	0	0	0	0	0		0%	0	0
	100	0	0	0	0	0		0%	0	0
								Totals	**2992**	**409**

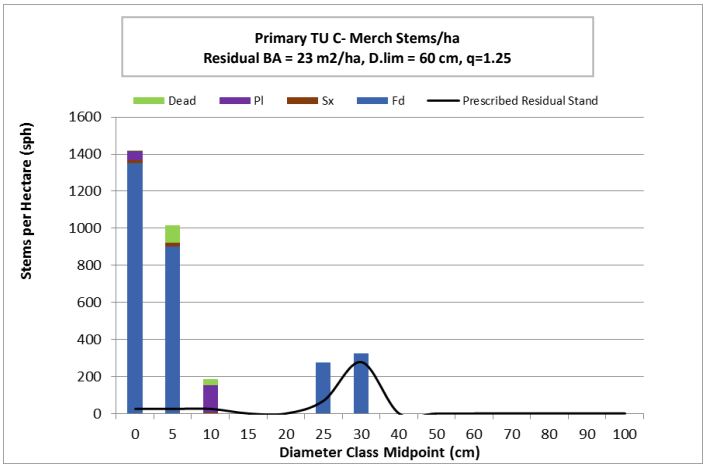
Removals, in basal area >12.5 cm dbh, and volume:

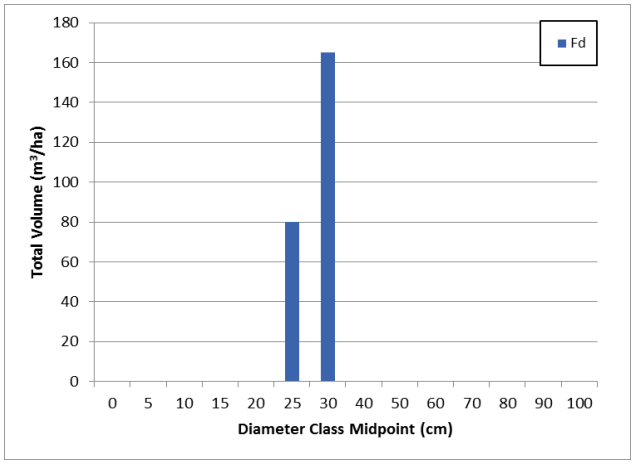




TU C

Pre-treatment stand condition (species composition by density and by volume):



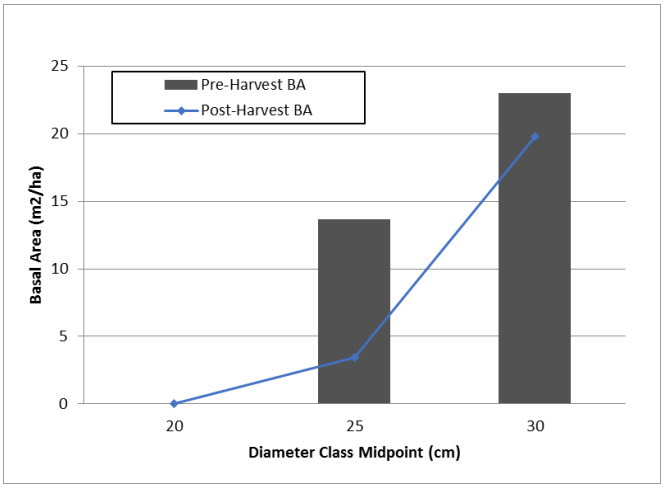


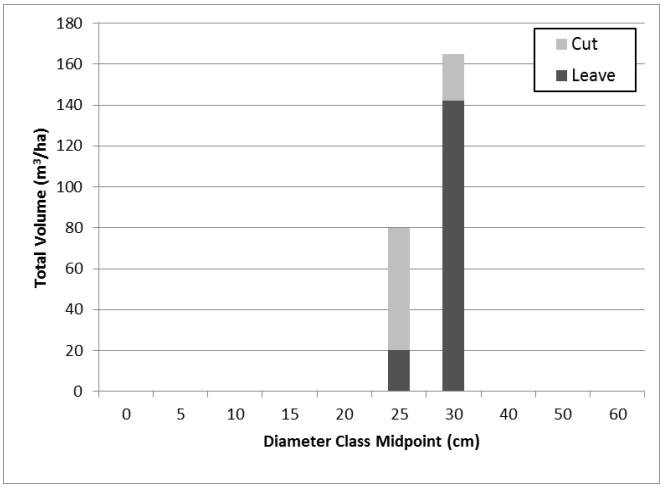
Removal specifications by stems per hectare in each size class, to achieve 425 sph (+/-50sph) target density:

Stand Table

Stand Layer	DBH Class Midpoint	Species						Cutting Specs	Cut	Leave
		Fd	*Sx*	*Dead*	*Pl*	*At*	*Ep*			
L4	0	1350			50			98%	1375	25
L3	5	900						97%	875	25
L2	10				150			84%	125	25
L1s	15							0%	0	0
L1	20	0	0	0	0	0		0%	0	0
	25	278	0	0	0	0		75%	207	71
	30	326	0	0	0	0		14%	46	280
	40	0	0	0	0	0		0%	0	0
	50	0	0	0	0	0		0%	0	0
	60	0	0	0	0	0		0%	0	0
	70	0	0	0	0	0		0%	0	0
	80	0	0	0	0	0		0%	0	0
	90	0	0	0	0	0		0%	0	0
	100	0	0	0	0	0		0%	0	0
								Totals	**2628**	**426**

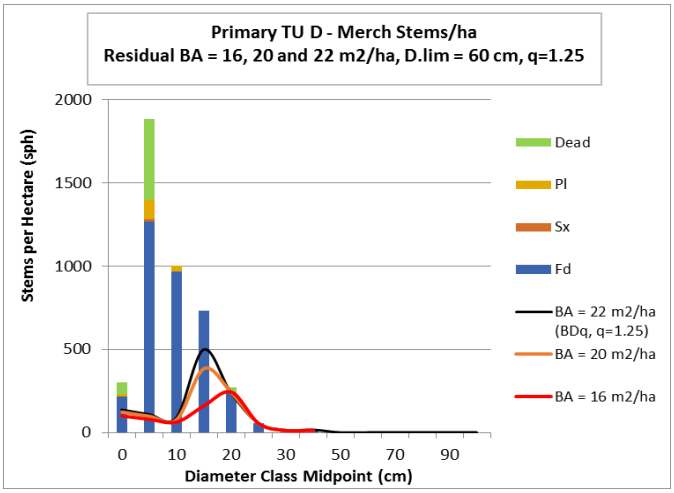
Removals by basal area >12.5 cm dbh, and by volume:

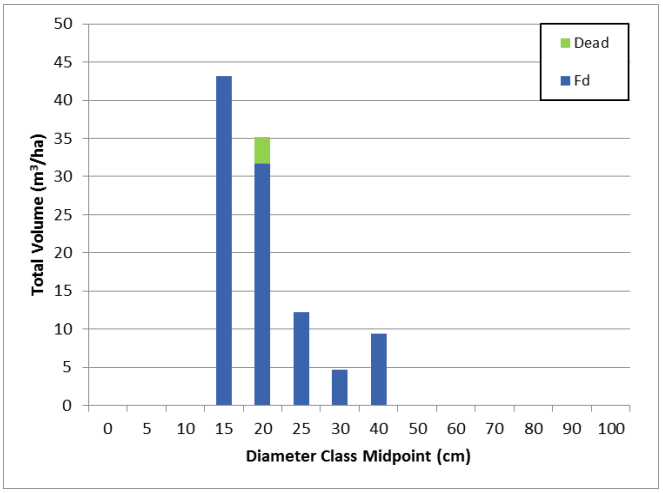




TU D

Pre-treatment stand condition (species composition by density and by volume):



