

SITE PLAN CP 413 BLOCK 1 COOPER CREEK CEDAR LTD.

A. TENURE IDENTIFICATION

LICENCE NO.: FL A30171	CP: 413	BLOCK: 1	TIMBER MARK: FE5413	UTM: 504975 E, 5502250 N	LICENSEE NAME: Cooper Creek Cedar Ltd.
AREA UNDER TENURE (ha): 32.2	MAPSHEET/OPENING #: 82F066	ELEVATION: 730-870m	LOCATION: Queens Bay		

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	TOTAL NPR AREA
2.8	-	-	-	-	-	2.7	-	-	5.5
NET AREA TO BE REFORESTED (ha)									
SU	SU AREA DESCRIPTION								NET AREA TO BE REFORESTED:
	The block is located in the Coffee South Face Domestic Watershed north of the community of Queens Bay.								
	ICH dw1 101₇ 104₃								
A	<p>Aspect is mainly southeast facing, slopes range from 5 to 30% with an average of 18%. Surface soil texture is Silty Loam (SiL), and subsoil texture is Sandy Loam to Silty Clay Loam (SL-SiCL). Soils are moderately well drained. Coarse fragment content is Low to Moderate (20-60%). Moisture regime is mesic to submesic and nutrient regime is poor to medium. Humus form is a mor (4.5-8.0cm thickness) and rooting depth is 29-40cm. Soils are non-sensitive.</p> <p>Average stand density (all species) is 382 stems/ha. Most stems fall within the 20-65cm DBH classes. Approximate species composition by density is Cw 54%, Hw 27%, Fdi 12%, Lw 4%, Bg 2% and Ep 1%. Stand age ranges from 48-127 with an average of 88 years old. The understory contains low densities of Hw, Bg, Lw and Cw regen, saplings and poles that are in fair to good condition.</p> <p>TU 1= 2.9 ha: Conventional Ground Based harvest methods and a Retention silviculture system. Retain 20-25 stems/ha as per section G (Silvicultural Systems).</p> <p>TU 2= 7.6 ha: Cable harvest methods and a Retention silviculture system. Retain 20-25 stems/ha as per section G (Silvicultural Systems).</p> <p>TU 3= 5.6 ha: Conventional Ground Based harvest methods and a Retention silviculture system. Retain 20-25 stems/ha as per section G (Silvicultural Systems).</p>								16.1
B	<p>ICH dw1 104₈ 101₂</p> <p>Aspect is variable, mainly southeast facing; slopes range from 5 to 55% with an average of 30%. Surface soil texture is Sandy Loam (SL), and subsoil texture is Loam (L). Soils are moderately well drained. Coarse fragment content is Moderate (40-55%). Moisture regime is mesic to submesic and nutrient regime is poor to medium. Humus form is a mor (8cm thickness) and rooting depth is 32cm. Soils are non-sensitive.</p> <p>Average stand density (all species) is 396 stems/ha. Approximate species composition by density is Cw 73%, Fdi 21%, Lw 5%, Hw 1% and Ep 1%. Cw fall in the 20-40cm DBH classes while Fdi and Lw fall in the 30-75cm DBH classes. Understory contains varying densities of Bg, Hw, Lw, Fdi and Cw regen in good condition where growing in openings created by past harvesting.</p> <p>Conventional Ground Based harvest methods and a Retention silviculture system with reserves. Retain 65 stems/ha, where available, as per section G (Silvicultural Systems).</p>								10.6
TOTAL NET AREA TO BE REFORESTED:									26.7
TOTAL AREA UNDER THE PLAN:									32.2

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%	8.7
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 risk of soil compaction. Utilize designated harvesting trails, 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' Field data collection found this block to be ICH dw1, and the block lies within Connectivity Corridor. Landscape Unit K12: Kaslo River. For the ICH dw1, there is a Mature + Old forest requirement in this landscape unit. Analysis completed by Timberland shows that post-harvest there will be a surplus of Mature + Old within the Landscape Unit ICH dw1 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 Wildlife and Biodiversity – Landscape Level
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 complies with Sections 64 and 65 of the FPPR. Adjacent existing cutblocks are consistent with FPPR Section 65.
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 January 22, 2019, was sent to the appropriate individual(s) and/or group(s). No modifications to development were implemented as a results of the First Nations engagement process.
Recreation Resources	
Result or Strategy Description	4.3 - Recreation Sites
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 Fish, Water, Wildlife & Biodiversity in Riparian Areas
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	1) Madden Creek (NCD) runs through WTRA-1 and outside the eastern harvest boundary. 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)	1) SU A and B contain non-sensitive soils and soil disturbance will not exceed 10% . Specific measures for mitigating soil disturbance levels are addressed in Section F of this Site Plan. 2) Areas of the block where temporary access structures are required will be rehabilitated. Specific rehabilitation measures are addressed under Section F of this Site Plan. 3) PAS will exceed the recommended limit of 7.0% and is estimated at 8.7% . This is due to the existing mainline road structure running through the length of the block. 4) 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)	CP 413 falls partially within a polygon with a PR objective. A Visual Impact Assessment was completed by Timberland Consultants in March 2019, and the proposed blocks meet the definition and requirements of PR. Irregular shaped boundaries that follow natural terrain features, and large reserve areas serve to improve visual quality from viewpoints. A target of 20-25 stems/ha of mature retention in SU A and 65 stems/ha of mature retention throughout SU B will enhance visual quality. The proposed development of CP413 meets the established VQO of PR from the selected viewpoints.

