SITE PLAN CP 414 BLOCK 1
COOPER CREEK CEDAR LTD.

A. TENURE IDENTIFICATION

LICENCE NO.:	CP:	BLOCK:	TIMBER MARK:	UTM:	LICENSEE NAME:
FL A30171	**414**	**1**	**FE5414**	**492400 E, 5578200 N**	**Cooper Creek Cedar Ltd.**
AREA UNDER TENURE (ha):	MAPSHEET/OPENING #:		ELEVATION:	LOCATION:	
42.5	**82K035**		**1585-1800m**	**Deep Creek**	

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 RESERVE	TOTAL NPR AREA
1.3	**-**	**-**	**-**	**-**	**-**	**2.3**	**-**	**3.6**	**7.2**

NET AREA TO BE REFORESTED (ha)		
SU	SU AREA DESCRIPTION	NET AREA TO BE REFORESTED:
A	**ESSFwh1 $110_{7}101_{3}$** The block is located in the Deep Creek drainage upslope of the Lardeau River. The aspect of SU A is mainly east facing, slopes range from 13 to 45% with an average of 29%. Surface and subsoil texture is Silty Loam (SiL). Soils are well drained. Coarse fragment content is Low (30%) in surface soils and moderate (45%) in subsoils. Moisture regime is mesic to subhygric and nutrient regime is medium. Humus form is a thin mor (4cm thickness) and rooting depth is 40cm. Soils in SU A exhibit **non-sensitive** characteristics. Average stand density (all species) is 385 stems/ha. Most stems fall within the 20-50cm DBH classes, with 7% of stems in the 55-90cm DBH class. Approximate species densities are Sx 211 stems/ha and Bl 174 stems/ha. Stand age ranges from 92-244 with an average of 168 years old. The understory contains low densities of Bl (SxHw) regen, saplings and poles that are mainly in poor (suppressed) to moderate condition but growing well in openings. SU A will be harvested with **Conventional Ground Based** methods and a clearcut silviculture system.	**7.1**
B	**ESSFwc4 $110_{9}101_{1}$** The aspect of SU B is mainly east facing, slopes range from 10 to 45% with an average of 27%. Surface soil texture is Silty Loam to Silty Clay Loam (SiL-SiCL), and subsoil texture is Sandy Clay Loam to Silty Clay Loam (SCL-SiCL). Soils are moderately well drained. Coarse fragment content is Low (20%) in surface soils and moderate (45-50%) in subsoils. Moisture regime is mesic to subhygric and nutrient regime is medium. Humus form is a thin mor (3cm thickness) and rooting depth is 25-28cm. Soils in SU B exhibit **sensitive** characteristics. Average stand density (all species) is similar to SU A. SU B will be harvested with **Conventional Ground Based** methods and a Retention silviculture system.	**24.4**
C	**ESSFwh1 110** The aspect of SU C is mainly northeast facing, slopes range from 18 to 33% with an average of 26%. Surface soil texture is Silty-Loam (SiL), and subsoil texture is Sandy Clay Loam (SCL). Soils are imperfectly drained. Coarse fragment content is Low (10-30%). Moisture regime is subhygric and nutrient regime is medium. Humus form is a moder (5.5cm thickness) and rooting depth is 31cm. Soils in SU C exhibit **sensitive** characteristics. Average stand density (all species) is similar to SU A. SU C will be harvested with **Conventional Ground Based** methods and a clearcut silviculture system.	**3.8**
	TOTAL NET AREA TO BE REFORESTED:	**35.3**
	TOTAL AREA UNDER THE PLAN:	**42.5**

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%	3.1%
B	5.0	5.0		
C	5.0	5.0		

SU	CRITICAL SITE CONDITIONS THAT AFFECT THE TIMING OF OPERATIONS AND HOW THEY AFFECT THEM
A,B,C	• 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' For the purposes of biodiversity analysis this block falls in ESSFwc4, and within Connectivity Corridor. Landscape Unit K17 Goat Range. For the ESSFwc4, there is a Mature + Old forest requirement in this landscape unit. Analysis completed by Timberland (April, 2019) shows that post-harvest there will be a surplus of Mature + Old within the Landscape Unit ESSFwc4 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). 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. No cultural heritage values were noted in this area.
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. See Section **C.2e RECREATION** for additional information.
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) **S6 1-3** runs outside the southern block boundary. **S6 1-2** runs through WTRA-1. 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 does not** contain sensitive soils and soil disturbance will not exceed **10%**. **SU B and C** contain sensitive soils and soil disturbance will not exceed **5%**. 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 not exceed the recommended limit of **7.0%** and is estimated at **3.1%.** 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)	A Visual Impact Assessment was completed for CP 409, 412 and 414 by Timberland Consultants in May 2019. Portions of two cutblocks (CP412-15 and 409-4) fall within polygons with a VQO of Modification and the remaining cutblocks fall within area that is not visually sensitive. The proposed development of this CP meets the established VQO of M from the selected viewpoints.
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' – **Block 1** is not within a domestic or community watershed. There are no licensed POD's for the purpose of water consumption on Deep Creek.