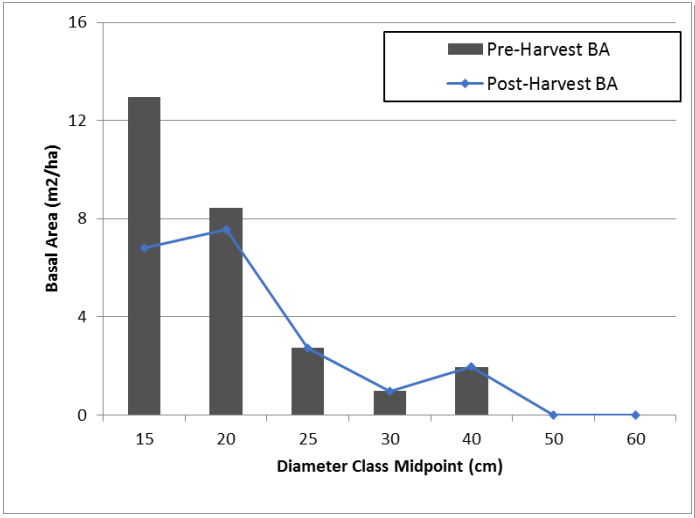


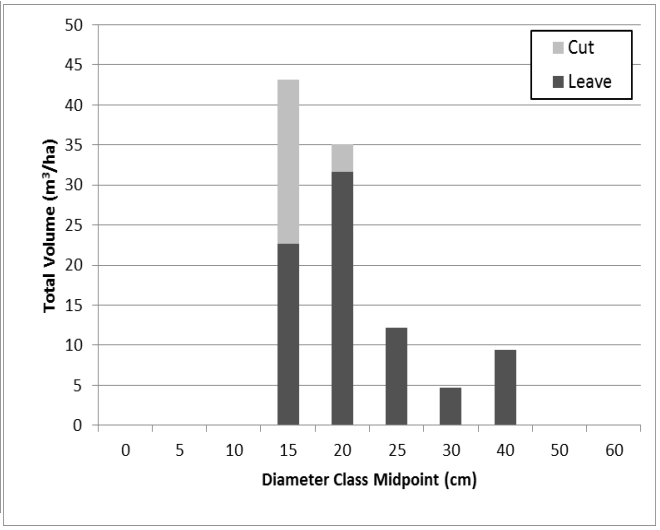
Removal specifications by stems per hectare in each size class, to achieve 1015 sph (+/-50sph) target density:

Stand Table

Stand Layer	DBH Class Midpoint	Species						Cutting Specs	Cut	Leave
		Fd	*Sx*	*Dead*	*Pl*	*At*				
L4	0	217		67	17			58%	174	126
L3	5	1267	17	483	117			95%	1785	98
L2	10	967			33			92%	920	80
L1s	15	733						48%	348	385
L1	20	241	0	27	0	0		10%	27	242
	25	56	0	0	0	0		0%	0	56
	30	14	0	0	0	0		0%	0	14
	40	16	0	0	0	0		0%	0	16
	50	0	0	0	0	0		0%	0	0
	60	0	0	0	0	0		0%	0	0
	70	0	0	0	0	0		0%	0	0
	80	0	0	0	0	0		0%	0	0
	90	0	0	0	0	0		0%	0	0
	100	0	0	0	0	0		0%	0	0
								Totals	**3255**	**1016**

Removals by basal area >12.5 cm dbh, and by volume:





B. Stand Photographs:

TU A:

Figure 1. View north from Plot 39.

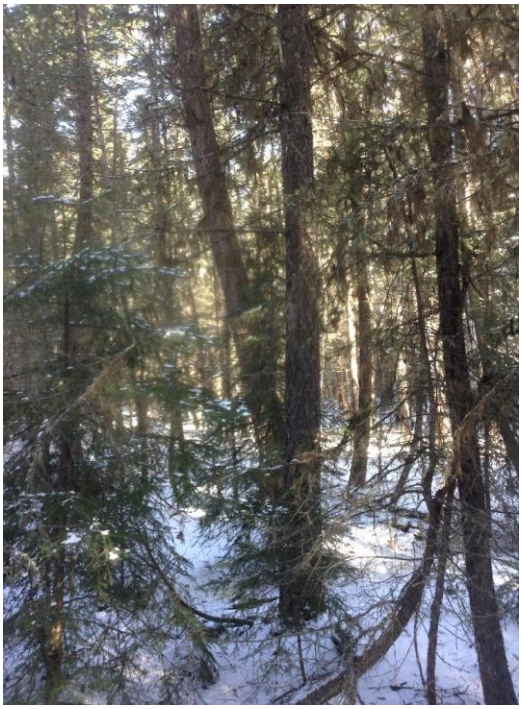


Figure 2. View north from Plot 40.

TU B:

Figure 2. View east from Plot 25.

Figure 3. View west from Plot 42.

TU C:

Figure 4. View north from Plot 14.

Figure 5. View east from Plot 15. Photo demonstrates ladder fuels and small diameter removals.

TU D:

Figure 6. View east from Plot 1 .

Figure 7. View north from Plot 4.

C. Clumpy Distribution Diagrams

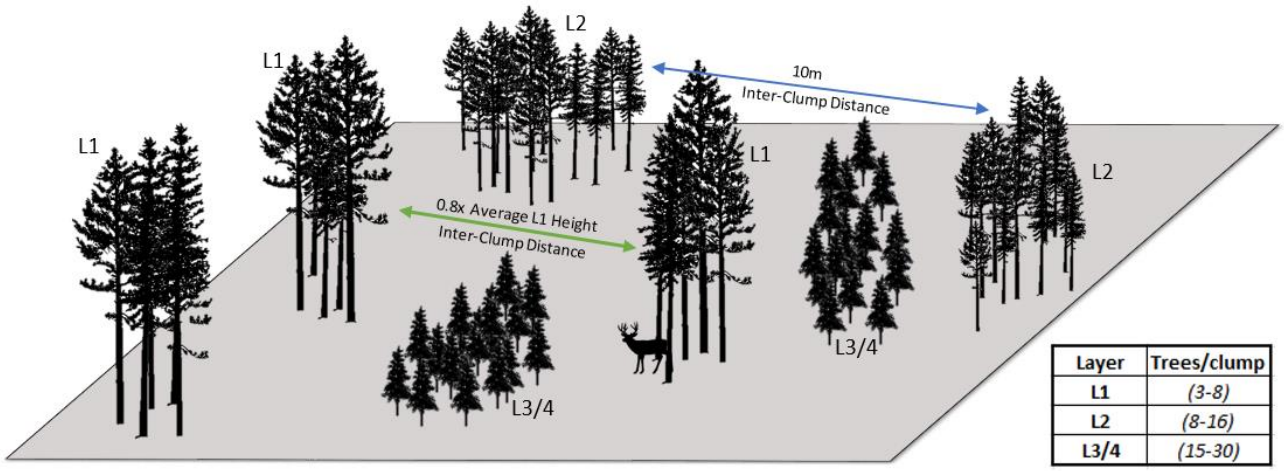


Figure 8. Example of clumpy distribution.