Water Management Objectives	
Result or Strategy Description	3.4.4 - Consumptive Use Streams
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p>'KBHLP Objective 6' – CP413 Block 1 is located within the Coffee South Face Domestic Watershed.</p> <p>Referral letters dated November 9, 2019 were sent to POD licensees with a 30 day response period.</p> <p>Madden Creek (NCD) has 3 active PODs licensed for domestic purposes two of which are located downstream of this block. Full timber reserves have been placed on the drainage adjacent to block 1.</p> <p>See Section <i>E.1: Riparian Management Strategies</i> for more information.</p>
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)	<p>The block is not within a Wildlife Habitat Area.</p> <p>There were no sightings of Species at Risk during field development of this cutblock.</p>
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)	<p>One external Wildlife Tree Retention Area is planned for this block, totalling 2.7 ha. Overall wildlife tree retention percentage for block 1 is approximately 8.4%. Total WTRA for CP413 is 7.0 ha which constitutes approximately 11.9% of the gross area of the permit.</p> <p>The WTRA area meets the minimum percent requirements stated in the FSP for each block (3.5%) and for the whole cutting permit (7%).</p>
Result or Strategy Description	3.3.2 - Ungulates
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p>CP 413 (Block 1 and 2) overlaps two ungulate winter range management units with specific requirements for forage and snow interception. Analysis completed by Timberland Consultants Ltd., August 7, 2020, shows post-harvest applicable targets will be met.</p>

ADDITIONAL COMMENTS

Consistency Statement
<p>This block is consistent with the approved 2018 to 2023 Forest Stewardship Plan for Cooper Creek Cedar Ltd – Forest Licence A30171. This Site Plan is prepared for FL A30171 CP 413 Block 1, in accordance with FRPA Section 10(1), (2) & (3).</p>
Community Watersheds
<p>FSP Section 3.4.3</p> <p>Not applicable - The proposed block is not located within a Community Watershed.</p>
Enhanced Resource Development Zones
<p>FSP Section 3.2.1</p> <p>'KBHLP Objective 7 – Enhanced Resource Development Zones – Timber'</p> <p>Block 1 is not within an Enhanced Resource Development Zone.</p>
Fire Maintained Ecosystems
<p>FSP Section 3.5.3</p> <p>'KBHLP Objective 8 – Fire maintained Ecosystems'. There are no NDT 4 ecosystems in the FDUs under this FSP, therefore the requirement to create a Result/Strategy for this objective does not apply.</p>
Fisheries Sensitive Watersheds
<p>FSP Section 3.4.2</p> <p>At the time the FSP was developed there were no designated "Fisheries Sensitive Watersheds" in FDUs under this FSP, therefore the requirement to create a Result/Strategy for this objective does not apply.</p>

<p>Invasive Plants</p> <p>FSP Section 4.1 – Invasive Plants</p> <p>The IAPP website was checked on January 31, 2019. The following invasive species were reported in nearby areas to CP 413 (Queens Bay): Canada thistle, Chicory, Common tansy, Oxeye daisy, Himalayan blackberry, Japanese knotweed, Scotch broom, Spotted knapweed, Yellow hawkweed, Orange hawkweed, St. John's wort, Bladder campion, and Burdock species.</p> <p>Measures to prevent the introduction or spread of invasive plants noted in the FSP include:</p> <ul style="list-style-type: none"> • Cleaning equipment before moving from a worksite 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 MFLNRO range specialist. • See FSP for additional strategies and practices regarding invasive plants.
<p>Natural Range Barriers</p> <p>FSP Section – 4.2</p> <p>Not applicable. There are no range tenures located in the FDUs covered by this FSP.</p>
<p>Timber</p> <p>FSP Section 3.2 - Timber</p> <p>As per Sec 12(8) of the FPPR, results or strategies are not required for an objective set by government for timber.</p>
<p>Wildlife - Caribou</p> <p>FSP Section – 3.3 and 3.5.3</p> <p>'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.</p>
<p>Wildlife – Grizzly Bear Habitat - Connectivity</p> <p>FSP Section 3.3 and 3.5.3</p> <p>'KBHLP Objective 5 – Grizzly Bear Habitat & Connectivity Corridors'. Not applicable to the FDU which includes this block.</p> <p>Block 1 falls within Connectivity Corridor area. Applicable targets for Old and Mature forest will be met following harvest.</p>

