

SITE PLAN CP 408 BLOCK 10 COOPER CREEK CEDAR LTD.

A. TENURE IDENTIFICATION

LICENCE NO.: FL A30171	CP: 408	BLOCK: 10	TIMBER MARK: FE5408	UTM: 498758E, 5573338N	LICENSEE NAME: Cooper Creek Cedar (CCC)
AREA UNDER TENURE (ha): 42.9	MAPSHEET/OPENING #: 82K.035	ELEVATION: 775-900m	LOCATION: Greyhorse		

B. AREA SUMMARY

AREA OF NO PLANNED REFORESTATION (ha) (NPR)									
PERMANENT ACCESS	ROCK	WATER	SWAMP	OTHER NP	NC>4ha	WILDLIFE TREE RETENTION AREA (HA):	IMMATURE	OTHER (NP Brush)	TOTAL NPR AREA
2.1	-	-	-	-	-	4.9	-	-	7.0
NET AREA TO BE REFORESTED (ha)									
SU	SU AREA DESCRIPTION								NET AREA TO BE REFORESTED:
A	<p>ICH mw2 101⁷ 104² 110¹</p> <p>Aspect is predominantly West facing. Slope position is lower to middle, with short and long discontinuous slopes. Slopes range from 5 – 60%, however most of the area has slopes <35%. Surface soils contain Silty Loam (SiL) to Loam (L) textures, and subsoils contain Silt (Si) to Loam (L) textures. Soils are moderately well drained. Coarse fragment content is low to moderate (25 - 40%). Moisture regime is predominantly mesic, and nutrient regime is medium. Humus form is a thin mor (3.0 cm thickness on average). Rooting depth is 30-35 cm.</p> <p>Average stand density (all species) is 692 stems/ha. Most stems fall within the 20-50cm DBH classes, with <5% of stems in the 55-150cm DBH classes. Approximate species densities are Hw 460 stems/ha, Cw 127 stems/ha, Fd 60 stems/ha, Lw 38 stems/ha, At 7 stems/ha. The understory contains moderate to high densities of Cw Hw regen, saplings and poles that are mostly suppressed and in poor condition, but saplings and regen growing in canopy openings are in good condition. There are also 145 stems/ha of dead LwEp (FdCwPwHw), mainly in the 20-50cm DBH classes.</p> <p>SU A has Non-Sensitive soils.</p> <p>SU A will be logged via ground based harvest methods and a clearcut silviculture system.</p>								19.1
B	<p>ICH mw2 104⁹ 101¹</p> <p>Aspect is predominantly West facing. Slope position is lower to middle, with mainly short and long broken, discontinuous slopes. Slopes range from 5 – 80%, however most of the area has slopes <35%. Surface soils and subsoils contain Silty Loam (SiL) to Sandy Loam (SL) textures. Soils are moderately well to well drained. Coarse fragment content is low (20-30%) in surface horizons and moderate (45-60%) in subsoils. Moisture regime is predominantly submesic, and nutrient regime is medium. Humus form is a thin mor (3-4 cm thickness on average). Rooting depth is 25-35cm.</p> <p>Average stand density and description is similar to SU A (see above).</p> <p>SU B has Non-Sensitive soils.</p> <p>SU B will be logged via ground based harvest methods and a clearcut silviculture system.</p>								16.8
TOTAL NET AREA TO BE REFORESTED:								35.9	
TOTAL AREA UNDER THE PLAN:								42.9	

SOIL DISTURBANCE

SU	Max. Allowable Soil Disturbance (%)	Max. Amount TAS May Exceed MASD Prior to Rehab (%)	Max. Allowable Soil Disturbance For Roadside Work Areas (%)	Maximum Permanent Access Structures (%)
A	10.0	5.0	25.0	4.9%
B	10.0	5.0		

SU	CRITICAL SITE CONDITIONS THAT AFFECT THE TIMING OF OPERATIONS AND HOW THEY AFFECT THEM
A, B	<ul style="list-style-type: none"> Avoid machine travel during periods of soil saturation to reduce soil compaction and soil displacement risk. Use designated harvesting trails during summer months, or a supporting snow pack in the winter. Spot piling along roadsides, landings, and within the NAR may be necessary to remedy high levels of coarse woody debris.