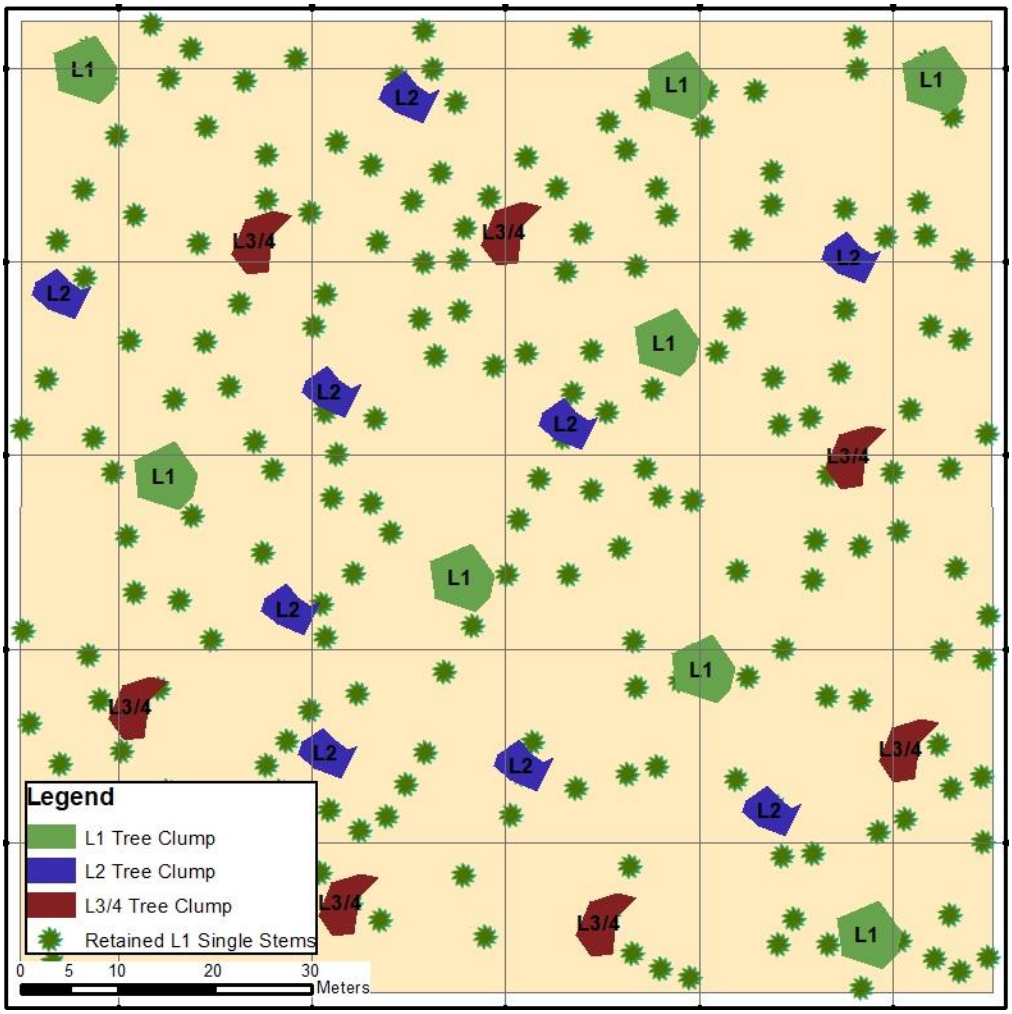


Figure 9. Example of clumpy distribution (aerial view of true hectare).

D.

Potential Species At-Risk

Bobolink (Blue listed) – Known Occurrence

Dolichonyx oryxivorus –breeding habitat includes tall grass areas, flooded meadows, prairie, deep cultivated grains, and hayfields. Nests are usually found on the ground in small hollows in areas of concealing herbaceous vegetation. Individuals tend to return to breed in the same area in successive years, especially if sites have good bobolink productivity.

General Best Management Practices:

- Avoid undue disturbance to soils and subsurface hydrology and moisture regimes. See Operational Specifications – Soil Disturbance
- Machines shall traffic designated trails/routes only.

Canopy closure shall remain relatively uniform near areas of wet soils. Avoid drastic alterations to canopy closure in or adjacent to RRZ's (i.e., avoid the creation of openings directly adjacent to marked RRZ areas).

Western Painted Turtle (Blue listed) - Known Occurrence

Although no treatment will occur within aquatic habitat and no riparian/stream crossing are proposed within this prescription; the treatment activities, in particular mechanized activities could impact resident Western Painted Turtles. A comprehensive management plan for the Western Painted Turtle[4] states that one of the main threats to this species is road mortality. These turtles are mobile and females leave their aquatic habitat in May-July and may travel overland as far as 200 m to nest. Emergence of eggs depends on the summer's warmth; however, hatchlings appear in late summer and early fall.

General Best Management Practices:

- Timing of implementation: Operations, particularly those that are mechanized, should avoid treating areas within 200 m of aquatic features within the months of May – October, if possible,
- Road mortality: Machine and vehicle operators should pay particular attention and avoid crushing or injuring the Western Painted

[4] https://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=17A03DCC-1&printfullpage=true

Turtle along the existing access routes between the months of May and October.

Great Blue Heron (Blue listed)[5] - Known Occurrence

A known Great Blue Heron colony is located a few hundred meters from the treatment area boundary. It is unknown at this time whether it is occupied or not. Although it is unlikely that fuel treatment activities will impact this colony, there is the possibility that the colony has moved into the treatment area. The chosen bird biologist will be informed of the relative location of the known colony and pay close attention for Great Blue Heron nesting or activity within the generalized vicinity and within the treatment area boundary. Regardless of the timing of the activities, operators that see multiple individuals or large nests within a tree will flag the tree 'wildlife tree' and flag a no work zone around the tree. The Contract Supervisor will coordinate with the bird biologist to survey the tree to determine future management of the area.

General Best Management Practices:

See above for specific instructions.

Western Toad (Yellow listed) – Potential Occurrence

Western Toads are protected under the British Columbia *Wildlife Act*. Adult Western Toads migrate to communal wetland breeding sites in early spring[6]. Western Toads are generally active between January and October with breeding and egg deposition occurring between April and July.

General Best Management Practices:

- Timing of implementation: Operations, particularly those that are mechanized, should avoid treating areas within the vicinity of riparian features within the months of May – October, if possible,
- Road mortality: Machine and vehicle operators should pay particular attention and avoid crushing or injuring the Western Painted Turtle along the existing access routes between the months of May and October.

[5] http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/Fact-Sheet-11-herons.pdf

[6] http://www.env.gov.bc.ca/wld/frogwatch/publications/factsheets/frogs/western-toad.htm

Olive-sided Flycatcher (Blue listed) – Potential Occurrence

This species appears to prefer cool, mesic or moist conifer forest with tall trees; however, it will occupy younger forest with scattered tall trees or snags[7]. Dead treetops or tall snags are heavily used as foraging locations, much more so than by most other North American flycatchers.

General Best Management Practices:

- The chosen bird biologist for this project will be informed of the potential presence of this bird and the bird biologist will work with the Contract Supervisor and Contractor to adapt operational plans as practicable.

Lewis's Woodpecker (Blue listed) – Potential Occurrence

This bird is typically found in the Okanagan area of BC; however, there are individuals found outside of this area. They are likely to be found wherever there are mature ponderosa pine forests[8].

General Best Management Practices:

- The chosen bird biologist for this project will be informed of the potential presence of this bird and the bird biologist will work with the Contract Supervisor and Contractor to adapt operational plans as practicable.

[7] http://www.birdatlas.bc.ca/accounts/speciesaccount.jsp?sp=OSFL&lang=en

[8] https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/species-ecosystems-at-risk/brochures/lewis_woodpecker.pdf

Flammulated Owl (Blue listed) – Potential Occurrence

This species occurs in the elevational band characterized by dry Douglas-fir forests along the upload slopes of the major drainages of the sourthern region of the province[9].