STOCKING REQUIREMENTS

SU	NAR (ha)	Standards ID #	Other Performance Standards
A	16.1	1062310	See Section H - Stocking Requirements
B	10.6	1062309	See Section H - Stocking Requirements

C. MANAGEMENT OBJECTIVES & STRATEGIES

<p>C.1 MANAGEMENT OBJECTIVES</p> <ul style="list-style-type: none"> • Objectives for CP 413 Block 1 include meeting visual quality objectives, protecting nearby streams, maintaining water quality, managing for a changing climate, contributing to fire mitigation strategies, and maintaining rich biodiversity and wildlife values: All of these objectives are carefully considered and a balance between all management objectives is the goal. • Harvest this mature stand of FdCwLw(BgHwEpPy) for sawlogs, chips and value-added products and manage for a shaded fuel break and a healthy, free growing stand of planted and natural CwFdLwPw(BgPIPvHw) for similar end products. • Wildlife Tree Retention Area (WTRA): One reserve is planned for retention, totalling 2.7 ha in size (8.4% of the block). The reserve shelters mature stand values, wildlife values, riparian areas and portions of stand structure that is similar to the harvest area. See section C.2a for information on WTRA replacement. • Kootenay Boundary Land Use Plan – Implementation Strategy (June 1997): This block is located within the designated Landscape Unit K12 (Kaslo River)– Intermediate 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: See RESULTS and STRATEGIES section 3.3.2 – Ungulates.

Migratory Bird Habitat Assessment: Block 1 is within Migratory Bird Risk Rating 4 polygon (Age Class 6(5) & Height class 4 – ICH: MixCon - Cw Fdi Lw(Bg Hw Ep Py))The management matrix therefore requires:

- 1) The entire Site must be scheduled for harvest outside Restricted Period 2, OR
- 2) One or more BMP's with DoP rank 2 (moderate) must be selected from the list of BMPs and applied to the Site.

BMP PL1, PL2 and LO2 have been implemented on site to reduce the likelihood of incidental take and to conform with CCC's adopted management strategy. PL1 refers to a high retention silviculture system that will be prescribed for SU A, where 70 stems/ha will be retained. PL2 refers to the implementation of a patch/edge retention system around biodiversity anchors encompassed in the WTRA. LO2 refers to higher levels of retention prescribed surrounding riparian features: This has been implemented with mature timber reserves adjacent to Madden Creeks. BMP PL3 and SO4 have been implemented as well. PL3 refers to the appropriate training of forest planners, layout personnel, and forest workers. SO4 refers to operation specific recommended practices when chance encounters of active nests occur.

Stand/ Site Attributes

Slope values are low to moderate in most of the block and steeper in the north end of the block. Lower to middle elevation ICH dw1 site conditions. Aspect is variable but mainly southeast facing, with short, broken slopes. Lower slope location. Vegetation cover is low over most of the block and moderate on old skid trails and clearings in the southwest end. An NCD (Madden Creek) runs outside the western boundary of the block. Existing coarse woody debris levels are low, 7-20% (15-25cm diameter), in most areas.

SU A: stand type by density is: Cw6 Fdi4 (Bg Hw Lw Ep). Lw snags are present.
SU B: stand type by density is: Cw5 Fdi3 Bg1 Hw1 (Ep Lw). Lw snags are present.
 There is a dead standing and down component of Cw, Hw, Fdi, Lw, Pw, Bg and Ep throughout.

Forest cover adjacent to the block includes similar mature stands outside north, south, east and west boundaries, powerline right-of-way outside the southeast boundary, and previous harvesting outside the northwest boundary.

Actions prescribed:

Total Area specified for the retention of wildlife trees: **2.7 ha** (8.4% of gross area)

Wildlife Tree Retention Area (WTRA):

WTRA-1 (2.7 ha) Fd 4 Lw3 Cw2 Hw1: This WTRA is located along the western boundary of the block. Height range is 15 - 35m; DBH range is 20 – 50cm; Age class is 6-7. Slope values range from low to moderate, and crown closure is 75%. Values within the area include large diameter wildlife trees (Lw snags and Cw vets, forage and cover. CWD levels are low

The WTRA has been established in part, as a best management practice for the reduction of migratory bird incidental take (**BMP PL2**), to ensure compliance with Visual Quality Objectives, and preserve a domestic water source.