RESULTS AND STRATEGIES

Biodiversity Objectives	
Result or Strategy Description	3.5.3 - Old and Mature Forest
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	'KBHLP Objective 2 – Old & Mature Forests' 'KBHLP Objective 5 – Connectivity' Field data collection found this block to be ICH mw2, and the block lies within Connectivity Corridor. For the ICH mw2, there is a Mature + Old forest requirement in this landscape unit (K17), and the Old forest target is met with OGMA area. Analysis completed by Timberland (Sept 6, 2018) shows that post-harvest there will be a surplus of Mature + Old within the Landscape Unit ICH mw2 as a whole, and also within connectivity corridor.
Result or Strategy Description	3.5.3 - Green-up
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	'KBHLP Objective 4 – Green-up' – The proposed cutblock is consistent with FPPR Section 65(2).
Result or Strategy Description	3.5.1 - Objectives set by Government for Biodiversity – Landscape Level
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	Biodiversity Emphasis. 'KBHLP Objective 4 – Green-up' The proposed cutblock and adjacent cutblocks comply with Sections 64 and 65 of the FPPR.
Cultural Heritage Resources	
Result or Strategy Description	3.7 - Objectives set by Government for Cultural Heritage Resources
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	A referral letter dated July 11, 2018, for CP 408 development was sent to the appropriate individual(s) and/or group(s). Cooper Creek Cedar Ltd did not receive any comments from First Nations identifying any concerns with the proposed development that had the potential of impacting cultural heritage values.
Recreation Resources	
Result or Strategy Description	4.3 - Recreation
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	The proposed cutblock is not located within a designated Recreational Area or Trail with legal objectives; therefore, managing for Recreation Resources is not applicable.
Riparian Management	
Result or Strategy Description	3.4.1 - Objectives set by Government for Riparian Areas
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	1) There is one S4 class stream that flows outside the western harvest boundary, and two S6 class streams that flow within the cutblock. 2) See Section E.1 for Riparian Management Strategies. 3) See Section F for management strategies related to Temporary Access Structures and Soil Disturbance that should be used during and post-harvest in order to prevent/reduce soil disturbance and sediment delivery.
Soil Objectives	
Result or Strategy Description	3.1 - Objectives set by Government for Soils [FPPR Section 5 and 12.1(1)]
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	(FPPR Section 35 & 36) 1) SU A and B do not contain Sensitive soils, and soil disturbance will not exceed 10% . Specific measures for mitigating soil disturbance levels are addressed under Section F of this Site Plan. 2) Areas of the block where temporary access structures are required will be rehabilitated. 3) Specific rehabilitation measures are addressed under Section F of this Site Plan. 4) PAS will not exceed the recommended limit of 7.0% and is estimated at 4.9% . 5) Areas within the block assigned to roadside work areas will not exceed 25% .
Visual Objectives	
Result or Strategy Description	3.6 – Visual Quality
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	A Visual Impact Assessment for CP 408 was completed by Timberland Consultants Ltd in September, 2018. Portions of two cutblocks (blocks 5 and 7) fall within polygons with a VQO of Modification, and the remaining cutblocks fall within area that is Not Visually Sensitive. Analysis showed that blocks 5 and 7 were only partially visible to non-visible from Highway 31 viewpoints; therefore the proposed development of CP 408 meets the established VQO of Modification.
Water Management Objectives	
Result or Strategy Description	3.4.4 - Consumptive Use Streams
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	'KBHLP Objective 6' – Does not apply - Block 10 is located within the Meadow Creek Watershed. Meadow Creek and Matt Creek are located >600m to the West of the block. Matt Creek is a lower order stream that flows into Meadow Creek; therefore, the KBHLP streamside management zone does not apply. Meadow Creek has six domestic use PODs, the closest of which is >4.5km from block 10 . Referral letters were sent to Meadow Creek water users on August 22, 2018 and no comments or concerns were received. The distance between the block and PODs will help avoid or minimize disturbance to water quality.

Wildlife Objectives	
Result or Strategy Description	3.3.1 - Objectives set by Government for Wildlife - Species at Risk – Section 7 of the FPPR
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	The block is not within a Wildlife Habitat Area. There were no sightings of Species at Risk during field development of this cutblock.
Result or Strategy Description	3.5.2 - Objectives set by Government for Wildlife and Biodiversity – Stand Level
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	(FPPR Section 66 & 67) There are four Wildlife Tree Retention Areas planned for this block, totalling 4.9 ha . Overall wildlife tree retention percentage is approximately 11.4% . The WTRA % meets the minimum % requirements stated in the FSP.
Result or Strategy Description	3.3.2 – Ungulate Winter Range
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	Block 10 is outside designated Ungulate Winter Range.

ADDITIONAL COMMENTS

Consistency Statement
This block is consistent with the 2018 – 2023 Forest Stewardship Plan – Cooper Creek Cedar Ltd. Forest Licence A30171 , approved January 26, 2018. This Site Plan is prepared for CP 408 block 10 , in accordance with FRPA Section 10(1), (2) & (3).
Community Watersheds
FSP Section 3.4.3 Not applicable - the proposed block is not located within a Community Watershed.
Enhanced Resource Development Zones
FSP Section 3.2.1 'KBHLP Objective 7 – Enhanced Resource Development Zones – Timber' Block 10 is not within an Enhanced Resource Development Zone. The requirement to create a Result/Strategy for this objective does not apply.
Fire Maintained Ecosystems
FSP Section 3.5.3 'KBHLP Objective 8 – Fire maintained Ecosystems'. There are no NDT 4 ecosystems in the FDUs under this FSP, therefore the fire-maintained ecosystem objective is not applicable.
Fisheries Sensitive Watersheds
FSP Section 3.4.2 At the time the FSP was developed there were no designated "Fisheries Sensitive Watersheds" in FDUs in the FSP, therefore the requirement to create a Result/Strategy for this objective does not apply.
Invasive Plants
FSP Section 4.1 – Invasive Plants The IAPP website was checked on October 2, 2018. The following invasive species were reported in nearby areas to CP 408 ; Common tansy, Canada Thistle, Chicory, Hawkweed species, Oxeye Daisy, Orange Hawkweed, Spotted Knapweed, St. John's wort, Yellow Hawkweed, and Burdock species. Measures to prevent the introduction or spread of invasive plants noted in the FSP include: <ul style="list-style-type: none"> • Cleaning equipment before moving from a work site with existing infestations to a new work site. • Minimizing soil disturbance during primary forest activities (PFA). • Reseed exposed mineral soil, resulting from a PFA in the first available fall or spring within 12 months following the soil disturbance. Plan planting of cutblocks as soon after harvesting as possible. • During PFAs minimize soil disturbance by: <ul style="list-style-type: none"> - harvest on a snowpack, when feasible - random skid to designated skid trails to minimize skidder traffic on the ground - utilize benches for skid trails to minimize side cuts - utilize brush to construct skid trails to reduce contact with the ground - use overhead cable harvesting systems on steep ground • Where grass seeding is undertaken, CCC will use certified grass seed (Canada common #1 or better grade) from reputable suppliers to ensure premium quality free of invasive plant seed, or a seed mix recommended by a MFLRNO range specialist. • See FSP for additional strategies and practices regarding invasive plants.
Natural Range Barriers
FSP Section 4.2 Not applicable. There are no range tenures located in the FDUs covered by this FSP.
Timber
FSP Section 3.2 - Timber As per Sec 12(8) of the FPPR, results or strategies are not required for an objective set by government for timber.
Wildlife - Caribou
FSP Section 3.3 and 3.5.3 'KBHLP Objective 3 – Caribou' was cancelled and replaced by <i>GAR Order #U-14-012 – Mountain Caribou – Southwest Kootenay Planning Unit</i> . This block does not fall within a Caribou Management Zone.
Wildlife – Grizzly Bear Habitat - Connectivity
FSP Section 3.3 and 3.5.3 'KBHLP Objective 5 – Grizzly Bear Habitat & Connectivity Corridors'. Not applicable to the FDU which includes this block. Block 10 falls within Connectivity Corridor area. Applicable targets for Old and Mature forest will be met following harvest.