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)	Two internal Wildlife Tree Retention Areas are planned for this block, totalling **2.3 ha**. Overall wildlife tree retention percentage for block 1 is approximately **5.4%.** Total WTRA for CP414 is **12.8 ha** which constitutes approximately 7.2**%** of the gross area of the permit. The WTRA area meets the minimum percent requirements stated in the FSP for each block (3.5%) and for the whole cutting permit (7%).
Result or Strategy Description	**3.3.2 - Ungulates**
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	**Block 1** is outside designated Ungulate Winter Range.

ADDITIONAL COMMENTS

Consistency Statement

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 414 Block 1**, in accordance with FRPA Section 10(1), (2) & (3).

Earlier in development this block was labeled as CP 412 block 1

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 1 is not within an Enhanced Resource Development Zone.

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 requirement to create a Result/Strategy for this objective does not apply.

Fisheries Sensitive Watersheds

FSP Section **3.4.2**

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.

Invasive Plants

FSP Section **4.1** – Invasive Plants

The IAPP website was checked on February 4, 2019. The following invasive species were reported in nearby areas to **CP 414 (Deep Creek),** mainly at low elevations along Highway 31: Canada thistle, Chicory, Common tansy, Oxeye daisy, Spotted knapweed, Orange hawkweed, Yellow hawkweed, Yellow devil hawkweed, King devil hawkweed, Hawkweed species and Burdock.

Measures to prevent the introduction or spread of invasive plants noted in the FSP include:

- 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:
  - 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.

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 *GAR Order #U-14-012 – Mountain Caribou – Southwest Kootenay Planning Unit.* 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 1 falls within Connectivity Corridor area. Applicable targets for Old and Mature forest will be met following harvest.

STOCKING REQUIREMENTS

SU	NAR (ha)	Standards ID #	Other Performance Standards
A	7.1	1057021	See Section H - Stocking Requirements
B	24.4	1056984	See Section H - Stocking Requirements
C	3.8	1057021	See Section H - Stocking Requirements

C. MANAGEMENT OBJECTIVES & STRATEGIES

C.1 MANAGEMENT OBJECTIVES

- Objectives for **CP 414 Block 1** include protecting nearby streams, maintaining water quality, managing for recreation values, and maintaining rich biodiversity and wildlife values: All of these objectives are carefully considered, and in some cases there are trade-offs in strategies but a balance between all management objectives is the goal.
- Harvest this mature stand of **SxBl** for sawlogs, chips and value-added products and manage for a healthy, free growing stand of planted and natural **Sx(BlCwHw)** for similar end products.
- **Wildlife Tree Retention Area (WTRA):** Two reserves are planned for retention, totalling **2.3 ha** in size (5.4% of the block). The reserves shelter mature stand values, wildlife values, riparian areas and portions of stand structure that is similar to the harvest area.
- **Kootenay Boundary Land Use Plan – Implementation Strategy (June 1997):** This block is located within the designated **Landscape Unit K17** (Goat Range) - High BEO Assignments.

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 1 is outside designated ungulate winter range.

Migratory Bird Habitat Assessment: Block 1 is within Migratory Bird Risk Rating 5 polygon (Age Class derived from cruise data 7/8 & Height class 4 – SwB: Spruce Balsam Leading-Sx Bl)The management matrix therefore requires:

1) The entire Site must be scheduled for harvest outside Restricted Period 1 (April 23 – August 1 - Add 7 days to each date for ESSF zones to account for higher elevations)) , OR
2) Two or more BMP's with DoP rank 2 (moderate) or DoP rank 3 (high) must be selected from the list of BMPs and applied to the Site.