WTRA Replacement

This block encompasses a previously logged opening (FL A56529 CP 159 Block 1) to which two WTRAs were assigned. Objectives of the original WTRAs were to reserve an area of high density Lw snags and high cover of coarse woody debris; and to reserve a moisture receiving area with large diameter, open growing Hw.

Management objectives of CP 413 include wildfire hazard mitigation and domestic water source preservation. The original CP 159 Block 1 WTRAs will be replaced with two WTRAs in CP 413 (one in Block 1 and one in Block 2). This replacement will result in the beneficial conservation of higher quality wildlife features and riparian areas. Furthermore, eliminating CP 159 WTRAs 1 and 2 will reduce the wildfire risk of the stand and increase the wildfire resiliency of adjacent landowners properties and the community of Queens Bay.

C.2c FISHERIES

There are no fish streams within or directly adjacent to the block.
 See Section E.1 for Riparian Management Strategies.
 Drainage from the majority of the cutblock area flows downslope to the South, towards Madden Creek and the east towards Pons Pond and Pons Creek.

C.2d WATERSHEDS
See Section 3.4.4 - Consumptive Use Streams
C.2e RECREATION
Not applicable. The proposed cutblock is not located within a designated Recreational Area or Trail with legal objectives.
C.2f BIOLOGICAL DIVERSITY
Landscape Unit - K12 (Kaslo River): Intermediate BEO Assignment.
C.2g VISUAL RESOURCE MANAGEMENT
See Section 3.6 – Visual Quality
C.2h CULTURAL HERITAGE
See RESULTS and STRATEGIES Section 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 Low to Moderate for adjacent mature stands, and Low for adjacent juvenile stands. The block contains dispersed internal retention, internal retention patches and is relatively irregular in shape. Mature stands surrounding the harvest area are similar to the block with moderately well to well drained soils. Some of the adjacent mature stands have already been exposed to windthrow hazard by powerline and right-of-way clearing and previous selection cut. Soils are medium to coarse and moderately well to well drained with 29-40 cm rooting depth.
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			
			SUBZONE	VARIANT & PHASE	SITE SERIES	SITE TYPE
A	1	ICH	dw	1	101 ₇ 104 ₃	-
B	1	ICH	dw	1	104 ⁸ 101 ²	-

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 <u>OR</u> DENSITY FOR RMZ (S) AND LMZ (S).	
-	-	-	-	
NON-CLASSIFIED (NC) RIPARIAN AREAS				
RIPARIAN/LAKE ID	SU XREF	MANAGEMENT STRATEGIES		
Madden Creek (NCD/S6)	WTRA-1	30m RMZ (See note #1 below) : $\geq 10\%$ of the basal area will be retained in WTRA-1. (See additional management strategies below)		
Section E.1 continued				
Riparian Assessment was completed by November 2018 .				
<ol style="list-style-type: none"> Madden Creek (NCD-S6) is an NCD as it passes Block 1 and becomes an S6 further downstream. Water from Madden Creek is used for domestic purposes. Due to community planning commitments this stream is being treated as an S4. 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 (NCD) should be fully rehabilitated upon the completion of harvesting or prior to next freshet. 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 (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
All	DRA	Site factors Host factors Inoculum potential Disease factors	8 4-9 0 12	H L-H L M	<ul style="list-style-type: none"> • Armillaria present at low levels within the stand. • The Nomographic Zones in Section 3.0 of the "<u>Armillaria Root Disease Management Guidelines for the Nelson Forest Region</u>" (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 a species mixture that includes species tolerant and /or moderately susceptible to Armillaria (e.g.: Lw, Py, Pw). Fd (highly susceptible) may be included but should be limited to a 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, steep slopes in SU A, and high soil hazards.
			24-29	M	

Other Forest Health Factors

SU	Code	%	Comments	Current risk to inventory
All	IBD	5	<p>Approximately 5% of stems show signs of IBD, of which nearly all are grey attack, with very little red or green attack noted. Due to the presence of frass, beetles and pupae/larva the infestation is presumed to be ongoing at endemic levels. Due to the risk rating of the stand and the high consequence should an epidemic occur a treatment plan has been designed to manage the infestation.</p> <p>Funnel traps and subsequent trap trees in the area may be utilized if required based on the results of post-harvest spillover probes conducted by a Qualified Professional.</p> <p>Leave tree prescriptions require Douglas Fir that exhibits signs of stress, scarring, decay or general poor health are not to be selected for retention. Depending upon the severity of the infestation post-harvest, MCH packets may be applied to dispersed retention in areas of high IBD presence determined by the assessment of a Qualified Professional.</p> <p>Trap trees may be considered for beetle management if timing of road building and block harvesting permits. This is to be determined by a qualified professional.</p>	Mod
All	DSB	0	Pw is absent or present in minor amounts in the current stand. A small amount of Pw may be planted in SU A. Plant only rust resistant stock. Expect high incidence of white pine blister rust on any naturally regenerated Pw.	nil
All	DML	50	Lw forms approximately 6% of the current stand density and 10% of the current stand volume over the entire block. Roughly 50% of Lw stems showed signs of infection. Lw should be planted >10m from DML infected trees along boundaries	Low

Expected future risks and actions

A forest health/pest incidence assessment is not required. Forest health information was collected during SP field data collection in **November 2018**.