STOCKING REQUIREMENTS

SU	NAR	Standards ID #	Other Performance Standards
A	19.1	1057465	See Section H - Stocking Requirements
B	16.8	1057474	See Section H - Stocking Requirements

C. MANAGEMENT OBJECTIVES & STRATEGIES

C.1 MANAGEMENT OBJECTIVES

- Objectives for **CP 408 block 10** include meeting visual quality objectives, protecting streams, and retaining stand structure and forage values for wildlife.
- Harvest this mature stand of **Hw Cw Fd (Lw At)** for saw logs, chips and value-added products and manage for healthy, free growing stands of planted and natural **Fd Lw Cw Hw (Pw)** in SU A, and **Fd Lw Cw (Pw Py Pl Hw)** in SU B.
- Wildlife Tree Retention Areas (WTRA's):** Four patches are planned for retention, totaling **4.9 ha** in size.
- Kootenay Boundary Land Use Plan – Implementation Strategy (June 1997):** This block is located within **Resource Management Zone K-S08** (Lardeau, Cooper and Meadow Creeks – Special Resource Management Zone) and within the designated **Landscape Unit K17** (Goat Range) – High BEO Assignment.

C.2 CONDITIONS THAT MUST EXIST AFTER HARVEST OR TREATMENT TO ACCOMMODATE KNOWN FOREST RESOURCES

C.2a WILDLIFE

Stand Level attributes/ concerns identified:

Ungulate Winter Range: Block 10 is outside designated Ungulate Winter Range.

Slope values are low to moderate in SU A and B, with few steeper pitches. Lower to middle elevation ICH mw2 site conditions. Aspect ranges from SW – W - NW facing, with variable short and long broken slopes. Lower to middle slope location. Vegetation cover is very low to low over most of the unit. Existing coarse woody debris levels are Low (≤ 40 cm diameter) in most areas.

SU A and B: stand type is **Hw6Cw2Fd2(LwAt)**. Low densities of Cw Hw Fd Lw vets are present.

Average stand density (all species) is 692 stems/ha. Most stems fall within the 20-50cm DBH classes, with <5% of stems in the 55-150cm DBH classes. Approximate species densities are Hw 460 stems/ha, Cw 127 stems/ha, Fd 60 stems/ha, Lw 38 stems/ha, At 7 stems/ha. The understory contains moderate to high densities of Cw Hw regen, saplings and poles that are mostly suppressed and in poor condition, but saplings and regen growing in canopy openings are in good condition. There are also 145 stems/ha of dead stems mainly in the 20-50cm DBH classes.

Forest cover adjacent to the block includes immature stands in cutblocks harvested between 1977 and 2005 to the north and east, and mature stands to the west and south.

Actions prescribed:

Total Area specified for the retention of wildlife trees: **4.9 ha** (11.4% of gross area)

Wildlife Tree Retention Areas (WTRA's):

WTRA-1 (1.8 ha) Hw9Cw1: This WTRA is located in the Northeast area of the block at FC16 and contains a Hw leading stand. Density is 700 - 800 sph; Height range is 25 - 35m; DBH range is 30 - 55cm; Age class is 6 - 8. Crown closure is 50%. Hw and Cw vets are present along with few Hw snags; sloughing bark, cavities, and large branching patterns were noted. Moderate understory densities and steep slopes (50-80%) are present. Wildlife sign inside the patch included woodpecker excavations and wolf tracks.

WTRA-2 (1.4 ha) Fd4Cw3Hw2Lw1(Ep): This WTRA is located in the southern area of the block. Density is 600 sph; Height range is 21 – 30m; DBH range is 20 – 40cm; Age class is 6 - 8. Crown closure is 40%. Few Fd vets are present along with few Fd Ep snags. Other attributes include steep slopes, low CWD levels, low understory densities, and low vegetation cover (maple). An S6 stream runs through the north end of the patch. Wildlife sign included woodpecker excavations.

WTRA-3 (1.0) Hw4Fd3Cw3 : This WTRA is located on the west side of the block, upslope from FC5. Density is 700-900 sph; Height range is 21-30m; DBH range is 18 – 45cm; Age class is 6 - 8. Crown closure is 50%. Few Fd Cw vets are present along with few Fd Ep snags. Other attributes include steep slopes, dispersed surface rock, moderate CWD levels, and moderate understory densities. Wildlife sign included woodpecker excavations.

WTRA-4 (0.8 ha) Hw8Cw1Fd1: This WTRA is located along the eastern harvest boundary at FC15 and contains a similar stand to SUA. Density is 700 - 800 sph; Height range is 17 - 30m; DBH range is 30 - 45cm; Age class is 6 - 8. Crown closure is 65%. Moderate understory densities are present.

WTRA's will provide stand structure values for wildlife, perching and cover values, riparian values, and visual values. Coarse woody debris values will also be created over time from dead and fallen stems.

Snags

Retain safe snags <5m tall in **SU A** and **B** where operationally feasible. Snags with evidence of wildlife use are preferred.

C.2c FISHERIES

There is one **S4 class** stream that flows outside the western harvest boundary. This stream is connected to a small lake to the north. Approximately **85 - 90%** of the basal area will be retained within the **30m RMZ** in areas outside the block and in WTRA-3.

See Section E.1 for Riparian Management Strategies.

C.2d WATERSHEDS

See RESULTS AND STRATEGIES (3.4.4 - Consumptive Use Streams).

C.2e RECREATION

See RESULTS AND STRATEGIES (4.3 – Recreation).