BMP PL2 and LO2 have been implemented on site to reduce the likelihood of incidental take and to conform with CCC's adopted management strategy. PL2 refers to the implementation of a patch/edge retention system around biodiversity anchors encompassed in the WTRAs. LO2 refers to higher levels of retention prescribed surrounding riparian features: This has been implemented with mature timber reserves adjacent to S6-1-3 and S6-1-2.
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 the block, with short steeper slopes in the southern parts of the block. Middle to upper elevation ESSFwh1 site conditions and lower ESSFwc4 conditions, and transitional characteristics where the zones meet. Aspect is mainly east facing, with long uniform slopes. Middle to upper slope location. Vegetation cover is moderate to high over most of the block with consistent shrub cover. An S6 class stream runs through WTRA-1. An S6 stream exists outside the block on the south side. Road access will be new construction. Existing coarse woody debris levels are low 10-15% cover (25-50cm diameter) and mainly consisting of Bl felled and bucked for the purposes of ski run glading.

SU A: stand type by density is: Sx6 Bl4.

SU B: stand type by density is: Bl6 Sx4

SU C: stand type by density is: Sx7 Bl3.

Average stand density (all species) is 385 stems/ha. Most stems fall within the 20-50cm DBH classes, with 7% of stems in the 55-90cm DBH class. Approximate species densities are Sx 211 stems/ha and Bl 174 stems/ha. Stand age ranges from 92-244 with an average of 168 years old. The understory contains low densities of Bl (SxHw) regen, saplings and poles that are mainly in poor (suppressed) to moderate condition but growing well in openings.

Forest cover adjacent to the block includes similar mature stands outside south and west boundaries, and previous logging outside north and east boundaries.

Actions prescribed:

Total Area specified for the retention of wildlife trees: **2.3 ha** (5.4% of gross area)

Wildlife Tree Retention Patch (WTRA):

WTRA-1-1 (1.8 ha) Sx5Bl5: This WTRA is located surrounding an S6 class stream and contains a similar stand structure to the adjacent harvest area. Density is 200 - 600 stems/ha; Height range is 20 - 30m; DBH range is 20 – 50cm; Age class is 8. Slope values range from low to moderate, and crown closure is 30%. Values within the area include high vegetation cover and browse. Wildlife trails and scat were seen within the WTRA. Vegetation cover includes rhododendron, vaccinium species and devils club. Evidence of western bark beetle and root disease were noted.

WTRA-1-2 (0.6 ha) Bl7Sx3: This WTRA is located in the south end of the block surrounding steeper slopes and contains more non-merchantable stems to the adjacent harvest area. Density is 400 - 800 stems/ha; Height range is 16 - 30m; DBH range is 20 – 50cm; Age class is 8. Slope values range from moderate to high, and crown closure is 40%. Values within the area include browse, cover and snags. Woodpecker activity was noted in Bl snags.

WTRA's will provide stand structure values for wildlife, perching and cover values, and riparian values. Coarse woody debris values will also be created over time from dead and fallen stems. The WTRAs have been established in part, as a best management practice for the reduction of migratory bird incidental take **(BMP PL2)**, and to mitigate risk to downslope terrain hazards.

Snags

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

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 East, towards the Lardeau River.

C.2d WATERSHEDS

CP 414 Block 1 is not within a domestic or community watershed.

C.2e RECREATION

Skiing Tenure: Four 30-40m wide strips (totalling 3.6 ha) with 100% retention will be established to provide visual reference, protect from avalanche terrain and reduce wind-effected snow and windthrow hazard. As well, a10m partial harvest buffer will be established on either side of the full retention strips in which 50% of mature stems (targeting Sx for removal) and 100% of understorey will be retained.

C.2f BIOLOGICAL DIVERSITY

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

C.2g VISUAL RESOURCE MANAGEMENT

See Section 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 **Moderate** for adjacent mature stands and **Low** for adjacent immature stands. The block is relatively irregular in shape and contains internal reserves designed, in part, to reduce windthrow hazard. Mature stands surrounding the harvest area are similar to the block with moderately well drained soils. Adjacent stands have been partially exposed to windthrow hazard by previous logging and ski run glading.