Stand health risks in the future include a warm aspect, lower elevation and possible moisture deficits during the growing season.

Stand type by volume is Fdi₄₅ CW₃₁ LW₁₀ Bg₈ HW₃ Py₂ Ep₁

E.3 VEGETATION MANAGEMENT STRATEGIES

LIVESTOCK TO BE USED FOR VEGETATION MANAGEMENT: YES: NO:

Current Brush Hazard: Low levels of brush inside majority of harvest area. Moderate brush along old skid trails and landings in south end of the block

Future Brush Hazard: Moderate due to mesic and submesic moisture regime, warm aspect and low elevation. Open areas with dry brush complex exist outside the block and at block boundaries, and include maple, birch, aspen, alder, saskatoon, rose, and thimbleberry.

Brushing Methods: Should brushing become necessary, manual treatments are the preferred methods.

Risks and Considerations: Woody brushing or stand tending treatments must be carefully assessed due to pathogen ability to colonize wounds on stocking.

Anticipated Timing: Treatment needs will be assessed through periodic walkthroughs and silviculture surveys. Treatment timing will be prescribed at the time of brush assessment.

E.4 COARSE WOODY DEBRIS (CWD) MANAGEMENT STRATEGIES

Existing coarse woody debris levels are low, 7-20% (15-25cm diameter) in most areas. Lw Fd Ep Bg Cw are the dominant CWD species. The stand has a dead standing and down component. There are small areas of isolated recent blowdown in the north end of the block.

Manage for **minimum** CWD levels post-harvest in accordance with wildfire mitigation strategies. Post-harvest CWD will consist of non-merchantable existing levels and snags, along with residue and breakage. A reduction of CWD levels is anticipated through fire mitigation.

(FPPR Section 68): **Manage for the 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 additional CWD management strategies.

E.5 ARCHAEOLOGICAL IMPACT ASSESSMENT

Archaeological Overview Mapping of the CP 413 area shows that block 1 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	Moderate-High	Moderate	Moderate-High	60	60	No restricting layer to 60cm
B	High	Moderate	High	60	60	No restricting layer to 60cm

F.2 SOIL DISTURBANCE LIMITS		
SU A: ARE THERE SENSITIVE SOILS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
SU B: ARE THERE SENSITIVE SOILS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
MAX. PROPORTION OF TOTAL AREA UNDER THE PRESCRIPTION ALLOWED FOR PERMANENT ACCESS STRUCTURES (PAS): 8.7%		
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%
Maximum soil disturbance levels may be exceeded for short periods of time; however any temporary access structures or 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 or excavated or bladed trails, if any.

Avoid harvesting during spring freshet/breakup conditions when soils are moist to reduce soil displacement and compaction.

Steep slopes >35% are present in parts of the block and are noted on the **Harvest Plan Map**. In SU A: TU 1, TU 3 and SU B ground based harvest methods will be utilized. In SU A: TU 2 cable harvesting methods will be used.

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.

Proposed Landings (temporary):
SU A: 1.5 landings @ 0.2 ha = **0.3 ha**
SU B: 1.5 landings @ 0.2 ha = **0.3 ha**

- **SU A TU 1 and 3 and SU B: Favorable and adverse skidding to roadside and landings.**
- **SU A TU 2: Uphill cable yarding**
- **See Section E.1 for stream 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 woody debris that is conducting subsurface moisture
- Place fill material that was sidecast on the excavated portion of the trail
- Re-contour the slope
- Re-establish natural surface drainage
- Place some woody debris over exposed mineral soil