C.2f BIOLOGICAL DIVERSITY

Landscape Unit - K17 (Goat Range): High BEO Assignment.

C.2g VISUAL RESOURCE MANAGEMENT
See RESULTS AND STRATEGIES (3.6 – Visual Quality).
C.2h CULTURAL HERITAGE
See RESULTS AND STRATEGIES (3.7 - Objectives set by Government for Cultural Heritage Resources).
See section E.5 for Archaeological information.
C.2i RANGE
Not applicable. There are no range tenures located in the FDUs covered by this FSP.
C.2j OTHER RESOURCES
Trapping / Guiding: Trappers or guiding license holders in the area will be identified and notified through the Forest Stewardship Planning process.
Windthrow: Windthrow hazard is Very Low for adjacent immature stands to the East and North where previous harvesting has occurred. Windthrow hazard is Moderate for adjacent mature stands to the West and South. Mature stands adjacent to SU A and B are similar to more open, with partial components of Lw and Fd (good rooting properties). Mature stands to the West rise above the harvest boundary on moderate slopes across an S4 draw. Adjacent mature stands close to previous harvesting have already been partially exposed to winds. The block is long, narrow, and irregular in shape with a lower slope location. Soils in SU A and B are moderately well to well drained. Rooting depth is 25 – 35cm.
CONDITIONS NOT APPLICABLE TO THIS SITE PLAN
THE FOLLOWING CONDITIONS WERE CONSIDERED, AND FOUND NOT TO BE APPLICABLE TO THIS SITE PLAN: None identified.

D. ECOLOGICAL INFORMATION AND SITE CHARACTERISTICS

D.1 STANDARDS UNITS AND CRITICAL SITE CONDITIONS						
SU	TREATMENT UNIT	ZONE	BIOGEOCLIMATIC			SITE TYPE
			SUBZONE	VARIANT & PHASE	SITE SERIES	
A	1	ICH	mw	2	101 ⁷ 104 ² 110 ¹	-
B	1	ICH	mw	2	104 ⁹ 101 ¹	-

E. MANAGEMENT STRATEGIES

E.1 RIPARIAN MANAGEMENT STRATEGIES				
RIPARIAN RESERVE ZONE (RRZ)				
RIPARIAN/ LAKE ID	RIPARIAN/ LAKE CLASS	HARVESTING Y/N	SU XREF	DESCRIPTION OF THE PURPOSE AND EXTENT OF REMOVAL OR MODIFICATION OF TREES AND ANY RELATED FOREST PRACTICES IN RIPARIAN RESERVE ZONE(S)
N/A	-	-	-	-
RIPARIAN MANAGEMENT ZONE (RMZ)				
RIPARIAN/ LAKE ID	HARVESTING Y/N	SU XREF	MANAGEMENT STRATEGIES FOR RIPARIAN OR LAKESHORE MANAGEMENT AREAS INCLUDING PROTECTING STREAM BANKS (if there is no RRZ), MAINTAINING SHADE, AND DEBRIS MANAGEMENT. IF FELLING AND/OR YARDING ACROSS STREAMS. INCLUDE EITHER THE RESIDUAL BASAL AREA OR DENSITY FOR RMZ (S) AND LMZ (S).	
S4-10-1	Y	A, B, WTRA-3	<p>30m RMZ: 85 - 90% of the basal area will be retained within the 30m RMZ in areas outside the block and in WTRA-3. Portions of the 30m RMZ that fall within the block will be harvested as per SU A and B. Channel has been marked in the field with red ribbon.</p> <p>Portions of Spur 1-10 fall within the RMZ because there is no other practicable option for locating the road to access the southern part of the block. Road maintenance activities must not be carried out beyond the clearing width of the road. Gravel or other fill must not be removed from the RMZ in the process of constructing, maintaining or deactivating the road, unless the gravel or fill is within the road prism, or there is no other practicable option. (FPPR 50)</p> <p>(See additional management strategies below)</p>	
S6-10-1	Y	A, B, WTRA-2	<p>20m RMZ: 1 - 10% of the basal area will be retained within the 20m RMZ in areas outside the block and in WTRA-2. Portions of the 20m RMZ that fall within the block will be harvested as per SU A and B. Channel has been marked in the field with red ribbon.</p> <p>Portions of Spur 1-10 fall within the RMZ because the road is required as part of a stream crossing. Road maintenance activities must not be carried out beyond the clearing width of the road, except as necessary to maintain the stream crossing. Gravel or other fill must not be removed from the RMZ in the process of constructing, maintaining or deactivating the road, unless the gravel or fill is within the road prism, at the stream crossing, or there is no other practicable option. (FPPR 50)</p> <p>(See additional management strategies below)</p>	
S6-10-2	Y	B	<p>20m RMZ: ≥0 - 1% of the basal area will be retained within the 20m RMZ in SU B. Portions of the 20m RMZ that fall within the block will be harvested as per SU B. Channel has been marked in the field with red ribbon.</p> <p>(See additional management strategies below)</p>	
NON-CLASSIFIED (NC) RIPARIAN AREAS				
RIPARIAN/ LAKE ID	SU XREF	MANAGEMENT STRATEGIES		
NCD-10-2,4	B	Two NCD channels are present within SU B at the south end of the block. NCD-10-4 is a branch of NCD-10-2. NCD-10-2 changes to stream S6-10-2 further upslope. NCD channels have been marked in the field with red ribbon. (See management strategies below)		
Riparian Assessment was completed by Timberland in September 2018 .				
<ol style="list-style-type: none"> S4-10-1 stream – stream had moderate flow, average channel width of 0.8m, and average gradient of 0 - 5% with a meandering channel located in a draw outside the western block boundary. Stream connects to a small lake to the North. S6-10-1 stream – stream had moderate flow, average channel width of 0.5m, and average gradient of 26%. Stream originates on upper slopes within the south central area of the block and separates into two channels before exiting the lower boundary. A short section of the stream passes through WTRA-2. S6-10-2 stream – stream had moderate flow, average channel width of 0.4m, and average gradient of 23%. Stream enters the upper boundary on the south side of the block and runs for approximately 90m before transitioning into NCD-10-2. Observe a 5m Machine Free Zone (MFZ) on the S6 streams and NCD channels, except at designated road and skid crossings. Reserve non-merchantable understory stems <17.5cm DBH and shrubs within the 5m MFZ, where practicable. Fall and skid timber away from riparian features (streams, NCD's, wetland) where practicable. Any debris entering a riparian feature as a result of harvesting will be removed upon completion of harvesting activities unless it does not obstruct water flow or its removal would cause further damage to the riparian feature. Minimize crossings on watercourse channels to the extent possible. Where watercourses are crossed more than once, it is recommended to place a temporary skid bridge (e.g.: logs placed in draw) in order to prevent a potential diversion of flow. All machine trails and crossings should be fully rehabilitated upon the completion of harvesting. Excess material that could cause redirection of natural drainage patterns should not be left at crossing locations. All surface drainage patterns should be maintained and any that are disrupted as a result of harvesting operations should be restored immediately. A post-harvest inspection should be completed to assess the amount of logging debris/excess soil within the wetted perimeter of all subtle drainage features. All natural drainage patterns should be maintained and left free of excess debris (slash or soil) that could result in a redirection of seasonal surface runoff/drainage diversion. Basal area retention levels for the in-block RMZ's (within the NAR) are based on windthrow, windfirmness, wildlife habitat, water quality, and operational constraints. 				