Soils are medium to fine textured and moderately well drained with 25-40 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

	BIOGEOCLIMATIC					
SU	**TREATMENT UNIT**	**ZONE**	**SUBZONE**	**VARIANT & PHASE**	**SITE SERIES**	**SITE TYPE**
A	1	ESSF	wh	1	110_7101_3	-
B	1	ESSF	wc	4	110_9101_1	-
C	1	ESSF	wh	1	110	-

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).
S6 1-2	Y	A, WTRA-1	**20m RMZ**: ≥80% of the basal area will be retained in WTRA-1. Portions of Spur 1-6 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) (See additional management strategies below)
S6 1-3	Y	A	**20m RMZ:** ≥90% of the basal area will be retained outside the southern harvest boundary. Portions of Spur 1-2 fall within the RMZ, outside of the harvest area, 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) (See additional management strategies below)

NON-CLASSIFIED (NC) RIPARIAN AREAS

RIPARIAN/ LAKE ID	SU XREF	MANAGEMENT STRATEGIES
NCD 1-3,4,5,6,7	A,B,C	(See management strategies below)

Section E.1 continued

Riparian Assessment was completed by Timberland in **September 2018**.

1) **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.
2) 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.
3) All **machine trails** and **crossings** (NCD) should be fully rehabilitated upon the completion of harvesting or prior to the next freshet. Excess material that could cause redirection of natural drainage patterns should not be left at crossing locations.
4) **All surface drainage patterns** should be maintained and any that are disrupted as a result of harvesting operations should be restored immediately.
5) **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.
6) **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
A,B, C	DRA	Site factors Host factors Inoculum potential Disease factors	**8** **6** **0** **12** **27**	H M L L **M**	• Armillaria is present at low levels within the stand. IBB noted in some DRA infected Bl. • 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 a species mixture that includes species tolerant and /or moderately susceptible to Armillaria (e.g.: Cw). 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.

Other Forest Health Factors

SU	Code	%	Comments	Current risk to inventory
A,B,C	IWS	0	Monitor for white pine weevil in planted or naturally regenerated Sx during silviculture surveys.	Mod
A,B,C	IBS	0	Absent to Very Low incidence of Spuce beetle. Sx forms 55% of the density and 69%of the stand volume.	Low
A,B,C, D	IBB	<5	Western balsam bark beetle was noted in grey and red attack Bl. Bl forms roughly 31% of the stands volume and 45% of the stand density. Occurrence and mortality likely associated with DRA.	Mod

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 heavy snowpack on a cool aspect and ungulate browse (moose).

Stand type by volume is: Sx_{69} Bl_{31}.

E.3 VEGETATION MANAGEMENT STRATEGIES

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

Current Brush Hazard: SU A,B,C: Moderate to high levels of brush inside harvest area including rhododendron, vaccinium species, gooseberry, thimbleberry and lady fern.

Future Brush Hazard: Moderate to high due to mesic to subhygric moisture regime, cool aspect and established community.

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 10-15% cover (25-50cm diameter) and mainly consisting of Bl felled and bucked for the purposes of ski run glading. The stand has a dead standing and down component. Most larger pieces have been bucked into <5m segments.

Post-harvest CWD will consist of non-merchantable existing levels and snags, along with residue and breakage.

(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 414** 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

	HAZARD RATINGS			SOIL CHARACTERISTICS		
SU	SOIL COMPACTION	SOIL DISPLACEMENT	SURFACE SOIL EROSION	DEPTH TO UNFAVOURABLE SUBSOIL (cm)		TYPE OF UNFAVOURABLE SUBSOIL
				MIN(cm)	MAX(cm)	
A	High	Moderate	High	65	65	No restricting layer to 65cm
B	Very High	Moderate	High-Very High	60	60	No restricting layer to 60cm
C	High	Moderate	Very High	60	60	No restricting layer to 60cm

F.2 SOIL DISTURBANCE LIMITS

SU A: ARE THERE SENSITIVE SOILS? ☐ YES ☒NO

SU B: ARE THERE SENSITIVE SOILS? ☒ YES ☐NO

SU C: ARE THERE SENSITIVE SOILS? ☒ YES ☐NO

MAX. PROPORTION OF TOTAL AREA UNDER THE PRESCRIPTION ALLOWED FOR PERMANENT ACCESS STRUCTURES (PAS): **3.1%**

Roadside harvesting or temporary landings will be used.

DEACTIVATION OF PERMANENT ACCESS STRUCTURES: Any 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	**5%**	**5%**
C	**5%**	**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 SU A, B and C and are noted on the **Harvest Plan Map.** Ground based harvest methods will be utilized.