G. SILVICULTURAL SYSTEMS

SILVICULTURAL SYSTEMS	
SU	SYSTEM / VARIANT / PHASE
A	Clear-cut with reserves silviculture system.
B	Retention silviculture system.
STAND STRUCTURE AND SITE CONDITION - COMMENTS	
<p>Post-harvest stand structure will be even-aged with one age class.</p> <p>Planted trees and natural regeneration in SU A will include Fd Lw Cw Pw (PI Bg Py Hw).</p> <p>Wildlife Tree Group Reserve Area (WTRA): totalling 2.7 ha</p> <p>Leave Trees:</p> <ul style="list-style-type: none"> • SU A <ul style="list-style-type: none"> ○ TU 1 (Ground based harvesting): Retain 20-25 stems/ha. Target Larger diameter Fdi, Lw and Py in the ≥30cm DBH classes. ○ TU 2 (Cable harvesting): Retain 20-25 stems/ha of Fdi, Lw and Py in the ≥30cm DBH classes Retain stems in small clumps or single trees. Do not substitute other species. For visual screening objectives the majority of the stems will be retained below the road between yarding corridors. ○ TU 3 (Ground based harvesting): Retain 20-25 stems/ha. Preference: Retain Hw ≥50cm DBH class and target Fdi, Lw and Py in the ≥30cm DBH classes. • SU B (Ground based harvesting): Retain 65 stems/ha, where available, in the ≥30cm DBH ranges to manage for wildfire mitigation as well as to provide stand structure, biodiversity, visual, and wildlife values. Fdi, Lw and Py are preferred leave trees; Hw ≥35cm DBH class may be retained to achieve target density and distribution for the objective of a shaded fuel break where an even distribution of preferred leave trees is unavailable. (See Section H2 for leave tree standards). <p>Even-Aged Fire Management Stocking Standards (SU A)</p> <p>To address fire management objectives these even-aged stocking standards promote lower conifer stocking, include deciduous species, indicate a preference for fire resistant species and consider climate change.</p> <p>Wildfire Mitigation / Shaded Fuel Break (SU B)</p> <p>Py, Fd, and Lw are more likely to survive a fire than the other species on site. Thinning the stand from above while retaining fire resilient stems and minimizing the surface fuels to meet the minimum CWD requirements is a recognized fire mitigation management plan. The objective is to retain larger, healthy stems with live crowns while maintaining a 3-5-m spacing between the crowns. The larger leave trees have higher crowns, which means a longer distance between surface fuels and tree crowns; reducing the effective ladder fuels, and reducing the likelihood of the fire moving into the canopy. Regularly spaced leave trees will shade the understory, which will help reduce ground temperatures and prevent brush species from becoming established, further reducing the ladder fuels. Leave tree distribution is expected to be regular where large stems exist and is operationally feasible to do so. Adequate inter-crown spacing prevents the spread of a potential wildfire between leave trees, while still providing ground shading. Post harvest the stand will be easier to protect should a fire occur – fire will move more slowly through the stand due to less ground fuel, an open stand with clean ground & a more open canopy that will let more water and fire retardant through to the ground from air drops than a full canopy stand. The roads and trails constructed to access the block will provide better access for the fire fighters.</p> <p>Snags</p> <p>No snags or stubbed trees are prescribed to be left behind in the block, as they are a hazard from a fire management perspective. Live vets and larger stems selected as leave trees will provide wildlife values post-harvest.</p>	

H. STOCKING REQUIREMENTS (As per Fire Management/Wildland Urban Interface (WUI) Stocking Standards for Selkirk Resource District South Columbia - November 20, 2018)

LICENCE #	CP	BLOCK	OPENING NUMBER	LOCATION
A30171	413	1	82F066	Queens Bay

H1 ECOLOGICAL INFORMATION										
SU	Net Area (ha)	Zone	Subzone	Variant/Phase	Site Series (complex - %)	Elevation			Slope position	Soil Texture (0-30cm)
						Min	Max	Avg		
A	16.1	ICH	dw	1	101 ₇ 104 ₃	730	870	800	Lower	SiL-SL
B	10.6	ICH	dw	1	104 ₈ 101 ₂	730	840	785	Lower	SiL

RATIONALE FOR STOCKING STANDARD FSP ID SELECTION		
STANDARDS UNIT FSP ID #	CHANGE FROM STANDARD PRACTICE	COMMENT: (For example: Forest health (DRA) or Rocky site)
A: 1062310	N/A	101 leading - site series complex. Even-Aged Fire Management Stocking Standards
B: 1062309	N/A	104 leading site series complex. Fire Management Partial Cut

H2 STOCKING REQUIREMENTS FOR SILVICULTURAL SYSTEMS OTHER THAN SINGLE TREE SELECTION (As per Fire Management/Wildland Urban Interface (WUI) Stocking Standards for Selkirk Resource District South Columbia - November 20, 2018)

Standards Unit	Standards ID	Regen Delay (yrs)	Free Growing Early (yrs)	Free Growing Late (yrs)				
A	1062310	7	12 [†]	20				
Preferred Species		Acceptable Species		Post Spacing Density (sph)	Max Coniferous (sph)			
Species	Min FG ht (m)	Species	Min FG ht (m)	Min	250	Max	600	800 [‡]
Fd ⁵⁸ Lw Py Pw ³¹	Fd,Pw-1.4, Lw-2.0, Py-1.0	Pl Cw Bg At Ep	Pl, At Ep-2.0 Cw, Bg -1.0	Well Spaced Trees (sph)				
				Target	Minimum pref&acc	Minimum preferred	Min Horizontal Inter-tree distance (m)	
				400	250	200	2.0*	
				'M' Value		Height Relative to Competition (%)		
4		150						