E.2 FOREST HEALTH MANAGEMENT STRATEGIES					
SU	Code	Nelson Region DRA Risk Factors	Points	Relative Risk	Comments
A, B	DRA	Site factors Host factors Inoculum potential Disease factors	8 4 0 8-10	H M L L-M	<ul style="list-style-type: none"> • Armillaria is present at low levels in this stand, noted in low incidence in Fd snags within and outside harvest boundary ($\leq 5\%$ incidence). • The Nomographic Zones in Section 3.0 of the "Armillaria Root Disease Management Guidelines for the Nelson Forest Region" (June 1998) indicate that Alternative or Intensive deferred treatments for root disease management are appropriate for this site, should Armillaria become a problem. • Alternative treatments will include planting (and/or managing for) a species mixture that includes species tolerant and /or moderately susceptible to Armillaria (e.g.: Lw, Cw, Hw, Pw in SU A; Lw, Cw, Hw, Pw, Py, PI in SU B). Fd and Sx (highly susceptible) may be included in the planting mixture but should be limited to a combined maximum of 50% of the mix. Microsite selection should reflect buffer zones around infected stumps, if they can be identified. • Hand-pulling (preferred) or pop-up spacing (alternative) should be considered in the future should Armillaria become a limiting factor in meeting regeneration or free growing requirements (see section H). • Stumping or pushover harvesting treatments are not suitable due to low sign of Armillaria and high soil hazards.
			20-22	M	
Other Forest Health Factors					
SU	Code	%	Comments		Current risk to inventory
A, B	IWS	0	If Sx is planted in the post-harvest stand, monitor for white pine (spruce) weevil during silviculture surveys.		nil
A, B	DML	<5	Lw forms 6% of the current stand density and 4% of the current stand volume. Mistletoe was noted in snags and some live individuals throughout and outside block boundaries.		nil
A, B	IBD	0	Fd forms approximately 9% of the current stand density and 14% of the current stand volume. (DBH range 30 - 55cm).		Low
A, B	DSB	0	Pw is absent or present in minor amounts in the current stand. A small amount of Pw may be planted. Plant only rust resistant stock. Expect high incidence of white pine blister rust on any naturally regenerated Pw.		nil
Expected future risks and actions (next page)					
<p>A FOREST HEALTH/PEST INCIDENCE ASSESSMENT IS NOT REQUIRED. Forest health information was collected during SP field data collection in September 2018.</p> <p>Future risks include seedling drought mortality and stress during summer months. Lower elevation ICH mw2 site conditions, warm aspect.</p> <p>SU A and B: Average species composition of the pre-harvest stand (stand density) is approximately Hw 66% Cw 18% Fd 9% Lw 6% At 1%. Low densities of Cw Hw Fd Lw vets are present.</p> <p>The age of mature trees in the stand, based on ages taken during cruising, is 83 - 163 years (average 123 years).</p>					

E.3 VEGETATION MANAGEMENT STRATEGIES	
LIVESTOCK TO BE USED FOR VEGETATION MANAGEMENT: YES: <input type="checkbox"/> NO: <input checked="" type="checkbox"/>	
Current Brush Hazard:	
SU A & B: Very Low to Low levels of brush, with few areas of Moderate cover. Higher brush cover noted in adjacent older cutblocks.	
Future Brush Hazard:	
SU A & B: Future hazard is Moderate to High due to submesic to mesic moisture conditions and adjacent brush sources. Potential competitor species include alder, maple, birch, aspen, thimbleberry, and bracken fern. Birch and maple noted as major components of adjacent immature stands. Consistent Ep snags throughout.	
Species Complex:	
SU A: Current vegetation includes western yew, huckleberry, Utah honeysuckle, falsebox, prince's pine, rattlesnake plantain, queens cup, and minor foamflower, oak fern, and devils club.	
SU B: Current vegetation includes western yew, falsebox, Utah honeysuckle, huckleberry, prince's pine, rattlesnake plantain, queens cup and rose spp.	
Brushing Methods: Should brushing become necessary, manual treatments are the preferred methods.	
Anticipated Timing/Constraints: Treatment needs will be assessed through periodic walkthroughs and silviculture surveys. Treatment timing will be prescribed at the time of brush assessment.	
Note: Where possible, avoid brushing Vaccinium spp in order to maintain huckleberry picking values, and to maintain forage on site for grizzly and black bears.	
E.4 COARSE WOODY DEBRIS (CWD) MANAGEMENT STRATEGIES	
CWD levels are mainly Very Low to Low in most areas with $\leq 10\%$ ground cover. Few areas of up to 25% ground cover and minor blowdown. CWD is predominantly composed of 15 - 40cm diameter stems of Lw Ep (Fd Cw Pw Hw). Most stems are older with no bark or losing bark.	
CWD levels are expected to be Low to Moderate post-harvest. Post-harvest CWD will consist of unmerchantable existing levels and snags (Lw Ep), along with residue and breakage. A reduction of CWD levels is anticipated through clean harvesting practices and/or site preparation for planting, if required.	
(FPPR Section 68): Retain a minimum of 4 logs per hectare , each being at least 2 metres in length and at least 7.5cm in diameter at one end. See the SITE PREP section (K.1) for CWD management strategies.	