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,C	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: 2 landings @ 0.2 ha = **0.4 ha**
SU B: 4 landings @ 0.2 ha = **0.8 ha**
SU C: 1 landing @ 0.2 ha = **0.2 ha**

Proposed Roads (permanent):
Spur 1-2 = 1089.4m x 12m = **1.3 ha**

Temporary Roads:
Spur 1-1 = 60m x 10m = **0.06 ha**
Spur 1-3 = 593m x 10m = **0.59 ha**
Spur 1-4 = 90m x 10m = **0.09 ha**
Spur 1-5 = 89m x 10m = **0.09 ha**
Spur 1-6 = 78m x 10m = **0.08 ha**

Total PAS = **1.3 ha**

- **Favourable skidding to roadside and landings.**
- **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,B,C	Clear-cut silviculture system.
SU	**STAND STRUCTURE AND SITE CONDITION - COMMENTS**
A,B,C	Post-harvest stand structure will be even-aged with one age class. Planted trees and natural regeneration will include **Sx Bl (Cw Hw).** **2 Wildlife Tree Group Reserve Areas (WTRA):** totalling 2.3 ha **4 Visual Reference Retention Strips:** totalling 3.6 ha. Each strip has an additional 10m buffer on either side in which 50% of mature stems will be retained as well as 100% of understorey. No mature leave trees are planned for the remainder of the harvest areas

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

LICENCE #	CP	BLOCK	OPENING NUMBER	LOCATION
A30171	414	1	82K035	Deep Creek

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	7.1	ESSF	wh	1	110_7101_3	1585	1715	1668	Upper	SiL
B	24.4	ESSF	wc	4	110_9101_1	1640	1800	1720	Upper	SiL-SiCL
C	3.8	ESSF	wh	1	110	1585	1645	1615	Upper	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: 1057021	N/A	110 leading – site series complex
B: 1056984	N/A	110 leading – site series complex
C: 1057021	N/A	

H2 STOCKING REQUIREMENTS FOR SILVICULTURAL SYSTEMS OTHER THAN SINGLE TREE SELECTION

Standard unit	Standards ID	Regen Delay (yrs)		Free Growing Early (yrs)			Free Growing Late (yrs)	
A	1057021	4		12**			20	
Preferred Species		**Acceptable Species**		**Post Spacing Density (sph)**				**Max Coniferous (sph)**
Species	min ht(m)	Species	min ht (m)	**Min**	700	**Max**	1800	10,000
Bl^{500} Sx	All- 1.0	$Cw^{14,32}$ $Hw^{14,32}$	All- 1.0	**Well Spaced Trees (sph)**				
				Target	**Minimum pref&acc**		**Minimum** preferred	**Min Horizontal Inter-tree distance (m)**
				1200	700		600	2.0*
							Height Relative to Competition (%)	
							125	
B	1056984	4		12**			20	
Preferred Species		**Acceptable Species**		**Post Spacing Density (sph)**				**Max Coniferous (sph)**
Species	min ht (m)	Species	min ht (m)	**Min**	700	**Max**	1800	10,000
Bl^{500} Sx	All- 0.8	-	-	**Well Spaced Trees (sph)**				
				Target	**Minimum** pref&acc		**Minimum** preferred	**Min Horizontal Inter-tree distance (m)**
				1200	700		600	2.0*
							Height Relative to Competition (%)	
							125	
C	1057021	4		12**			20	
Preferred Species		**Acceptable Species**		**Post Spacing Density (sph)**				**Max Coniferous (sph)**
Species	min ht(m)	Species	min ht (m)	**Min**	700	**Max**	1800	10,000
Bl^{500} Sx	All- 1.0	$Cw^{14,32}$ $Hw^{14,32}$	All- 1.0	**Well Spaced Trees (sph)**				
				Target	**Minimum pref&acc**		**Minimum** preferred	**Min Horizontal Inter-tree distance (m)**
				1200	700		600	2.0*
							Height Relative to Competition (%)	
							125	

** 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.

Other Required Stocking Information/Footnotes :

14 – suitable at lower elevations

32 – limited by growing-season frosts.

500 – Advance Bl 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.

* - 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

I. ADMINISTRATION

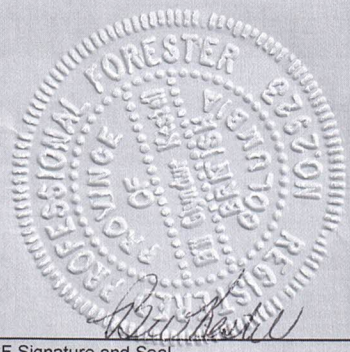
RPF SIGNATURE AND SEAL:

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: 2020-02-20 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: _____

H.3 SITE PREP

SU	PREFERRED	ALTERNATE
A, B, C	- 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. - Mechanical site preparation (e.g.: mounding, scarification) where necessary and feasible, combined with brush/slash piling, utilizing an excavator.	- No site prep, plant as is. - 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.