General Best Management Practices:

- The chosen bird biologist for this project will be informed of the potential presence of this bird and the bird biologist will work with the Contract Supervisor and Contractor to adapt operational plans as practicable.

Black Swift (Blue listed) – Potential Occurrence

Although little is known about where these birds nest, there remains the possibility that these birds are using or nesting within the treatment area. These birds spend a significant amount of their time in the air[10] .

General Best Management Practices:

- The chosen bird biologist for this project will be informed of the potential presence of this bird and the bird biologist will work with the Contract Supervisor and Contractor to adapt operational plans as practicable.

Spotted Bat (Blue listed) – Potential Occurrence

[9] http://www.env.gov.bc.ca/wld/frpa/iwms/documents/Birds/b_flammulatedowl.pdf

[10] http://www.birdatlas.bc.ca/accounts/speciesaccount.jsp?sp=BLSW&lang=en

The Spotted Bat is a large, unusually coloured bat, with a wingspan of about 35 cm. These bats are believed to roost on canyon and vertical cliff walls where they rear their young[11].

General Best Management Practices:

- This bat has not been sited in the proposed treatment area; however, the Contractor and Contract Supervisor should pay attention for its presence. If a bat is observed, the bat should be photographed and the bat species identified by an RPBio.

Little Brown Myotis (Blue listed) – Potential Occurrence

This bat species uses a variety of habitat including dry open forests[12] and will roost in tree cavities, snags or under loose bark.

General Best Management Practices:

- This bat has not been sited in the proposed treatment area; however, the Contractor and Contract Supervisor should pay attention for its presence. If a bat is observed, the bat should be photographed and the bat species identified by an RPBio.

Northern Myotis (Blue listed) – Potential Occurrence

This bat will roost in trees during the spring and summer and these trees tend to be close together and within about 600 m of areas suitable for foraging[13].

[11] https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/species-ecosystems-at-risk/brochures/spotted_bat.pdf

[12] http://a100.gov.bc.ca/appsdata/acat/documents/r1535/whr_4162_mmylu_1096575272026_68741ea2adba46dcb522d7a9f909273a.pdf

[13] https://en.wikipedia.org/wiki/Northern_long-eared_bat_(myotis)

General Best Management Practices:

- This bat has not been sited in the proposed treatment area; however, the Contractor and Contract Supervisor should pay attention for its presence. If a bat is observed, the bat should be photographed and the bat species identified by an RPBio.

Wolverine (Blue listed) – Potential Occurrence

Wolverine tend to travel and forage alone and in very remote areas which makes the presence of the wolverine within the proposed treatment area very unlikely[14].

General Best Management Practices:

- The wolverine has not been sited in the proposed treatment area; however, the Contractor and Contract Supervisor should pay attention for its presence. If it is observed, it should be photographed and determined if the wolverine is living within the treatment area. If the wolverine is living within the treatment area and the den is located, considerations should be made to create a no work zone surrounding the den.

Grizzly Bear (Blue listed) – Potential Occurrence

It is unlikely that a Grizzly Bear will be sited within the proposed treatment area, see General Best Management Practices as they pertain to the prescription, below.

[14] http://www.env.gov.bc.ca/fw/wildlife/trapping/docs/wolverine.pdf

General Best Management Practices:

- The Contractor and Contract Supervisor should pay attention for its presence. If it is observed, it should be photographed and determined if the bear is living within the treatment area. If the bear is living within the treatment area and the den is located, considerations should be made to create a no work zone surrounding the den.

Fisher (Blue listed) – Potential Occurrence

The fisher is a forest-dwelling animal and, in the west, is associated primarily with coniferous and mixed forest habitats[15]. Riparian areas, including deciduous trees are important habitat and their dens have been located within deciduous trees. It's presence in the proposed fuel break is unlikely.

General Best Management Practices:

- The Contractor and Contract Supervisor should pay attention for its presence. If it is observed, it should be photographed and determined if the fisher is living within the treatment area. If the fisher is living within the treatment area and the den is located, considerations should be made to create a no work zone surrounding the den.

Ecological Communities At-Risk

Alkali Saltgrass herbaceous vegetation/Alkali Saltgrass and the Nuttall's Alkaligrass ecological communities (Red Listed) - Potential Occurrence

The first two potential communities share similar species and ecological characteristics and include:

- Alkali Saltgrass herbaceous vegetation (found in the: IDFdk3/Gs01, IDFdk3/Gs01)[16], and

[15] http://www.env.gov.bc.ca/fw/wildlife/trapping/docs/fisher.pdf

[16] http://www.env.gov.bc.ca/wld/frpa/iwms/documents/Plant%20Communities/pc_alkalisaltgrass.pdf

- Alkali Saltgrass – Nuttall's Alkaligrass (found in the: IDFdk3, IDFxm)[17].

The Alkali Saltgrass herbaceous vegetation community is a wetland meadow community which occurs in seasonally flooded areas often associated with saline/alkaline potholes and lakes. Alkali Saltgrass – Nuttalls's Alkaligrass generally forms a good ground cover of closely spaced bunchgrass plants in pure stands and is found in alkaline and wet environments dominated by clay soils.

Alkali Saltgrass

Nuttall's Alkaligrass

General Best Management Practices:

- It is unlikely that these ecological communities exist within the proposed treatment areas.
- If this ecological community is identified, it will be excluded from the prescription area entirely.
- No temporary access or treatment activities will occur within the ecological community area.

Douglas-fir – common juniper – clad lichen ecological community (Red Listed) - Potential Occurrence

The Douglas-fir -common juniper-clad lichen community is geographically restricted to the IDFxm3[18] and is characterized by a dry open canopy forest dominated by lodgepole pine and Douglas-fir. The few remaining occurrences of this ecological community are not located within the proposed treatment area.

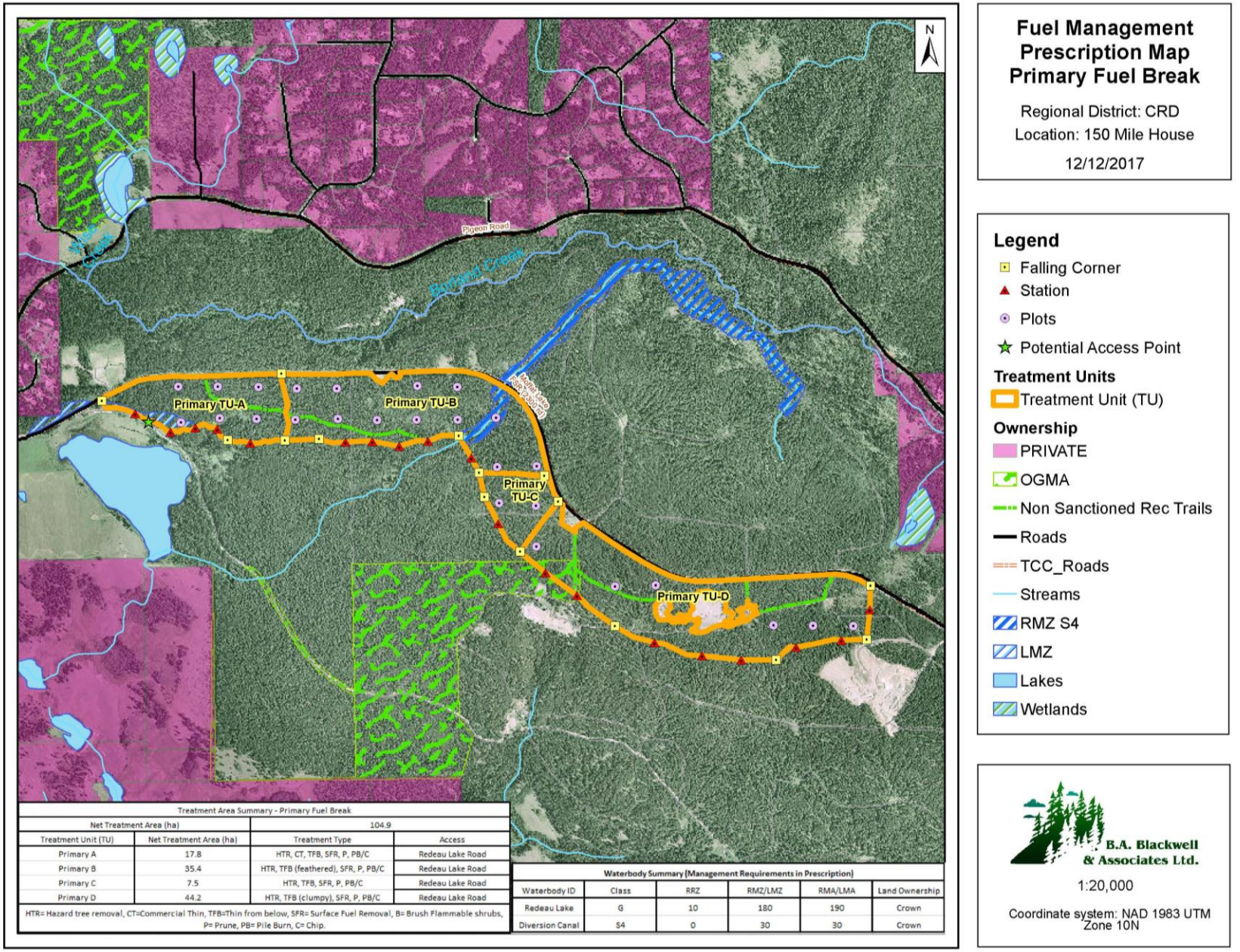
General Best Management Practices:

[17] https://www.for.gov.bc.ca/hra/ecology/types/NutallsSaltGrass.pdf

[18] http://www.env.gov.bc.ca/wld/frpa/iwms/documents/Plant%20Communities/pc_douglasfirjunipercladonia.pdf

- It is unlikely that this ecological community exists within the proposed treatment areas.
- If this ecological community is identified, it will be excluded from the prescription area entirely.
- No temporary access or treatment activities will occur within the ecological community area.

E. Maps



Treatment Area Summary - Primary Fuel Break

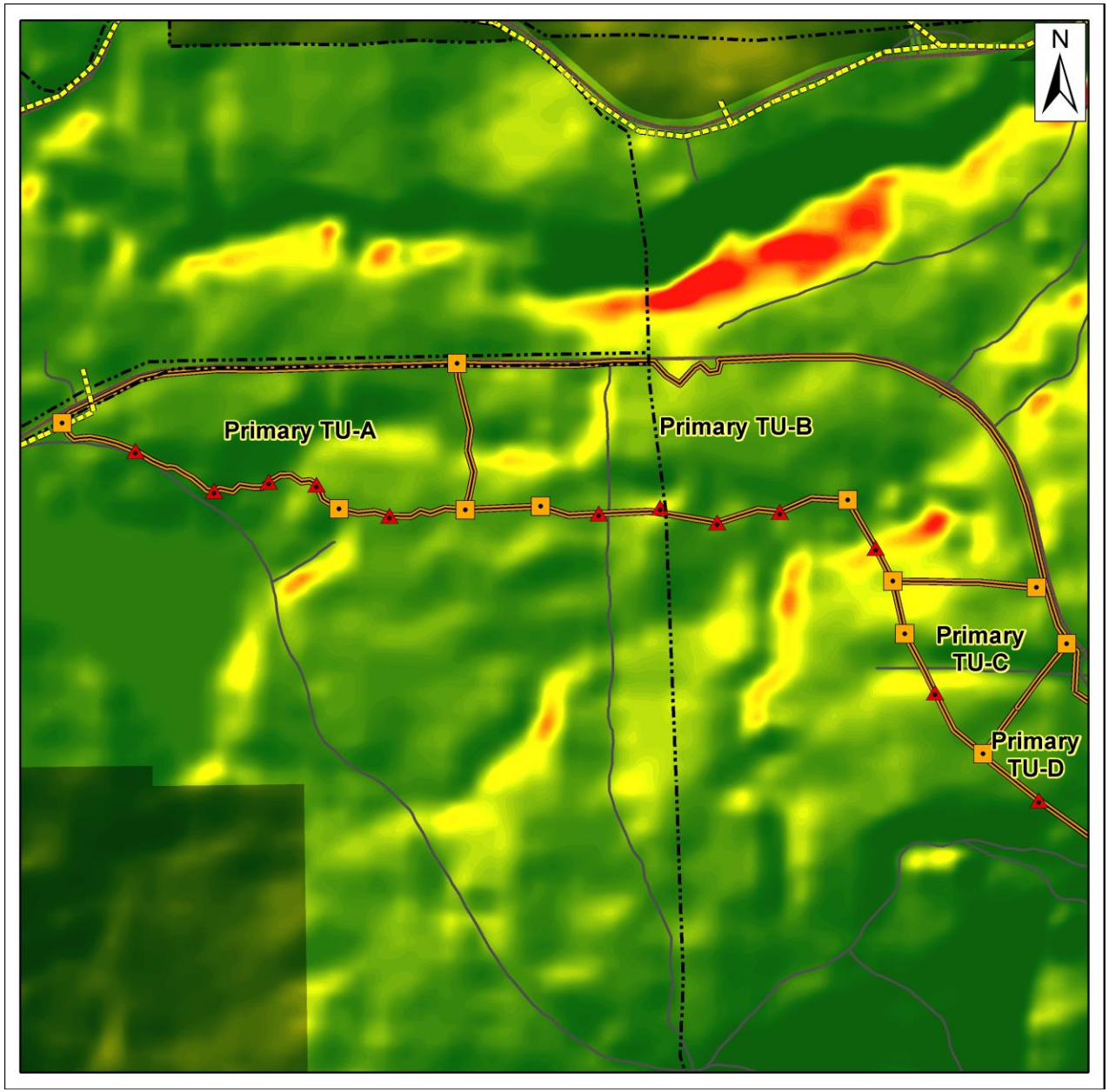
Net Treatment Area (ha)		104.9	
Treatment Unit (TU)	Net Treatment Area (ha)	Treatment Type	Access
Primary A	17.8	HTR, CT, TFB, SFR, P, PB/C	Redeau Lake Road
Primary B	35.4	HTR, TFB (feathered), SFR, P, PB/C	Redeau Lake Road
Primary C	7.5	HTR, TFB, SFR, P, PB/C	Redeau Lake Road
Primary D	44.2	HTR, TFB (clumpy), SFR, P, PB/C	Redeau Lake Road

HTR= Hazard tree removal, CT=Commercial Thin, TFB=Thin from below, SFR= Surface Fuel Removal, B= Brush Flammable shrubs, P= Prune, PB= Pile Burn, C= Chip.

Waterbody Summary (Management Requirements in Prescription)

Waterbody ID	Class	RRZ	RMZ/LMZ	RMA/LMA	Land Ownership
Redeau Lake	G	10	180	190	Crown
Diversion Canal	S4	0	30	30	Crown

Map 1. Overview map of proposed Primary fuel break treatment units.