Standards Unit	Fire Management Partial Cut (Shaded Fuel Break) Stocking Standard (As per Fire management/Wildland Urban Interface (WUI) stocking standards for Selkirk Resource District South Columbia November 20, 2018)			
B	The resulting stand may be considered sufficiently stocked in the overstorey, and regeneration obligations will not be incurred if a minimum 12m ² /ha basal area of preferred and acceptable leave trees is retained 1-3 years post harvest. .			
Standards ID	Acceptable leave trees must be dominant or co-dominant layer trees >17.5 cm dbh, and:			
1062309	<ul style="list-style-type: none"> > 25% live crown with no indicators of decline; Free of gouges and wounds > 1/3 of stem circumference; and Free of wounds on a supporting root within 1 m of the stem. 			
	Min. Basal Area / ha:	12m ²	Assessment Period:	1-3 years post harvest
	Preferred Species:	Fd Lw Py Pw	Acceptable Species:	Bg Pl Ac At Ep Cw Hw

* - a reduced MITD of 1.7m may be used to facilitate planting superior microsites, when sites have: mechanical site preparation (mounding and disk trenching), been previously fill planted, or conditions where obstacle planting for snow creep is necessary. Reduced MITD applies to PLANTED TREES ONLY

† - Early Free Growing has been left in for information purposes only. In RESULTS it is in the comments section only and does not preclude making FG declarations early.

‡ - All conifers >50cm are countable for the purpose of assessment of maximum conifer stocking.

Other Required Stocking Information/Footnotes :

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 in the IDFmw and all subzones of the ICH due to root rot. See Root Rot Handbook (2017, in press).

H3 SITE PREPARATION

TECHNIQUE (S) / LIMITING FACTORS

Options for SU A include:

- Mechanical bunching (pile and burn) where feasible to minimize CWD as a method of wildfire mitigation.
- Piles may be left unburned to contribute to wildlife habitat and coarse woody debris values; however all roadside and landing piles should be burned to abate wildfire risk.
- Manage CWD and slash with a goal of future wildfire mitigation; minimize surface fuels post-harvest. Harvesting to create a shaded fuel break (SU A) and reducing the forest floor fuels removes most of the aboveground biomass and creates a good firebreak given the limited fuel remaining. This will reduce the intensity of a potential fire, and make it easier for firefighters to suppress. This does not mean removing all organic material down to mineral soil; just to reduce significant accumulations of surface fuel.
- Care should be taken while working around leave trees to avoid damage to the stems.
- Broadcast Burn may be the only practical option in SU A TU 2 (Cable harvesting) due to steep slopes.

H4 PLANTING

SU	Area (ha)	Regen. Method	Species	Age	Stock Type	Season	Stems/Ha	Total Stems
A	16.1	Plant	FdLwCwPw (PyHw)	1+0	PSB 412A	Spring	400-600	6,440-9,660

No planting is prescribed for SU B. See section **G. SILVICULTURAL SYSTEMS**

LIMITING FACTORS / COMMENTS:

- Fd limited to a maximum of 50% of preferred and acceptable well-spaced stems.
- Bg is an acceptable species, and moderate amounts of natural Bg regen exist within certain areas the block. Expect quantities of natural regeneration.
- Manage for a high diversity of planted trees as a climate change adaptation strategy. Increasing species diversity may help buffer the negative impacts of climate change, and make forests more resilient when faced with extreme weather events. This strategy is meant to reduce the forest health risks to future timber supply by providing a diversity of species should one or more become susceptible to pests or other damaging agents.
Replanting these stands with a higher diversity of species, including species that are more adapted to hotter and drier growing conditions like Lw and Py, will promote a stand that is more likely to tolerate a warming climate.
- Microsite selection for Lw, Pl, and Py should be concentrated to dry sites, with Cw populating draws and cold air exposures.
- Limiting factors include a warm aspect and shallow soils. Moisture deficits are expected to persist through the summer.
- Plant as soon as possible following harvesting or site prep operations. **Note:** a post-harvest assessment should be completed to assess the necessity of site preparation prior to planting. If site prep is needed, the person completing the assessment will generate a prescription surrounding the areas that are required and the methods to be employed.
- Anticipated Timing/Constraints: Treatment needs will be assessed through periodic walkthroughs and silviculture surveys.
- Monitor for signs of ungulate browse during silviculture surveys.