E.5 ARCHAEOLOGICAL IMPACT ASSESSMENT

Archaeological Overview Mapping of the CP 408 area shows that block 10 does not fall within a polygon that has a potential rating. An Archaeological Impact Assessment is not required.

F. SOIL CONSERVATION

F.1 SITE DISTURBANCE

SU	HAZARD RATINGS			SOIL CHARACTERISTICS		
	SOIL COMPACTION	SOIL DISPLACEMENT	SURFACE SOIL EROSION	DEPTH TO UNFAVOURABLE SUBSOIL (cm)		TYPE OF UNFAVOURABLE SUBSOIL
				MIN(cm)	MAX(cm)	
A	High	Moderate	High	60	60	Fragmental (>70% CF) at 60cm
B	High	Moderate	High	60	60	N/A

F.2 SOIL DISTURBANCE LIMITS

SU A: ARE THERE SENSITIVE SOILS? YES NO

SU B: ARE THERE SENSITIVE SOILS? YES NO

MAX. PROPORTION OF TOTAL AREA UNDER THE PRESCRIPTION ALLOWED FOR PERMANENT ACCESS STRUCTURES (PAS): **4.9%**

Roadside harvesting or temporary landings will be used.

DEACTIVATION OF PERMANENT ACCESS STRUCTURES: Any permanent access structures (e.g.: roads, landings) will be deactivated – debris will be piled & burned, water control will be installed around all landings.

SU	MAXIMUM ALLOWABLE SOIL DISTURBANCE WITHIN THE NET AREA TO REFOREST (%)	MAXIMUM EXTENT SOIL DISTURBANCE LIMITS MAY BE TEMPORARILY EXCEEDED TO CONSTRUCT TEMPORARY ACCESS STRUCTURES OR EXCAVATED OR BLADED TRAILS (%)
A	10%	5%
B	10%	5%

MASD for Roadside Work Areas: 25%

Any temporary access structures (e.g.: road, landing, excavated or bladed trails) will be rehabilitated to the extent necessary to bring the SU net area back into compliance with the specified soil disturbance limits.

See Section F.4 below for description of temporary access structures and/or excavated or bladed trails, if any.

Avoid harvesting during spring freshet/breakup conditions when soils are saturated, in order to reduce soil displacement and compaction.

Few areas of **steep slopes >35%** are present in parts of SU A, and B, and are noted on the **Harvest Plan map**.

F.3 REHABILITATION TIME FOR TEMPORARY ACCESS STRUCTURES

MAXIMUM ALLOWABLE TIME TO COMPLETE REHAB (MEASURED FROM COMPLETION OF HARVEST): **1 YEAR**

F.4 MANAGEMENT STRATEGIES FOR TEMPORARY ACCESS STRUCTURES

SU	GENERAL LOCATION:	MAX ALLOWABLE HEIGHT OF CUTBANKS (m)	AVERAGE HEIGHT OF CUTBANKS (m)	EQUIPMENT TO BE USED (IF OTHER THAN EXCAVATOR)
A, B	Blading or excavating is expected to occur in parts of the unit with moderate to steep slopes.	0.8	0.3	Skidder, cat.

Temporary Landings:

SU A: 2 landings @ 0.2 ha = 0.4 ha

SU B: 2 landings @ 0.2 ha = 0.4 ha

- **SU A & B: Roadside harvest with landings. Favorable skidding with minor adverse skidding.**
- **If broadcast burn treatment is anticipated, disperse non-merchantable woody debris and slash on site during harvest to enhance fuel levels.**
- **See Section E.1 for riparian management strategies.**

The following will apply for any excavated/bladed trails that are required:

- Maximum trail width is 4m.
- Actual dimensions of bladed trails may vary depending on topography.
- The amount of bladed trail constructed will be kept to a minimum.

Short sections that become bladed trails where a non-bladed trail crosses a hump or ridge will be exempt from rehabilitation requirements provided that the soil disturbance limits in this SP are not exceeded.

Rehabilitation for bladed or excavated trails:

Any bladed or excavated trails will be rehabilitated as follows:

- De-compact the trail, including removing or redistributing woody debris that is concentrating subsurface moisture
- Return displaced surface soils, retrievable side-cast and berm materials on the excavated portion of the area
- Re-contour the slope
- Re-establish natural surface drainage
- If soil erosion may cause sediment to enter a stream or wetland, place some woody debris over exposed mineral soils, and revegetate exposed mineral soils.