Fuel Management Prescription Map
Primary Treatment Units
Map 1 of 2

Regional District: CRD
Location: 150 Mile House

25 January 2018

Legend

- Falling Corner
- Station
- Powerlines Overhead
- Fences
- Treatment Unit Boundary
- TCC Roads
- Roads

Ownership

- Private

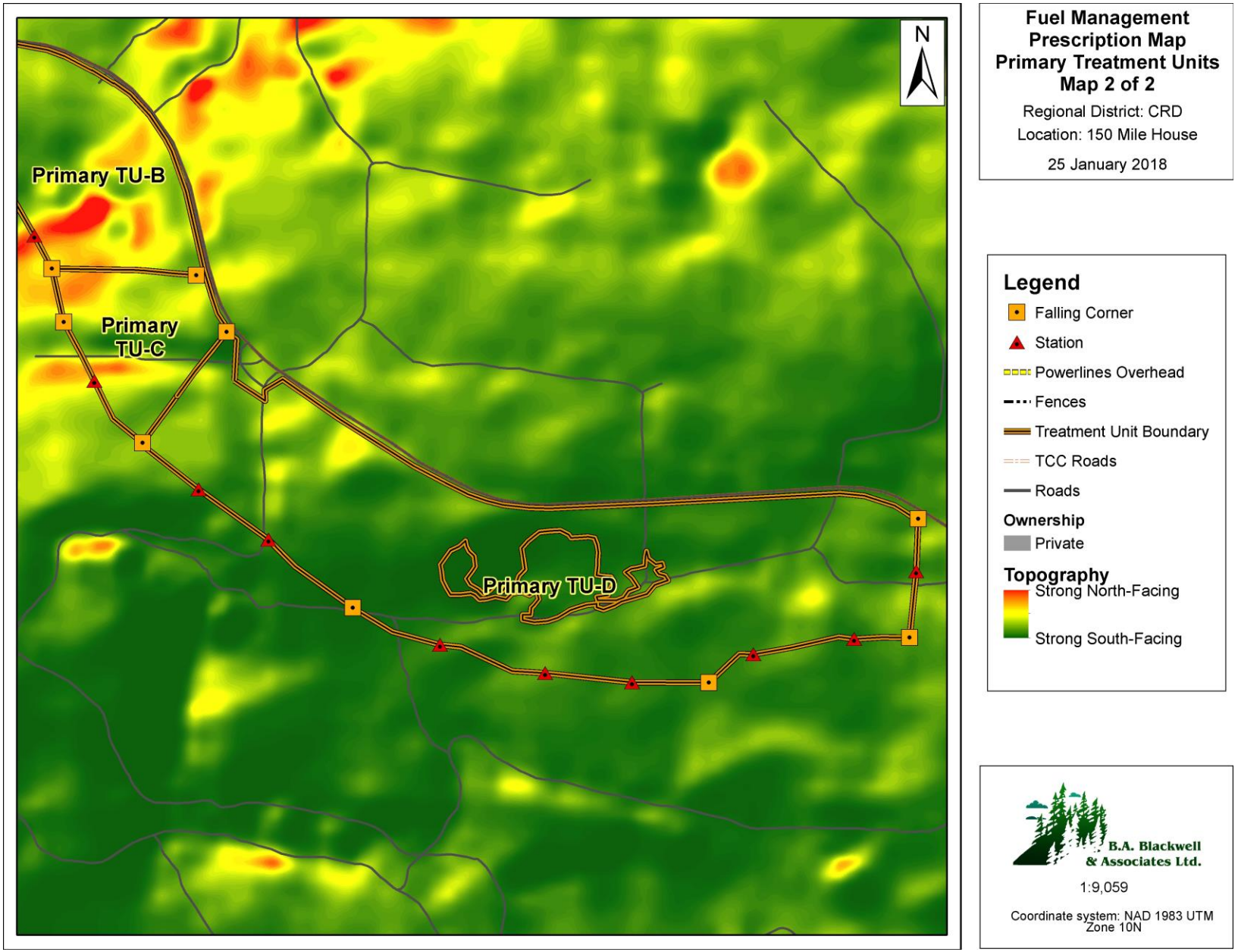
Topography

- Strong North-Facing
- Strong South-Facing

B.A. Blackwell & Associates Ltd.

1:10,466

Coordinate system: NAD 1983 UTM Zone 10N



Map 2. Primary TU-D Hillshade map.

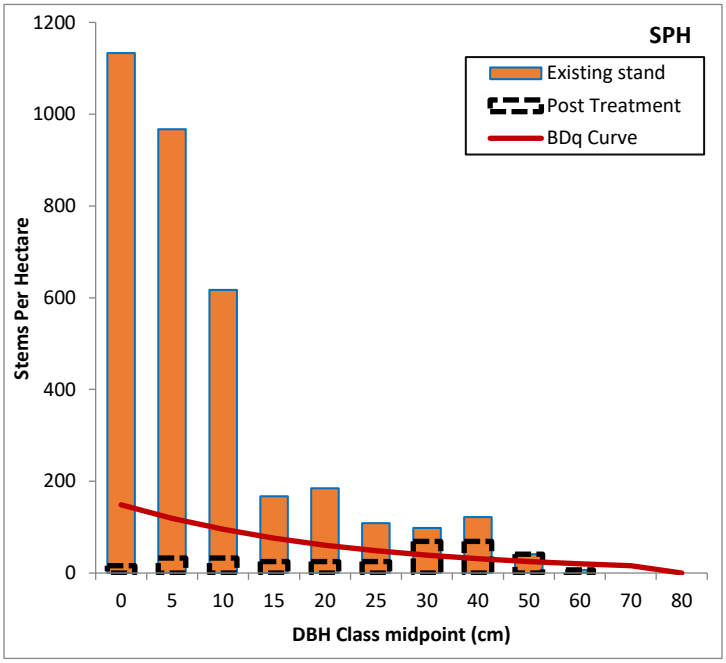
Appendix F: Additional Cutting Specifications and Basal Area Targets: Borland Valley Primary Fuel Break Treatments

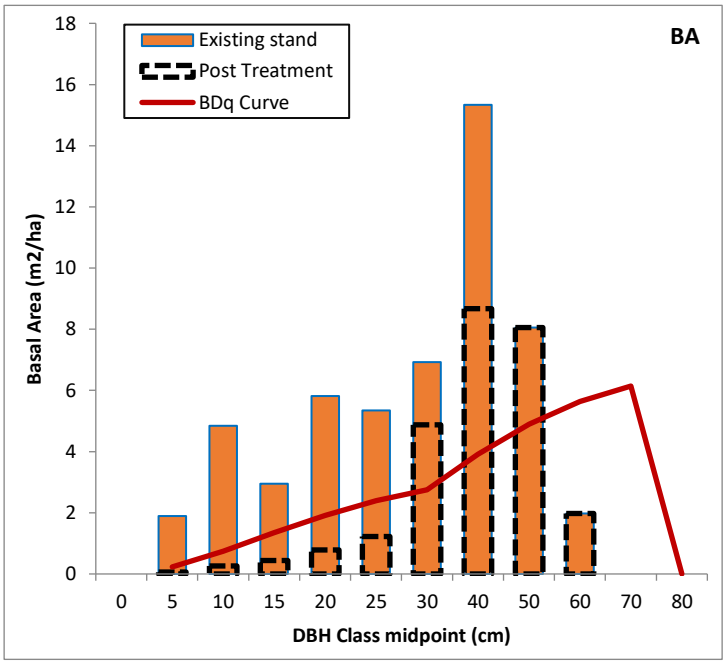
Primary TU-A: Post treatment BA target >12.5cm dbh: 26 m²/ha