H5 BRUSHING / STAND TENDING

TECHNIQUE (S) / LIMITING FACTORS

Brushing:

SU A (*Broadleaf species are considered beneficial from a fire mitigation perspective as they are generally less flammable than other coniferous species and as a result may reduce fire behavior however adequate free growing density of preferred and acceptable crop trees, free from deleterious competition, must be established*)

- **Brush Hazard:** Current hazard is low with very little shrub cover throughout the block. Future hazard is moderate due to mesic to submesic moisture regime, and a warm aspect at low elevations. Open areas with dry brush complex exist outside the block and at block boundaries. Competitor species include maple, birch, alder, saskatoon, rose, bracken fern, and thimbleberry.
- **Brushing Methods:** Should brushing become necessary, manual treatments are the preferred methods.
- **Risks and Considerations:** Woody brushing or stand tending treatments must be carefully assessed due to pathogen ability to colonize wounds on stocking.
- **Anticipated Timing:** Treatment needs will be assessed through periodic walkthroughs and silviculture surveys. Treatment timing will be prescribed at the time of brush assessment.

SU B: As establishment of a regenerated stand is not an objective of this prescription, brushing will not be necessary.

Juvenile Spacing:

SU A

- Maximum *conifer* density is 800 stems / ha.
- An assessment should be completed at, or prior to, early free growing to determine if a juvenile spacing treatment is necessary.
- Countable height is **50cm** for all conifers.

See *Fire management/Wildland Urban Interface (WUI) stocking standards for Selkirk Resource District South Columbia November 20, 2018*

I. ADMINISTRATION

RPF SIGNATURE AND SEAL:

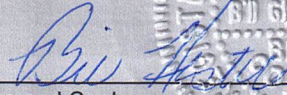
Bill Kestell

RPF Name (Printed)

I certify that I have reviewed this document and, while I did not personally supervise the work described, I have determined that this work has been done to the standards expected of a member of the Association of British Columbia Forest Professionals.

Date: September 24, 2020 RPF #: 2923

RPF Signature and Seal




SITE PLAN PREPARED BY:

Tom Haukaas, RFT

MAJOR LICENSEE SIGNING AUTHORITY:

SITE PLAN ATTACHMENTS:

- SP MAP(S)
- ARCHAEOLOGICAL IMPACT ASSESSMENT
- TERRAIN STABILITY FIELD ASSESSMENT
- VISUAL IMPACT ASSESSMENT
- RIPARIAN ASSESSMENT
- FOREST HEALTH / PEST INCIDENCE ASSESSMENT
- SOIL CONSERVATION TABLE
- OTHER: REFORESTATION PRESCRIPTION
- OTHER: ARMILLARIA RISK ASSESSMENT MATRIX

Licence Holder Signing Authority Signature

Licence Holder Signing Authority Name (Printed)

Date: _____

	Standards Units				TOTAL HA	%
	A	B				
HAZARD RATINGS:						
Compaction	High	Moderate				
Soil Displacement	Moderate-High (10-20)	Moderate(7)				
Surface Erosion	High (27)	Moderate (21)				
Forest Floor Displacement	High (17 20)	Moderate (14)				
Mass Wasting	Moderate to High (28-51)	Moderate (25)				
Harvest System	Ground Based / Cable	Ground Based				
TOTAL AREA	19.8	12.4			32.2	
Wildlife Tree Patches / NP Nat						% WTP/IMM
WTRA	2.7	-			2.7	8.4
IMM	-	-			-	-
Permanent Access Structures						% Disturbance
Proposed roads	0.5				0.5	1.6
Existing roads	0.5	1.8			2.3	7.1
Landings	-					
Total disturbance permanent access structures	1.0	1.8			2.8	8.7
NET AREA TO BE REFORESTED	16.1	10.6			26.7	
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)	5% (excavated/bladed trails)				
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: Landings within the NAR are temporary and will be fully rehabilitated.						
Rehabilitation/Deactivation measures:						
All landings and trails within the NAR are temporary and will be rehabilitated by decompacting, re-contouring, surface restoration, followed by planting.						
Landings will be deactivated as per the following: Minimize runoff flowing onto the landing and minimize erosion of the landing fill material by incorporating appropriate drainage systems. If required, carry out measures to ensure that the landing is stable, such as decompaction, re-contouring, and grass seeding.						
Perm Road:						
Proposed:						
Spur 1: 254.1m x 20m = 0.5 ha						
Existing:						
SU A: 326.3m x 15m = 0.5 ha						
SU B: 897.5m x 20m = 1.8 ha						
Total PAS: 2.8 ha						
Proposed Landings (temporary):						
SU A: 1.5 landings @ 0.2 ha = 0.3 ha						
SU B: 1.5 landings @ 0.2 ha = 0.3 ha						
See Section F.4 for discussion of rehabilitation of excavated/bladed trails.						