Site Limiting Factors include:

Mesic to subhygric soil moisture.

Few areas of **35+%** slopes and dispersed rock.

Moderate existing CWD levels including large mature pieces felled and bucked for ski glading.

Cool Northeast aspect. Upper elevation location.

NCD channels at the south end of the block and adjacent to harvest boundary. For **machine use**, minimize crossings on **NCD channels** to the extent possible.

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.

H.4 PLANTING / SEEDLING REQUIREMENTS

	STOCK				SEASON
SU	SPECIES	AGE	TYPE	CNTR	
A,C	Sx (Bl Cw Hw)	1+0	PSB	412A	June
B	Sx (Bl)	1+0	PSB	412A	June

A,B,C

1) Manage for a mixed species stand of preferred and acceptable species to the extent possible. Note that species selection is limited due to the upper elevation and cool aspect location, and high snowfall levels. **Sx** and **Bl** are the species most suited to this site. A minor amount of **Cw** (suggest <10%) could also be planted in SU A and C for stand diversity.
2) **Sx** may account for up to **100%** of planting stock due to the upper elevation, cool aspect, and high snow levels. Expect some natural Bl (Cw Hw) regeneration.
3) On steeper slopes, plant trees on the uphill or downhill side of stumps to help minimize snow creep and snow press.
4) Expect low to moderate levels of **Bl Sx (Hw Cw) natural regeneration**.
5) 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.
6) In wet areas, target trees to elevated microsites.
7) Monitor for signs of **ungulate browsing** during silviculture surveys.

H.5 BRUSHING

SU	PREFERRED	ALTERNATE
A,B,C	- Manual brushing with hand tools or power saws.	- None

Current Brush Hazard:

SU A,B,C: High levels of brush inside harvest boundaries (continuous rhododendron, and patchy thimbleberry, Utah honeysuckle, Vaccinium spp, alder, ash, devils club and lady fern).

Future Brush Hazard:

SU A,B,C: Future hazard is **High** due to mesic to subhygric moisture conditions, cool aspect, and established vegetation on site.

Competitor species: Potential competitor species include rhododendron, thimbleberry, Utah honeysuckle, huckleberry, alder, ash, lady fern, and devils club. Competing species are already established within and adjacent to the block.

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.

	Standards Units					
	A	**B**	**C**		**TOTAL HA**	**%**
HAZARD RATINGS:						
Compaction	High	High - Very High	High			
Soil Displacement	Moderate (12)	Moderate (14)	Moderate (10)			
Surface Erosion	High (31)	High-Very High (26-32)	Very High (33)			
Forest Floor Displacement	High(17)	Moderate-High (14-17)	Low (5)			
Mass Wasting	High (39)	Moderate – High (38-41)	High (49)			
Harvest System	Conventional	Conventional	Conventional			
TOTAL AREA	9.7	29	3.8		42.5	
Wildlife Tree Patches / Other Reserves						% WTP/RES
WTRA	2.3	-	-		2.3	5.4
Other Reserve	-	3.6	-		3.6	8.5
Permanent Access Structures						% Disturbance
Proposed roads	0.3	1.0	-		1.3	3.1
Existing roads	-		-		-	-
Landings	-					
Total disturbance permanent access structures	**0.3**	**1.0**	**-**		**1.3**	**3.1**
NET AREA TO BE REFORESTED	**7.1**	**24.4**	**3.8**		**35.3**	
Sensitive Soils (Y/N)	No	Yes	Yes			
Temporary Access Structures: Road, landing, excavated or bladed trails that will be rehabilitated (% of NAR).	5% (excavated/bladed trails)	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%	5%	5%			

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: 1089.4m x 12m = **1.3 ha**

Temporary Roads:

Spur 1-1 = 60m x 10m = **0.06 ha**
Spur 1-3 = 593m x 10m = **0.59 ha**
Spur 1-4 = 90m x 10m = **0.09 ha**
Spur 1-5 = 89m x 10m = **0.09 ha**
Spur 1-6 = 78m x 10m = **0.08 ha**

Temp Landings: 7 landings utilizing new access structures, one landing utilizing existing access structure. Two 0.2 ha landings within SU A NAR, four 0.2 ha landings within SU B NAR, and one 0.2ha landing within SU C NAR.

See **Section F.4** for discussion of rehabilitation of excavated/bladed trails.