BDQ Manager

B:	29	Min BA for B	
D:	70	12.5	
q:	1.25		

DBH Class	BDq Curve				Existing stand		Treatment Removal		Post Treatment	
	qsph	BA	q planned sph	q planned BA	sph	Ba/ha	sph	Ba/ha	sph	Ba/ha
0	9.3	0.00	**149**		1133	0.0	1117	0.0	16	0.0
5	7.5	0.01	**119**	**0.23**	967	1.9	934	1.8	33	0.1
10	6.0	0.05	**95**	**0.75**	617	4.8	584	4.6	33	0.3
15	4.8	0.08	**76**	**1.34**	167	3.0	142	2.5	25	0.4
20	3.8	0.12	**61**	**1.91**	185	5.8	160	5.0	25	0.8
25	3.1	0.15	**49**	**2.39**	109	5.4	84	4.1	25	1.2
30	2.4	0.17	**39**	**2.75**	98	6.9	29	2.0	69	4.9
40	2.0	0.25	**31**	**3.92**	122	15.3	53	6.7	69	8.7
50	1.6	0.31	**25**	**4.90**	41	8.1	0	0.0	41	8.1
60	1.3	0.35	**20**	**5.64**	7	2.0	0	0.0	7	2.0
70	1.0	0.38	**16**	**6.14**	0	0.0	0	0.0	0	0.0
80	0.0	0.00	**0**	**0.00**	0	0.0	0	0.0	0	0.0
Total		1.88	**679**	**29.98**	**3446**	**53.1**	**3103**	**26.8**	**343**	**26.4**
>37.5		1.3	92.0	20.6	170.0	25.4	53.0	6.7	117.0	18.7
>17.5		1.7	240.6	27.7	562.0	43.5	326.0	17.9	236.0	25.6
>12.5		1.8	316.7	29.0	729.0	46.4	468.0	20.4	261.0	26.0
>minBA		1.8	316.7	29.0	729.0	46.4	468.0	20.4	261.0	26.0



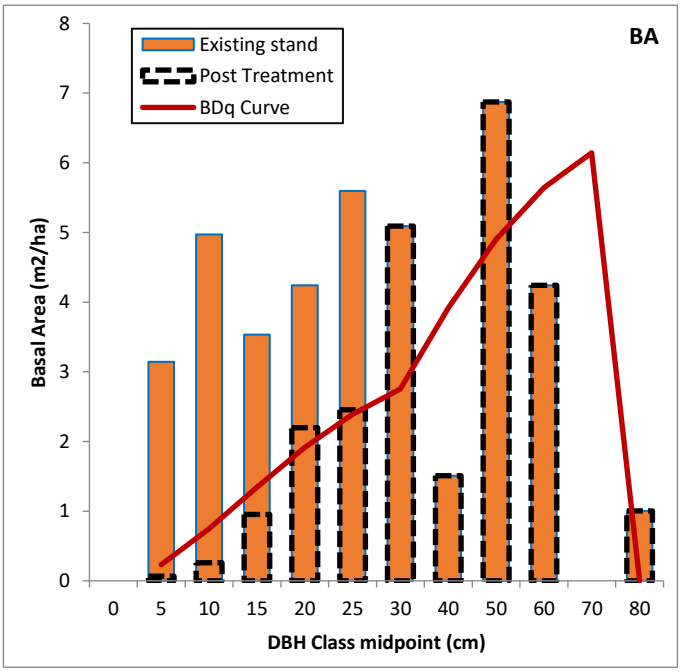


Primary TU-B: Post treatment BA target >12.5cm dbh: 24 m^2/ha

BDQ Manager

B:	29	Min BA for B	
D:	70	12.5	
q:	1.25		

DBH Class	BDq Curve				Existing stand		Treatment Removal		Post Treatment	
	qsph	BA	q planned sph	q planned BA	sph	Ba/ha	sph	Ba/ha	sph	Ba/ha
0	9.3	0.00	**149**		585	0.0	550	0.0	35	0.0
5	7.5	0.01	**119**	**0.23**	1600	3.1	1567	3.1	33	0.1
10	6.0	0.05	**95**	**0.75**	633	5.0	600	4.7	33	0.3
15	4.8	0.08	**76**	**1.34**	200	3.5	146	2.6	54	1.0
20	3.8	0.12	**61**	**1.91**	135	4.2	65	2.0	70	2.2
25	3.1	0.15	**49**	**2.39**	114	5.6	64	3.1	50	2.5
30	2.4	0.17	**39**	**2.75**	72	5.1	0	0.0	72	5.1
40	2.0	0.25	**31**	**3.92**	12	1.5	0	0.0	12	1.5
50	1.6	0.31	**25**	**4.90**	35	6.9	0	0.0	35	6.9
60	1.3	0.35	**20**	**5.64**	15	4.2	0	0.0	15	4.2
70	1.0	0.38	**16**	**6.14**	0	0.0	0	0.0	0	0.0
80	0.0	0.00	**0**	**0.00**	2	1.0	0	0.0	2	1.0
Total		1.88	**679**	**29.98**	**3403**	**40.2**	**2992**	**15.6**	**411**	**24.6**
>37.5		1.3	92.0	20.6	64.0	13.6	0.0	0.0	64.0	13.6
>17.5		1.7	240.6	27.7	385.0	28.6	129.0	5.2	256.0	23.4
>12.5		1.8	316.7	29.0	585.0	32.1	275.0	7.8	310.0	24.3
>minBA		1.8	316.7	29.0	585.0	32.1	275.0	7.8	310.0	24.3

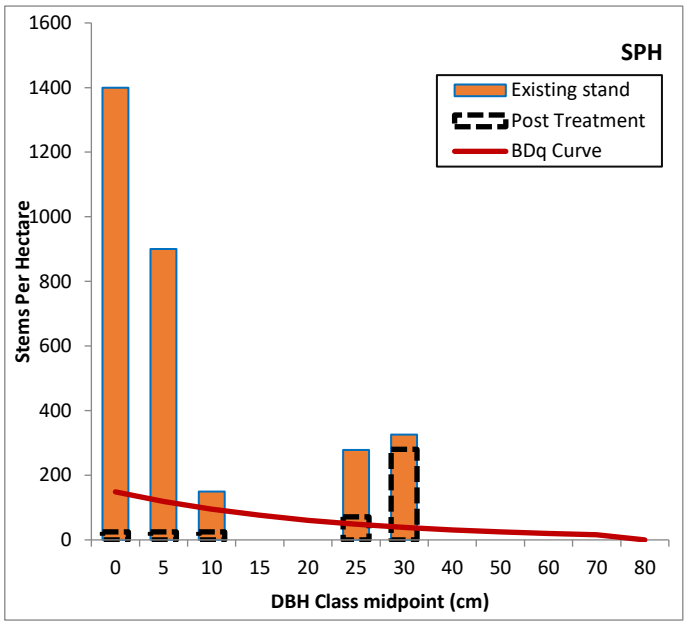


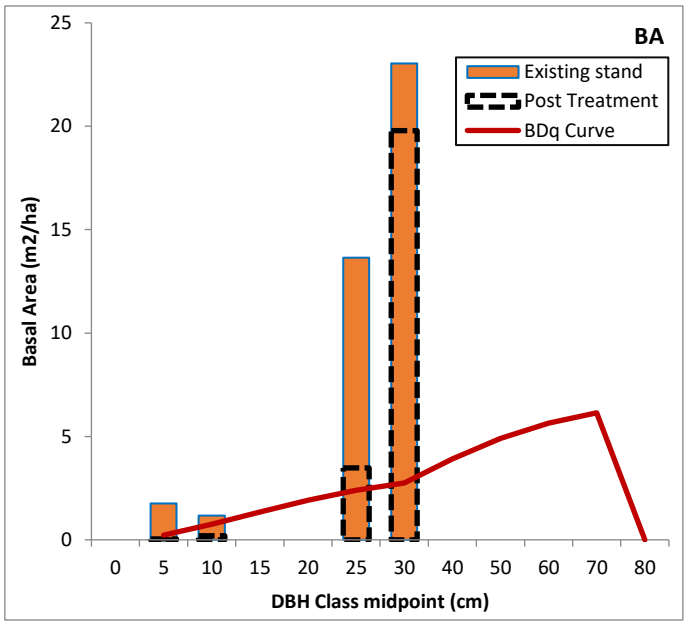
Primary TU-C: Post treatment BA target >12.5cm dbh: 23 m^2/ha