G. SILVICULTURAL SYSTEMS

SILVICULTURAL SYSTEMS	
SU	SYSTEM / VARIANT / PHASE
A, B	Clear-cut silviculture system.
SU	STAND STRUCTURE AND SITE CONDITION - COMMENTS
A, B	<p>Post-harvest stand structure will be even-aged with one age class.</p> <p>Planted trees and natural regeneration will include Fd Lw Cw Hw (Pw Sx BI) in SU A, and Fd Lw Cw (Hw Pw Py PI Sx) in SU B.</p> <p>Wildlife Tree Reserve Areas (WTRA's): 4.9 ha</p> <p>Leave trees</p> <p>No mature leave trees are planned in SU A or B.</p> <p>Snags</p> <p>Retain safe snags <5m tall in SU A and B where operationally feasible. Snags with evidence of wildlife use are preferred.</p>

H. STOCKING REQUIREMENTS (as per DSE South Columbia Default Stocking Standards Version 1.0, April 1, 2018)

H.1 ADMINISTRATION INFO and ASSESSMENT DATES								
SU Regime #	SU A – 1057465 SU B - 1057474		FREE GROWING ASSESSMENT PERIOD (years)					
Name:	SU A - ICH mw2 101 SU B – ICH mw2 104							
SU	REGENERATION DATE (YEARS)		EARLY		LATE			
A	4		9		20			
B	7		12		20			
H.2 STOCKING REQUIREMENTS FOR SILVICULTURAL SYSTEMS OTHER THAN SINGLE TREE SELECTION								
SU	PREFERRED SPECIES		ACCEPTABLE SPECIES		POST SPACING DENSITY (stems/ha)		MAX CONIFEROUS (stems/ha)	
	SPECIES	MINIMUM HEIGHT (m)	SPECIES	MINIMUM HEIGHT (m)	MAX	MIN		
A	Fd ⁵⁸ Lw Cw Hw ²⁰¹ Pw ³¹	Lw Pw – 2.0 Fd – 1.4 Cw Hw – 1.0	BI ^{10,13,500} Sx ^{10,13}	BI Sx – 1.0	1800	700	10,000	
B	Cw ^{10,201} Fd ⁵⁸ Lw Pw ³¹	Lw Pw – 2.0 Fd – 1.4 Cw – 1.0	PI Hw Py ^{9,14,203} Sx ^{10,13}	PI – 2.0 Hw Py Sx – 1.0	1800	700	10,000	
SU	WELL SPACED TREES/ha				MINIMUM PRUNING HEIGHT <i>(delete if not applicable)</i>	RESIDUAL STAND STRUCTURE (other than single tree selection)		HEIGHT RELATIVE TO COMPETITION (% Tree over brush)
	TARGET pa	MIN pa	MIN p	MIN inter-tree DISTANCE		BA (m ² /ha)	DENSITY (SPH)	
A	1200	700	600	2.0 *	-	-	-	150%
B	1200	700	600	2.0 *	-	-	-	150%

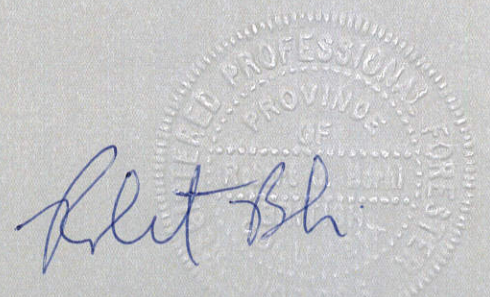
Footnotes

9	Suitable on warm aspects.
10	Suitable on cool aspects.
13	Suitable at upper elevations.
14	Suitable at lower elevations.
31	Must use of blister rust resistant stock. See BC Journal of Ecosystems and Management 10(1):97-100 for supplementary information.
58	South Area – Fd limited to a max 50% of preferred and acceptable well-spaced stems due to root rot. See Root Rot Handbook (2017, in press).
201	Maximum 50% of preferred and acceptable well-spaced trees.
203	Recommended on sites for climate change adaptation.
500	DSE: Advance BI regen: <1.5 m tall at time of harvest, >75% live crown, >10cm leader, no scars, forks, crooks, or sweeps, and Apical dominance >1 as measured by comparing ratio of leader height to length of most recent branch.
*	MITD: For site series that <u>do not already have reduced MSS</u> , a reduced mitd of 1.7m may be used to facilitate planting superior microsites, when sites have: mechanical site preparation (mounding & disk trenching), been previously fill planted, or conditions where obstacle planting for snow creep is necessary. Reduced MITD applies to PLANTED TREES ONLY.

This block is located at lower to middle elevations of the ICH mw2 biogeoclimatic unit. Aspect is predominantly West.
Py is potentially an acceptable species for planting in SU B based on aspect and elevation.

See Section K for planting stock recommendations.

I. ADMINISTRATION

SITE PLAN PREPARED BY (RPF SIGNATURE AND SEAL):	
<p>Robert Borhi <hr/> RPF Name (Printed)</p> <p>Date: <u>10/12/2018</u> RPF #: <u>3026</u></p>	 <hr/> RPF Signature and Seal
SITE PLAN ATTACHMENTS:	MAJOR LICENSEE SIGNING AUTHORITY:
<input checked="" type="checkbox"/> SP MAP(S) <input type="checkbox"/> ARCHAEOLOGICAL IMPACT ASSESSMENT <input checked="" type="checkbox"/> TERRAIN STABILITY FIELD ASSESSMENT <input checked="" type="checkbox"/> VISUAL IMPACT ASSESSMENT <input type="checkbox"/> RIPARIAN ASSESSMENT <input type="checkbox"/> FOREST HEALTH / PEST INCIDENCE ASSESSMENT <input checked="" type="checkbox"/> SOIL CONSERVATION TABLE <input checked="" type="checkbox"/> OTHER: <u>REFORESTATION PRESCRIPTION</u> <input checked="" type="checkbox"/> OTHER: <u>ARMILLARIA RISK ASSESSMENT MATRIX</u>	<hr/> Licence Holder Signing Authority Signature <hr/> Licence Holder Signing Authority Name (Printed) Date: _____