BDQ Manager

B:	29	Min BA for B	
D:	70	12.5	
q:	1.25		

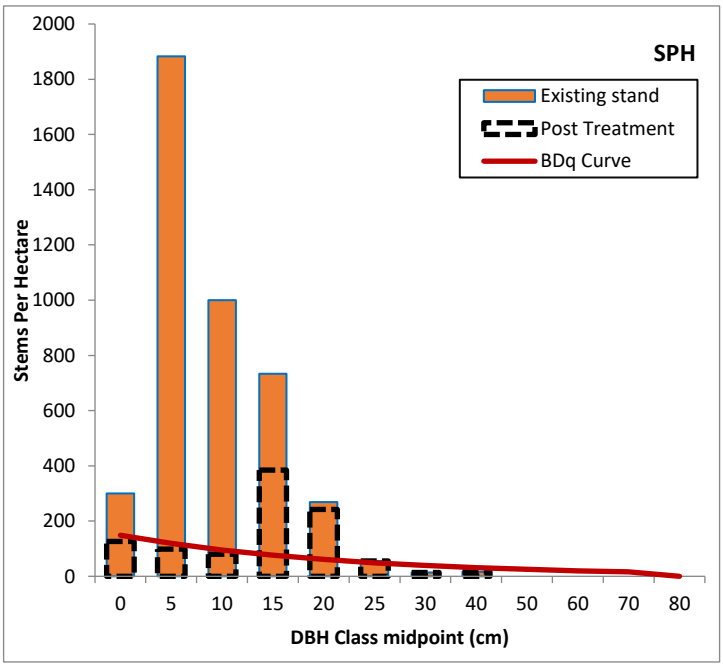
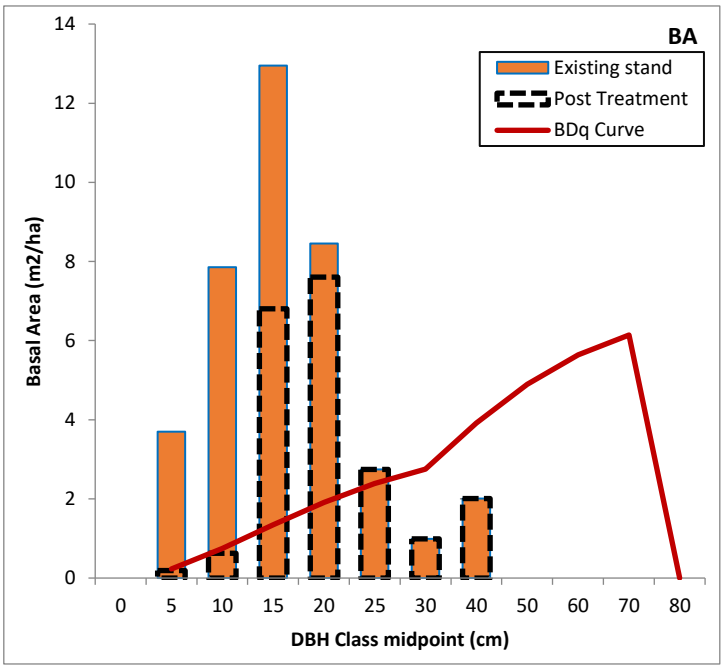
DBH Class	BDq Curve				Existing stand		Treatment Removal		Post Treatment	
	qsph	BA	q planned sph	q planned BA	sph	Ba/ha	sph	Ba/ha	sph	Ba/ha
0	9.3	0.00	**149**		1400	0.0	1375	0.0	25	0.0
5	7.5	0.01	**119**	**0.23**	900	1.8	875	1.7	25	0.0
10	6.0	0.05	**95**	**0.75**	150	1.2	125	1.0	25	0.2
15	4.8	0.08	**76**	**1.34**	0	0.0	0	0.0	0	0.0
20	3.8	0.12	**61**	**1.91**	0	0.0	0	0.0	0	0.0
25	3.1	0.15	**49**	**2.39**	278	13.6	207	10.2	71	3.5
30	2.4	0.17	**39**	**2.75**	326	23.0	46	3.3	280	19.8
40	2.0	0.25	**31**	**3.92**	0	0.0	0	0.0	0	0.0
50	1.6	0.31	**25**	**4.90**	0	0.0	0	0.0	0	0.0
60	1.3	0.35	**20**	**5.64**	0	0.0	0	0.0	0	0.0
70	1.0	0.38	**16**	**6.14**	0	0.0	0	0.0	0	0.0
80	0.0	0.00	**0**	**0.00**	0	0.0	0	0.0	0	0.0
Total		1.88	**679**	**29.98**	**3054**	**39.6**	**2628**	**16.1**	**426**	**23.5**
>37.5		1.3	92.0	20.6	0.0	0.0	0.0	0.0	0.0	0.0
>17.5		1.7	240.6	27.7	604.0	36.7	253.0	13.4	351.0	23.3
>12.5		1.8	316.7	29.0	604.0	36.7	253.0	13.4	351.0	23.3
>minBA		1.8	316.7	29.0	604.0	36.7	253.0	13.4	351.0	23.3





Primary TU-D: Post treatment BA target >12.5cm dbh: 20 m²/ha

BDQ Manager

B:	29	Min BA for B	
D:	70	12.5	
q:	1.25		

DBH Class	BDq Curve				Existing stand		Treatment Removal		Post Treatment	
	qsph	BA	q planned sph	q planned BA	sph	Ba/ha	sph	Ba/ha	sph	Ba/ha
0	9.3	0.00	**149**		300	0.0	174	0.0	126	0.0
5	7.5	0.01	**119**	**0.23**	1883	3.7	1785	3.5	98	0.2
10	6.0	0.05	**95**	**0.75**	1000	7.9	920	7.2	80	0.6
15	4.8	0.08	**76**	**1.34**	733	13.0	348	6.1	385	6.8
20	3.8	0.12	**61**	**1.91**	269	8.5	27	0.8	242	7.6
25	3.1	0.15	**49**	**2.39**	56	2.7	0	0.0	56	2.7
30	2.4	0.17	**39**	**2.75**	14	1.0	0	0.0	14	1.0
40	2.0	0.25	**31**	**3.92**	16	2.0	0	0.0	16	2.0
50	1.6	0.31	**25**	**4.90**	0	0.0	0	0.0	0	0.0
60	1.3	0.35	**20**	**5.64**	0	0.0	0	0.0	0	0.0
70	1.0	0.38	**16**	**6.14**	0	0.0	0	0.0	0	0.0
80	0.0	0.00	**0**	**0.00**	0	0.0	0	0.0	0	0.0
Total		1.88	**679**	**29.98**	**4271**	**38.7**	**3254**	**17.7**	**1017**	**21.0**
>37.5		1.3	92.0	20.6	16.0	2.0	0.0	0.0	16.0	2.0
>17.5		1.7	240.6	27.7	355.0	14.2	27.0	0.8	328.0	13.4
>12.5		1.8	316.7	29.0	1088.0	27.2	375.0	7.0	713.0	20.2
>minBA		1.8	316.7	29.0	1088.0	27.2	375.0	7.0	713.0	20.2