	Standards Units				TOTAL HA	%
	A	B				
HAZARD RATINGS:						
Compaction	High	High				
Soil Displacement	Moderate (14)	Moderate (10-12)				
Surface Erosion	High (29)	High (27-29)				
Forest Floor Displacement	High (17)	High (17 - 23)				
Mass Wasting	Moderate (36)	Moderate (33-36)				
Harvest System	Ground based	Ground based				
TOTAL AREA	25.9	17.0			42.9	
Wildlife Tree Patches / NP Nat						% WTP/IMM
WTRA	4.9	-			4.9	11.4
NP brush	-	-			-	-
Permanent Access Structures						% Disturbance
Proposed roads	1.9	0.2			2.1	4.9
Existing roads	0	0			0	0
Landings	0	0			0	0
Total disturbance permanent access structures	1.9	0.2			2.1	4.9
NET AREA TO BE REFORESTED	19.1	16.8			35.9	
Sensitive Soils (Y/N)	No	No				
Temporary Access Structures: Road, landing, excavated or bladed trails that will be rehabilitated (% of NAR).	5% (excavated/bladed trails, landings)	5% (excavated/bladed trails, landings)				
Max. Allowable dispersed Soil Disturbance (% of NAR by Standards Unit) as a result of harvesting, mechanical site preparation, or hazard abatement activities.	10%	10%				
Comments:						
Existing road (permanent access): N/A						
Proposed roads (permanent access):						
SU A: Spur 1-10: 1713m x 10m = 1.71 ha						
Spur 1-B: 216m x 10m = 0.22 ha						
SU B: Spur 1-10: 163m x 10m = 0.16 ha						
Spur 1-B: 54mx 10m = 0.05 ha						
Proposed Landings (temporary):						
SU A: 2 landings @ 0.2 ha = 0.4 ha						
SU B: 2 landings @ 0.2 ha = 0.4 ha						
See Section F for Soil Conservation and Management of Temporary Access Structures.						

R

K.1 SITE PREP					
SU	PREFERRED			ALTERNATE	
A, B	<ul style="list-style-type: none"> - Pile, or pile and burn, slash accumulations on roadsides and landings, or within the NAR. - Piling treatment during dry weather conditions or when soils not saturated. - Burn piles in the spring or fall. Up to 20% of piles may be left unburned to contribute to wildlife habitat and coarse woody debris values. 			<ul style="list-style-type: none"> - No site prep, plant as is. - * Mechanical site preparation (e.g.: mounding, scarification) where necessary and feasible, combined with brush/slash piling, utilizing an excavator. - ** Broadcast burn or Spot burn if needed within the NAR to reduce excessive slash cover. Low to Moderate intensity burn, impact rank 2 to 3. 	
<p>* SU A: Mechanical site preparation (such as mounding) could be considered, however there are no significant wet areas in this unit.</p> <p>** Broadcast burn or Spot burn is a good option to reduce slash levels prior to planting.</p>					
<p>Site Limiting Factors include:</p> <p>Moderately Well to Well drained soils. Mesic (SU A) to Submesic (SU B) soil moisture.</p> <p>Few areas of 35 - 60% slopes in parts of SU A. Isolated slopes of up to 80% in SU B.</p> <p>Low existing CWD levels. Lower elevation ICH mw2 location.</p> <p>Low to moderate slash hazard expected from snags, breakage, non-merch and fine slash. If burn treatment is anticipated, retain woody debris and slash on site during harvest.</p> <p>For machine use, avoid or minimize crossings on watercourse channels to the extent possible.</p> <p>Note: A decision on whether or not Site Preparation is needed will be made during a Post-Harvest assessment. If needed, the type of Site Preparation and portion(s) of the block needing treatment will be determined at that time.</p>					
K.2 PLANTING / SEEDLING REQUIREMENTS					
STOCK					SEASON
SU	SPECIES	AGE	TYPE	CNTR	
A	Fd Lw Cw (Pw)	1+0	PSB	410 / 412A	May / June
B	Fd Lw Cw (Pw PI Py)	1+0	PSB	410 / 412A	May / June
A, B	<ol style="list-style-type: none"> 1) Manage for a mixed species stand of preferred and acceptable species to the extent possible. 2) Refer to stocking standards (Section H.2) for footnote comments on elevation, aspect, or other limitations. 3) Target Cw to moister areas and depressions. 4) On dryer (west to southwest facing) sites, increase Fd and Lw and in the planting mixture (also PI and Py in SU B). 5) Recommend Fd to account for ≤ 50% of planting stock due to root disease potential (as per stocking standards). 6) On steeper slopes, plant trees on the uphill or downhill side of stumps to help minimize snow creep and snow press. 7) Expect low to moderate levels of Hw Cw Fd Lw natural regeneration. 8) Plant as soon as possible after harvest or site preparation. NOTE: A Post Harvest assessment will be completed to determine if site preparation is needed prior to planting. If site preparation is needed, the assessment will help to determine what method will be most effective. 9) In moist or wet areas, target trees to elevated microsites. 10) Monitor for signs of ungulate browsing during silviculture surveys. 				
K.3 BRUSHING					
SU	PREFERRED			ALTERNATE	
A, B	- Manual brushing with hand tools or power saws.			- None	
<p>Current Brush Hazard:</p> <p>SU A & B: Very Low to Low levels of brush, with few areas of Moderate cover. Higher brush cover noted in adjacent older cutblocks.</p> <p>SU A: Current vegetation includes western yew, huckleberry, Utah honeysuckle, falsebox, prince's pine, rattlesnake plantain, queens cup, and minor foamflower, oak fern, and devils club.</p> <p>SU B: Current vegetation includes western yew, falsebox, Utah honeysuckle, huckleberry, prince's pine, rattlesnake plantain, queens cup and rose spp.</p> <p>Future Brush Hazard:</p> <p>SU A & B: Future hazard is Moderate to High due to submesic to mesic moisture conditions and adjacent brush sources.</p> <p>Competitor species: Potential competitor species include alder, maple, birch, aspen, thimbleberry, and bracken fern. Birch and maple noted as major components of adjacent immature stands. Consistent Ep snags throughout.</p> <p>Anticipated Timing/Constraints: Treatment needs will be assessed through periodic walkthroughs and silviculture surveys. Treatment timing will be prescribed at the time of brush assessment.</p> <p>Note: Where possible, avoid brushing Vaccinium spp in order to maintain huckleberry picking values, and to maintain forage on site for grizzly and black bears.</p>					

R